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MORTON BAY GEOTHERMAL PROJECT

Preliminary Staff Assessment

June 2024
CEC-700-2024-003-PSA

CALIFORNIA
ENERGY
COMMISSION
Gavin Newsom, Governor

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PRELIMINARY STAFF ASSESSMENT

Morton Bay Geothermal Project

(23-AFC-01)

Lead Agency

California Energy Commission

June 2024

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Section 1

Executive Summary

1 Executive Summary

Introduction

On April 18, 2023, Morton Bay Geothermal, LLC, an indirect, wholly owned subsidiary of BHE Renewables, LLC (BHER) (Applicant) filed an application for certification (AFC) (TN 249723) with the California Energy Commission (CEC) to construct and operate the Morton Bay Geothermal Project (MBGP or project). On May 31, 2023, the CEC determined the project met the requirements of Public Resources Code section 25540.2(a) and that filing of a Notice of Intent (NOI) was not required because the applicant demonstrated, based on evidence in the record, the project's capability to provide geothermal resources in commercial quantities. On July 27, 2023, the CEC accepted the AFC as a complete filing (TN 251219), thereby commencing the certification process. The MBGP is proposed in the Salton Sea Known Geothermal Resource Area (KGRA), in Imperial County, south of the Salton Sea. The project would be in an agricultural area approximately six miles northwest of the town of Calipatria. The project would consist of a 157-megawatt (MW) (140 MW net) electricity generating facility powered by steam sourced from super-heated geothermal brine. The MBGP would provide electricity via a new 3.2-mile transmission line to deliver power to a new Imperial Irrigation District (IID) switching station to be built adjacent to the proposed Elmore North Geothermal project site, under the same ownership.

This Staff Assessment (SA) has been prepared by the California Energy Commission (CEC) staff to evaluate the potential environmental effects of the construction and operation of the MBGP (23-AFC-02), in compliance with the California Environmental Quality Act (CEQA), the CEQA Guidelines, the Warren-Alquist Act, and California Code of Regulations, Title 20. The SA also evaluates whether the construction and operation of the project would conform with all applicable local, state, and federal laws, ordinances, regulations and standards (LORS).

This SA contains CEC staff's independent and objective evaluation of the proposed project and examines engineering, environmental, public health and safety, and environmental justice aspects of the proposed project, based on the information provided by the applicant, government agencies, interested parties, independent research, and other sources available at the time the SA was prepared.

Determinations of LORS conformance are made through the CEC staff's active coordination with other regulatory agencies and incorporation of their findings, such as the Imperial County Air Pollution Control District (ICAPCD) and its Preliminary Determination of Compliance, filed on February 2, 2024 (TN 254307). The result of staff's research, collaboration, and comprehensive process of discovery and analysis are recommendations for mitigation requirements to reduce to less than significant any significant adverse environmental effects resulting from the proposed project and to ensure project compliance with applicable LORS.

1.1 Proposed Project Location

The proposed project is entirely within the northern portion of unincorporated Imperial County on the southeastern shore of the Salton Sea. The town of Niland is approximately four miles to the northeast. The Sonny Bono National Wildlife Refuge headquarters is roughly 2.5 mile from the project. The primary geothermal generating facility site is on approximately 51 acres of a 160-acre parcel, which is bounded by McDonald Road to the north, Davis Road to the east, Schrimpf Road to the south, and the Salton Sea to the immediate west. Other project elements are proposed to be shared by other geothermal projects under construction by the project owner and are within five miles of the generating facility.

1.2 Summary of Engineering Evaluation, Environmental Impact Assessment, and LORS Conformance

Below is an overview of the analysis included in Section 5 Environmental Setting, Environmental Impacts and Mitigation. Impacts are categorized by the type of impact as follows:

- No Impact. The scenario in which no adverse changes to (or impacts on) the environment would be expected.
- Less Than Significant Impact. An impact that would not exceed the defined significance criteria or would be eliminated or reduced to a less than significant level through implementation of the applicant's project measures and/or compliance with existing federal, state, and local laws and regulations.
- Less Than Significant with Mitigation Incorporated. An impact that would be reduced to a less than significant level through implementation of the identified mitigation requirements.
- Significant and Unavoidable Impact. An adverse effect that meets the significance criteria, but there appears to be no feasible mitigation available that would reduce the impact to a less than significant level. In some cases, mitigation may be available to lessen a given impact, but the residual effects of that impact would continue to be significant even after implementation of the mitigation measure(s).

Table 1-1 summarizes the engineering evaluation and environmental impacts and consequences of the project, including mitigation proposed and the project's compliance with laws, ordinances, regulations, and standards (LORS).

TABLE 1-1 SUMMARY OF ENGINEERING EVALUATION AND ENVIRONMENTAL IMPACTS AND LORS COMPLIANCE

Technical Area	Complies with LORS?	Impacts Mitigated?	Information Needed?
Engineering Evaluation			
Facility Design	Yes	N/A	No
Facility Efficiency and Energy	Yes	N/A	No

TABLE 1-1 SUMMARY OF ENGINEERING EVALUATION AND ENVIRONMENTAL IMPACTS AND LORS COMPLIANCE

Technical Area	Complies with LORS?	Impacts Mitigated?	Information Needed?
Facility Reliability	N/A	N/A	No
Transmission System Engineering	Yes	Yes	No
Worker Safety and Fire Protection	Yes	Yes	No
Environmental Impact Assessment			
Air Quality	Yes	Yes	No
Biological Resources	Yes	Yes	No
Climate Change and Greenhouse Gas Emissions	Yes	N/A	No
Cultural and Tribal Cultural Resources	Yes	No (Sig/Un)	No
Geology, Paleontology and Minerals	Yes	Yes	No
Hazards, Hazardous Materials/Waste, and Wildfire	Yes	Yes	No
Land Use, Agriculture, and Forestry	Undetermined	Yes	Yes
Noise and Vibration	Yes	Yes	No
Public Health	Yes	Yes	No
Socioeconomics	Yes	Yes	No
Transmission Line Safety and Nuisance	Yes	Yes	No
Solid Waste Management	Yes	Yes	No
Transportation	Yes	Yes	No
Visual Resources	Yes	Yes	No
Water Resources	Yes	Yes	No
Environmental Justice	N/A	Yes	No

N/A = not applicable (technical area not subject to CEQA consideration or has no applicable LORS the project must comply with.

1.2.1 Engineering Evaluation and LORS Conformance

Facility Design. Staff concludes that the design, and construction of the project, including the geothermal generating facility, its linear facilities, including transmission lines, water pipelines, conveyance pipelines, and wellfield, would comply with the applicable LORS. In addition, staff proposed conditions of certification (COCs) include measures to ensure conformance with applicable LORS.

Facility Efficiency and Energy. Energy consumed by MBGP would not create significant adverse effects on energy supplies or resources, nor would it consume energy in a wasteful or inefficient manner. Furthermore, through energy-efficient design and increased renewable electricity generation, the project would neither conflict with nor obstruct state or local plans for renewable energy or energy efficiency and, therefore, would have no impact on those plans.

Facility Reliability. MBGP would be built to operate in a manner consistent with industry norms for reliable operation and would be expected to demonstrate an equivalent

availability factor of 95 percent, which is an acceptable level of availability. The proposed geothermal power plant would perform reliably and would not adversely affect project reliability.

Transmission System Engineering. With the IID network upgrade and implementation of Transmission System Engineering COCs and mitigation measures, the project would be reliably and safely interconnected to the transmission grid, thereby reducing impacts to less than significant.

Worker Safety and Fire Protection. Staff concludes that the proposed project would incorporate sufficient measures to ensure adequate levels of industrial safety and comply with applicable LORs. In addition, staff proposed COCs include measures that would ensure worker safety and fire protection and conformance with applicable LORS.

1.2.2 Environmental Impact Assessment and LORS Conformance

Staff concludes that with the implementation of the conditions of certification for the jurisdictional portion of the project, and mitigation measures for portions of the project not subject to CEC licensing authority, presented in the SA, potentially significant impacts would be avoided or reduced to less than significant levels, except for impacts to Cultural and Tribal Cultural Resources which would be significant and unavoidable. In addition, staff concludes, the project would conform with all applicable LORS, except in land use where a conformance determination is pending. The following summarizes staff's conclusions.

Air Quality. Less Than Significant with Mitigation Incorporated. With implementation of Air Quality COCs and mitigation measures (MMs), potential identified air emissions from the project, including criteria pollutants from plant operations and other site activities as well as diesel-fired emergency backup generators, would have a less than significant impact, and the project would comply with all applicable LORS.

Biological Resources. Less Than Significant with Mitigation Incorporated. The project would not have any impact on federal or state listed plants but may impact federal or state listed fish and wildlife and other special status species, including Yuma Ridgway's rail, burrowing owl, desert pupfish, and migratory birds using the Salton Sea area along the Pacific Flyway. With implementation of staff's recommended COCs and MMs, the project would have a less than significant impact related to biological resources and would conform with applicable LORS.

Climate Change and Greenhouse Gas Emissions. Less Than Significant Impact. The project would lead to a net reduction in greenhouse gas emissions across the State's electricity system, and the greenhouse gas emissions related to the project would not conflict with any plans, policies, or regulations adopted for the purpose of reducing the emissions of greenhouse gases. The project would therefore have less than significant greenhouse gas-related impacts to the environment.

Cultural and Tribal Cultural Resources. Significant and Unavoidable. The project would have significant and unavoidable impacts to cultural and tribal cultural resources, related to visual impacts to an identified cultural district and to sensitive cultural features (mud pots and mud volcanos), but would conform with applicable LORS. With implementation of staff's proposed COCs and MMs, many of the proposed project's impacts on cultural and tribal cultural resources would be less than significant or reduced to the extent possible. However, significant and unmitigable impacts to cultural and tribal cultural resources would remain.

Geology, Paleontology, and Minerals. Less Than Significant Impact to Less Than Significant Impact with Mitigation Incorporated. The impacts of applicable geologic hazards would be mitigated through project design to existing site conditions based on the results of a site-specific geotechnical investigation and the California Building Code. Potential impacts to paleontological resources would be addressed by on-site monitoring during project construction. Mineral resources would not be expected to be encountered during project construction; therefore, impacts are reduced to less than significant.

Hazards, Hazardous Materials/Waste, and Wildfire. Less Than Significant with Mitigation Incorporated. With implementation of staff's proposed COCs and MMs, the proposed project would comply with applicable LORS and have less than significant impacts related to hazards, hazardous materials/waste and wildfire. Potential impacts from the storage and use of common hazardous substances, and from the potential for contamination of groundwater are reduced to less than significant as a result thereof.

Land Use, Agriculture, and Forestry. Less Than Significant with Mitigation Incorporated. The project would result in the loss of approximately 6.25 acres of Farmland of Statewide Importance. However, with implementation of staff's recommended COCs, the project would have a less than significant impact related to land use, agriculture and forestry and would conform with applicable LORS. Staff's recommended COCs would require the project owner to implement farmland mitigation measures, including those detailed in Imperial County's Mitigation Monitoring and Reporting Program in the Final Programmatic Environmental Impact Report for the Imperial County Renewable Energy and Transmission Element Update. Staff's recommended COCs would also ensure compliance with LORS by requiring the project owner to submit to the CPM conditional use permits for project elements under Imperial County regulation, and to submit Imperial County review comments for project elements under CEC jurisdiction. (See Section 3.1, Project Description, for a discussion about jurisdiction). Staff determined that the project meets Imperial County's conditional use permit and variance findings for the parts of the project under CEC jurisdiction, including the atmosphere flash tanks which exceed Imperial County's height limitation.

The project is located in military airspace areas. Until staff receives project review comments from the Department of Defense, the project's conformance with Goal 6 of the Imperial County General Plan, "Support development of renewable energy while providing for the protection of military aviation and operations", is undetermined.

Noise and Vibration. Less Than Significant with Mitigation Incorporated. Despite the generation of noise louder than ambient levels, such as from pile driving and other construction activities, and noisy steam blows during operations, with implementation of staff's recommended COCs, the project would have a less than significant impact related to noise and vibration and would conform with applicable LORS.

Public Health. Less Than Significant with Mitigation Incorporated. With implementation of Air Quality and Public Health COCs and mitigation measures, the project would comply with all applicable LORS. Public health impacts of the project would be less than significant.

Socioeconomics. Less Than Significant Impact. The construction and operation of MBGP would have a less than significant impact related to socioeconomics. Staff's proposed COC **SOCIO-1** would ensure payment of school impact fees in conformance with LORS.

Solid Waste Management. Less Than Significant Impact. Solid waste produced during project construction and operation would be recycled if possible and otherwise disposed at certified local landfills with available capacity. In conclusion, wastes generated by the proposed project, including those sent to landfills, as well as materials handled by third party waste disposal resulting from construction and operation of MBGP would have a less than significant impact.

Transmission Line Safety and Nuisance. Less Than Significant with Mitigation Incorporated. With implementation of staff's recommended COCs, potential hazards and impacts to receptors associated with transmission lines and related structures and facilities for the project would have a less than significant impact related to Transmission Line Safety and Nuisance and would conform with applicable LORS.

Transportation. Less Than Significant with Mitigation Incorporated. Implementation of staff's recommended COCs to mitigate impacts associated with increased construction traffic, primarily volume and frequency, by applying roadway improvements, would reduce impacts of the project to less than significant. Impacts related to transportation would conform with applicable LORS.

Visual Resources. Less Than Significant with Mitigation Incorporated. Implementation of staff's recommended COCs would mitigate potential offsite light pollution and reflectance to a less than significant effect on the environment for "Aesthetics" in accordance with the CEQA Guidelines and would bring the project into conformance with identified LORS pertaining to landscaping and lighting per Public Resources Code section 25525.

Water Resources. Less Than Significant Impact with Mitigation Incorporated. Impacts due to stormwater runoff will be mitigated by adherence to the NPDES Construction General Permit administered by the California State Water Resources Control Board

during project construction and a Drainage, Erosion, and Sedimentation Control Plan during project operation. Possible impacts of discharges to land from the brine pond will be addressed by compliance with waste discharge requirements (WDRs) prepared in coordination with the Colorado River Basin Regional Water Quality Control Board. All water for the project would be supplied by the Imperial Irrigation District (IID). In response to concerns raised by CEC staff regarding IID's ability to reliably provide 13,165 AFY for all three geothermal projects, IID has given assurance to CEC staff that IID has the necessary confidence and management history that they can reliably supply the water needed for these projects.

Environmental Justice. Less Than Significant with Mitigation Incorporated. The following technical areas discuss impacts to EJ populations: Air Quality; Cultural and Tribal Cultural Resources; Hazards, Hazardous Materials/Waste, and Wildfire; Land Use, Agriculture, and Forestry; Noise and Vibration; Public Health; Socioeconomics; Solid Waste Management; Transportation; Visual Resources; and Water Resources. The impact of these technical areas on the EJ populations represented in Figure 6-1, Figure 6-2, and Table 6-2 would be less than significant or less than significant with implementation of staff's recommended COCs and would not fall disproportionately on identified EJ populations.

1.3 Cumulative Projects

Preparation of a cumulative impact analysis is required under CEQA. In the CEQA Guidelines, "a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts" (Cal. Code Regs., tit. 14, § 15130(a)(1)). Cumulative impacts must be addressed if the incremental effect of a project, combined with the effects of other projects, is "cumulatively considerable" (Cal. Code Regs., tit. 14, § 15130(a)). Such incremental effects are to be "viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects" (Cal. Code Regs., tit. 14, § 15064(h)(1)). Together, these projects comprise the cumulative scenario which forms the basis of the cumulative impact analysis.

The discussion of cumulative impacts must reflect the severity of impacts, as well as the likelihood of their occurrence, yet "the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion of cumulative impacts shall be guided by standards of practicality and reasonableness, and shall focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact" (Cal. Code Regs., tit. 14, § 15130(b)).

Definition of the Cumulative Project Scenario

The cumulative impacts analysis is intended to identify past, present, and probable future projects that are closely related either in time or location to the project being considered and consider how they have harmed or may harm the environment. Most of the projects

on the master cumulative project list below (**Table 1-2**) are required to undergo their own independent environmental reviews under CEQA. Staff developed the master cumulative project list by contacting planning staff with Imperial County. Staff also reviewed proposed project information from other agencies, including Imperial County Planning Department, Bureau of Land Management, and the CEQANet database to develop a list of past, present, and reasonably foreseeable projects.

Under CEQA, there are two commonly used methodologies for establishing the cumulative impact setting or scenario: the "list approach" and the "projections approach." The first approach would use a "list of past, present, and probable future projects producing related or cumulative impacts." (Cal. Code Regs., tit. 14, § 15130(b)(1)(A)). The second approach is to use a "summary of projections contained in an adopted local, regional or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect" (Cal. Code Regs., tit. 14, § 15130(b)(1)(B)). This SA uses the "list approach" for purposes of state law to provide a tangible understanding and context for analyzing the potential cumulative effects of the proposed project. All projects used in the cumulative impacts analyses are listed in the master cumulative project list table (**Table 1-2**), and locations are shown on **Figure 1-1**.

Approach to Cumulative Impact Analysis

This SA evaluates cumulative impacts within the analysis of each resource area, following three steps:

- Define the geographic scope of cumulative impact analysis for each discipline, based on the potential area within which impacts of the proposed project could combine with those of other projects.
- Evaluate the effects of the project in combination with past and present (existing) projects within the area of geographic effect defined for each discipline.
- Evaluate the effects of the proposed project with foreseeable future projects that occur within the area of geographic effect defined for each discipline.

TABLE 1-2 MASTER CUMULATIVE PROJECT LIST

Project Title	Description	Location	Distance to Proposed Project (Miles)	Status
Black Rock Geothermal Project	The project is proposed to be developed by Black Rock Geothermal, LLC, an indirect, wholly owned subsidiary of BHE Renewables. The project would have a maximum continuous rating of approximately 87 megawatts (MW) gross, with an expected net output of roughly 77 MW.	Imperial County	3.0 miles SW of MBGP	Pending Permit
Elmore North Geothermal Project	The project is proposed to be developed by Elmore North Geothermal, LLC, an indirect, wholly owned subsidiary of BHE Renewables, LLC. The project would have a maximum continuous rating of approximately 157 MW gross, with an expected net output of roughly 140 MW	Imperial County	1.3 miles SW of MBGP	Pending Permit
Energy Source Mineral ATLIS Project	Construct and operate a commercial lithium hydroxide production plant within the Salton Sea geothermal field in Imperial County. The facility will process geothermal brine from the neighboring HR1 to produce lithium hydroxide as well as zinc and manganese products which would be sold commercially	Imperial County, APNs 020-100-025, 020-100-044, 020-100-046	0.4 miles E of MBGP	Pending Construction
Geo Hudson Ranch (HR1)	Project consists of a well pad, a geothermal well, a pipeline that would connect the geothermal well to the existing geothermal power plant, and an access road to the well pad as well as an access road generally along the pipeline extent	McDonald Rd and Davis Rd	0.5 miles E of MBGP	Approved
Hell's Kitchen	Project is the construction of up 4 well pads, wells, move on areas, and use rig mats to access the well pads for geothermal exploration.	4 miles west of Niland, southwest of the intersection of Davis Road and Noffsinger Road	1.2 miles N of MBGP	Entitlement Process
Midway IV	20 MW solar project	Calipatria	3.7 miles SE of MBGP	Approved-Not Built
Calipal Solar Farm I (Wilkinson solar farm)	Construct a 30-MW alternating current (AC) solar photovoltaic (PV) energy generating facility on approximately 223 acres of land owned by IID. Of the	Calipatria	5.8 miles SE of MBGP	Approved

TABLE 1-2 MASTER CUMULATIVE PROJECT LIST

Project Title	Description	Location	Distance to Proposed Project (Miles)	Status
	total 223 acres, approximately 159 acres (area within the fence line) would be developed with a ground mounted PV solar power generating system, supporting structures, on-site substation, access driveways, and transmission structures. Approximately 12.02 acres is currently developed with the Midway Substation			
Nidar	100 MW solar project	Calipatria	6.4 miles SE of MBGP	Pending Entitlement
Wister Solar Energy Facility Project (Ormat Wister)	Construction and operation of a 20 MW PV solar energy facility on approximately 100 acres of privately-owned land north of Niland. The proposed project would be comprised of solar PV panels on single-axis horizontal trackers, an on-site substation and inverters, transformers, and underground electrical cables. The proposed project also includes approximately two miles of fiberoptic line from the proposed on-site substation to the existing Niland Substation to connect the proposed Wister Substation to the region's telecommunications system	8601 Wilkins Road, Niland	6.8 miles NE of MBGP	Proposed-Under Construction
VEGA SES 2, 3, and 5 Solar Energy Project	Construct and operate a PV solar energy facility and associated infrastructure on approximately 1,963 acres of privately-owned land in the unincorporated area of Imperial County	Niland	8.5 miles E of MBGP	Approved-Not Built

Figure 1-1
Cumulative Projects

Sources: Draft EIR for the Energy Source Mineral ATLiS Project, Hudson Ranch Power II Geothermal Project Water Supply Assessment, Imperial County Renewable Energy Overlay and Plant Location Map

1.4 Summary of Alternatives to the Project

CEQA requires that an EIR consider and discuss alternatives to the project. CEQA Guidelines section 15126.6(a) states that an EIR must describe a "reasonable range of potentially feasible alternatives," focusing on those that "would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project.…" The CEQA regulations also apply to the document used in place of an EIR in a certified regulatory program, including the CEC's site certification program.

Staff considered the feasibility of alternative power plant cooling technologies to reduce the MBGP's water consumption. Cooling technology alternatives initially considered by staff were not fully evaluated, primarily due to feasibility issues and an inability to attain most of the basic project objectives.

Other properties in the project area were evaluated as possible alternative sites for the MBGP before being rejected due to greater environmental impacts and related construction challenges, site control issues, and an inability to meet the project objectives. A reduced capacity version of the MBGP was considered by staff and rejected due to an inability to substantially lessen any of the significant impacts evaluated in this SA. No project alternatives were fully analyzed and compared to the project because none are known that could feasibly attain the project objectives while avoiding or substantially lessening any of the project's significant impacts.

CEQA requires that a "no project" alternative be evaluated. For the MBGP, under the No Project/No Build Alternative, no development of the project site would occur. The applicant might continue to pursue development of a different geothermal power facility on its property. However, the design, potential impacts, and time frame concerning a future project would be subjects of speculation. The project site property is undeveloped, and under the No Project/No Build Alternative, existing conditions would continue at the site for an unknown period. This alternative is the environmentally superior alternative because it would avoid all impacts of the project. If the MBGP were not implemented, the project objectives would not be attained.

1.5 Issues to be Resolved

As noted above, and detailed in **Section 5.8 Land Use, Agriculture, and Forestry**, until staff receives project review comments from the Department of Defense, the project's conformance with Goal 6 of the Imperial County General Plan, "Support development of renewable energy while providing for the protection of military aviation and operations," is undetermined. Staff concluded that all potentially significant impacts can be mitigated to a less than significant level. There are no remaining environmental or engineering issues to be resolved.

Staff is coordinating with the Colorado River Basin Regional Water Quality Control Board, Region 7, to develop waste discharge requirements (WDRs) applicable to the proposed

project, implementation of which will reflect compliance with the board's requirements. The current draft slate of WDRs will be finalized for inclusion in the final staff assessment.

The MBGP is located near the existing Hudson Ranch geothermal facility. The facility owner, Cyrq, raised concerns in multiple filings that the operations of the MBGP and specifically where MBGP plans to locate its production wells will impact Hudson Ranch's wells and ultimately reduce the facility's power output. (See the following filings by Hudson Ranch, TN 256821, TN 255704, and TN 254691.) As detailed in Section 5.5, Efficiency and Energy Resources, staff reviewed the information provided by Cyrq and responsive information submitted by the applicant as well as consulted with CalGEM. While this potential well interference is not specifically an environmental impact under CEQA, staff found compelling evidence in the record supporting the applicant's position that operations of MBGP would not cause the impacts to the Hudson Ranch facility suggested by Cyrq. To the extent there is continued concern by Cyrq, staff recommends BHER and Cyrq continue any discussions on well placement to reach mutual resolution.

Section 2

Introduction

2 Introduction

2.1 Purpose of the Staff Assessment

The purpose of this Staff Assessment is to provide objective information regarding the Morton Bay Geothermal Project's (MBGP) significant effects on the environment, identify possible ways to minimize the significant effects, describe reasonable alternatives to the project, and assess the project's conformance with applicable local, state, and federal laws, ordinances, regulations, and standards. This information will be considered by the Committee of two California Energy Commission (CEC) Commissioners assigned to this proceeding in deciding whether to recommend the CEC grant a certificate to build and operate the MBGP. The Staff Assessment is based on information from the application for certification (AFC) and associated submittals, site visits, data requests and responses, and additional staff research, including consultation with other agencies, such as responsible and trustee agencies, and relevant information received during any public meetings.

2.2 California Energy Commission Application for Certification Process

The CEC has the exclusive authority to certify the construction, modification, and operation of thermal electric power plants 50 megawatts (MW) or larger (and related facilities) in California. The CEC certification is in lieu of any permit required by state, regional, or local agencies, and federal agencies to the extent permitted by federal law, for use of the site and related facilities, and supersedes any applicable statute, ordinance, or regulation of any state, local, or regional agency, or federal agency to the extent permitted by federal law (Pub. Resources Code, § 25500). The CEC must review thermal power plant AFC to assess potential environmental, public health and safety impacts, engineering assessment related to facility efficiency, health and safety and potential measures to mitigate those impacts and ensure compliance with applicable governmental laws or standards (Pub. Resources Code, § 25519 and § 25523(d)).

The CEC's siting regulations require staff to review the proposed project, assess whether the potential environmental impacts have been properly identified, and whether the applicant's proposed mitigation or other, more effective, mitigation measures are necessary, feasible, and available (Cal. Code Regs., tit. 20, § 1742). Additionally, staff is required to assess the adequacy of the measures proposed by the applicant to ensure the assessment evaluates the safety and reliability of the project, (Cal Code Regs., tit. 20 part 1742(b). Staff is required to develop a compliance plan (coordinated with other agencies) to ensure that applicable laws, ordinances, regulations, and standards (LORS) are met and adhered to (Cal. Code Regs., tit. 20, § 1744(b)).

The CEC's power plant site certification program has been certified by the Secretary of the California Natural Resources Agency as meeting all requirements of a certified

regulatory program (Pub. Resources Code, § 21080.5 and Cal. Code Regs., tit. 14, § 15251 (j)), constituting an environmental analysis in accordance with the requirements of the California Environmental Quality Act (CEQA). The CEC is the lead agency. No additional environmental impact report (EIR) is required.

CEC staff prepares a preliminary staff assessment (PSA) that presents staff's initial analyses, conclusions, and recommendations to the applicant, intervenors, agencies, California Native American tribes, interested parties, and members of the public. Where it is appropriate, the PSA incorporates comments received from agencies, the public, parties to the siting case, and comments made at public meetings.

Following the publication of the PSA, CEQA regulations establish a 45-day public comment period (Cal. Code Regs., tit. 14, Section 15105(a)), consistent with Pub. Resources Code, § 21091(a) (amended, Ch.97, Statutes 2021) for environmental impact reports submitted to the State Clearinghouse. The PSA is circulated for agency and public review, posted to the project's CEC docket, and distributed to those on the project's subscription list. The subscription list is an automated CEC system by which information about this proceeding is emailed to persons who have subscribed.

The comment period is used to: 1) solicit input on the staff analysis; 2) resolve issues between parties to the siting case; and 3) where consensus on issues exists, narrow the scope of issues to be adjudicated in subsequent evidentiary hearings. During the public comment period, staff will notice and conduct a workshop to give the parties, agencies, tribes, and public the opportunity to discuss the conclusions, proposed mitigation, and verification measures in the staff assessment. Based on the workshop dialogue and the written comments received, staff may refine its analyses, correct errors, and modify its proposed conditions of certification. These revisions and changes will be presented in the final staff assessment (FSA). The FSA will be distributed as described in the previous paragraph for the PSA.

The FSA is only one piece of evidence that will be considered by the Committee in reaching a decision on whether to recommend that the full Energy Commission certify the proposed project. At the public evidentiary hearings, all formal parties will be afforded an opportunity to present evidence and to rebut the testimony of other parties, thereby creating a hearing record on which a decision on the project can be based. The hearing before the Committee also allows all parties to present their positions on disputed matters, if any, and provides a forum for the Committee to receive comments from agencies, tribes, and the public.

Following the hearings, the Committee's recommendation to the full Energy Commission on whether to approve the proposed project, and under what set of conditions, will be contained in a document entitled the Presiding Member's Proposed Decision (PMPD). Following its publication, the PMPD is circulated for written public comments. At the conclusion of that comment period, the Committee may prepare a revised PMPD. At the close of the comment period for the PMPD, or a revised PMPD if there is one, the PMPD

or revised PMPD is submitted to the full Energy Commission for final consideration and a decision.

2.3 Agency Coordination

As noted above, the CEC decision (certification) is in lieu of any permit required by state, regional, or local agencies and federal agencies to the extent permitted by federal law for use of the site and related facilities, and supersedes any applicable statute, ordinance, or regulation of any state, local, or regional agency, or federal agency to the extent permitted by federal law (Pub. Resources Code, § 25500). However, the CEC staff seeks comments from, and works closely with, other regulatory agencies that administer LORS that are applicable to proposed projects. In accordance with California Code of Regulations, Title 20, section 1714, staff provided notification of the Morton Bay Geothermal Project AFC to stakeholder agencies via an Agency Request for Participation letter, which was sent to appropriate agencies on August 1, 2023. These agencies included, United States (U.S.) Army Corps of Engineers (Region 9 Office), U.S. Fish and Wildlife Service (including the Carlsbad Office), Joint Forces Training Base, Native American Heritage Commission, California Independent System Operator (California ISO), California Department of Fish and Wildlife, California Air Resources Board, California Office of Historic Preservation, California Division of Energy Management (CalGEM), the California State Water Resources Control Board, Imperial County, Imperial County Air Pollution Control District, and Imperial Irrigation District. The mailing list used to engage with stakeholder agencies can be found in **Appendix E**.

2.4 Consultation with Tribes

CEC staff sent letters to California Native American tribes on a Native American Heritage Commission (NAHC) list of tribes identified as having cultural affiliation in the project vicinity and interested in consulting on development projects in the project area. Following receipt of the NAHC response to the CEC solicitation on May 3, 2023, letters were mailed to 31 individuals among 18 identified Native American tribes on August 1, 2023, August 8, 2023, and August 18, 2023. Emails were also sent to the tribes. The letters and emails invited the tribes to comment on the proposed project and offered to hold face-to-face consultation meetings if any were requested. CEC staff received the following responses/requests:

- Agua Caliente responded via letter on September 29, 2023.
- Kwaaymii Laguna submitted a consultation request on September 5, 2023.
- The Ewiiaapaayp Band responded via letter on September 7, 2023, with support for the project.
- The Quechan Tribe responded by letter on September 29, 2023, requesting consultation.
- The Viejas Band responded by email on September 7, 2023, deferring consultation to tribes nearer to the project site.

Finally, CEC staff has had numerous email exchanges, Zoom meetings, and three in-person field visits with members of the Kwaaymii, Agua Caliente, and Quechan tribes. Follow-up phone calls were made with all tribes from whom staff did not receive a response. As of the date of publication of this PSA, staff has not received any additional responses. More detail on CEC staff's consultation efforts with California Native American tribes can be found in **Section 5.4 Cultural and Tribal Cultural Resources**.

2.5 Public Outreach and Notification

The CEC's public outreach program is primarily facilitated by the CEC's Office of the Public Advisor, Energy Equity, and Tribal Affairs. The Public Advisor's Office contacted local elected officials, interested parties, agencies, and school districts. The Committee conducted an Informational Hearing and Site Visit on August 31, 2023, the public notice for which was distributed on August 9, 2023. This is an ongoing process, and efforts are discussed in greater detail in the **Environmental Justice** section of this staff assessment.

As specified in California Code of Regulations, Title 20, section 1713(a), staff prepared a summary of the MBGP AFC, which included a description of the CEC's procedures for an AFC proceeding. This summary, called a "Notice of Receipt" was sent on August 7, 2023, to public libraries in the communities near the proposed site (El Centro-Imperial County Library) as well as libraries in Eureka, Fresno, Los Angeles, San Diego and San Francisco; and to all members, to the ex officio members, to the public adviser, to the hearing officer, to the general counsel, to the applicant, to any person who requests such mailing or delivery, and to all parties to the proceeding (Cal. Code Regs, tit. 20, § 1713(b)). As required by section 1713(c), the summary was published in a newspaper of general circulation in the county of the project site. The summary was published in the Imperial Valley Press (English and Spanish) on August 4, 2023, and La Prensa (Spanish) on August 10, 2023.

In addition to the required noticing set forth in sections 1713 and 1714, staff sent the Notice of Receipt on August 1, 2023, via the U.S. Postal Service to adjacent occupants and property owners within 1,000 feet of project site and 500 feet of project linears (for example, sewer, natural gas, water, transmission line connections). The notice pointed recipients to the project webpage and included instructions on how to sign up for the project subscription list to receive electronic notification of events and the availability of documents related to the AFC proceeding. The relevant mailing lists staff used for outreach, to engage stakeholders, and to satisfy the requirements of section 1713 (b) can be found in **Appendix E**.

2.6 Organization of this Staff Assessment

The Staff Assessment is prepared to conform to the requirements of CEQA, the CEQA Guidelines (California Code of Regulations, title 14, section 15000 et seq.), the Warren-Alquist Act (Public Resources Code, section 25000 et seq.), and CEC's siting regulations (California Code of Regulations, title 20, section 1701 et seq.).

This Staff Assessment is organized into nine sections, as described below:

- Section 1 Executive Summary. This section provides an overview of the proposed project; a list of cumulative projects; the environmental impacts that would result from the proposed project; conditions of certification identified to reduce or eliminate these impacts; project alternatives; and issues to be resolved.
- Section 2 Introduction. This section describes the CEC's authority and function of the Staff Assessment; the environmental review process; and the organization of the Staff Assessment.
- Section 3 Project Description. This section summarizes the proposed project, including the location of the site and project boundaries, characteristics of the proposed project, and objectives sought by the proposed project.
- Section 4 Engineering Evaluation. This section evaluates the applicant's proposed design criteria, describes the design review and construction inspection process, and establishes conditions of certification that would monitor and ensure compliance with engineering LORS and any other special design requirements.
- Section 5 Environmental Setting, Environmental Impacts and Mitigation. This section includes the environmental setting; regulatory background; approach to analysis; project-specific and cumulative impacts; and mitigation measures, when appropriate. Staff evaluates the potential environmental impacts that might reasonably be anticipated to result from construction and operation of the proposed project. Staff's analysis is broken down into the following environmental resource topics derived from CEQA Appendix G, in addition to engineering assessment sections in response to Warren Alquist requirements:

  - Air Quality
  - Alternatives
  - Biological Resources
  - Climate Change and Greenhouse Gas Emissions
  - Cultural and Tribal Cultural Resources
  - Efficiency and Energy
  - Environmental Justice
  - Facility Design
  - Geology and Paleontology
  - Hazards, Hazardous Materials/Waste, and Wildfire
  - Land Use, Agriculture, and Forestry
  - Noise and Vibration
  - Public Health
  - Reliability
  - Socioeconomics
  - Solid Waste Management
  - Transmission Line Safety and Nuisance
  - Transmission System Engineering
  - Transportation
  - Visual Resources
  - Water Resources
  - Worker Safety and Fire Protection

For each subject area, the analysis includes a description of the existing conditions and setting related to the subject area, an analysis of the proposed project's potential environmental impacts, and a discussion of mitigation measures and conditions of certification, if necessary, to reduce potentially significant impacts to less than significant levels and ensure conformance with LORS.

- Section 6 Environmental Justice. This section includes an analysis of how the project would potentially impact an Environmental Justice[1] population.
- Section 7 Public Benefits. This section includes a discussion of any public benefits from the project including, but not limited to, economic benefits, environmental benefits, and electricity reliability benefits.
- Section 8 Alternatives. This section includes a discussion of a reasonable range of alternatives to the proposed project, or to the location of the project, which could feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and an evaluation of the comparative merits of the alternatives. This section also includes an evaluation of the no project alternative.
- Section 9 Compliance Conditions and Compliance Monitoring Plan (Compliance Plan). The Compliance Plan contains the means for ensuring all aspects of construction, operation and closure comply with LORS and with conditions/mitigations adopted by the CEC.

Section 3

Project Description

3 Project Description

3.1 Overview

The Morton Bay Geothermal Project (MBGP or project) would be a geothermal electric power generating facility (PGF). The project would be fitted with one steam turbine generator (STG) system (manufacturer undetermined) consisting of a condensing turbine generator set with three steam entry pressures. Turbine quality geothermal steam from the geothermal resource production facility (RPF) would be the only fuel used by the PGF. MBGP's maximum continuous rating would be approximately 157 megawatts (MW) gross output, an expected net output of approximately 140 MW, with a maximum annual electrical production of 1,226,400 MW-hours. MBGP would be designed and constructed in accordance with the design criteria provided in Appendix 2B (Jacobs 2023F) in accordance with applicable laws, ordinances, regulations, and standards (LORS).

Project elements, in addition to the STG, include the following:

- Geothermal fluid processing systems;
- Class II surface impoundment (brine pond);
- A solids handling system;
- Power distribution center (or control building);
- A service water pond;
- Water service;
- Parking areas, construction camps, borrow pits (partially shared);
- One 14-cell cooling tower;
- Twenty wells and 12 well pads;
- Substation near northeast corner of the MBGP site;
- New switching station at Garst and Sinclair roads;
- Production wells, injection wells, and pipelines;
- Generation interconnection (gen-tie) line.

For a geothermal project Public Resources Code sections 25120 and 25500, and California Code of Regulations, title 20, section 1201(q), set forth the scope of the CEC's certification to include the powerplant, site, and related facilities. In this case a certification by the CEC would authorize the applicant to develop the site and construct and operate the powerplant, along with linears connecting to the powerplant such as the transmission (gen-tie) line from the powerplant to the first point of interconnection, thermal resource conveyance pipelines running from the generating facility to the first or nearest production and injection wells, and any water pipelines to the project. These components will be fully analyzed and where appropriate, mitigation will be imposed on the project.

Other aspects of the project are under the jurisdiction of other agencies requiring permits and other approvals for those agencies. Development of the steam field and the drilling of production and injection wells will require approval from Imperial County (county) and the California Department of Conservation, Geologic Energy Management Division (CalGEM). The offsite switching station the project will be connecting to for energy to reach the wider transmission grid will be under the direction and approval of the Imperial Irrigation District (IID) which will own the switching station. Finally, temporary features such as potential construction workers camps, laydown/parking areas, and borrow pits are permitted by the county.

CEQA requires the lead agency to consider the whole of the action. While these project elements will be evaluated, to the extent staff concludes mitigation is necessary to reduce an impact to less than significant, mitigation measures will be set forth that can and should be adopted by the agency with permitting authority consistent with California Code of Regulations title 14, section 15091(a)(2).

Project Location

The proposed project is entirely within the northern portion of unincorporated Imperial County in the vicinity of the southeastern shore of the Salton Sea. The town of Niland is approximately four miles to the northeast and the town of Calipatria is approximately six miles southeast. The Sonny Bono National Wildlife Refuge headquarters is roughly 2.5 miles from the project. The primary geothermal generating facility site is on approximately 51 acres of a 160-acre parcel that has been assigned Assessor's Parcel Number (APN) 020-100-007. The parcel is bounded by McDonald Road to the north, Davis Road to the east, Schrimpf Road to the south, and the Salton Sea to the immediate west.

3.2 Project Setting, Description, Design, and Operation

The MBGP facility is sited within a bowl-shaped area that was likely previously used as a freshwater pond(s) for hunting purposes. The ponds are currently dry. The existing Hudson Ranch Power 1 geothermal-fired electrical generating plant is adjacent on the east across Davis Road. Similar pond basins (some dry) are adjacent to the north, south and west boundaries of the site. A shallow freshwater slough from agricultural irrigation runoff lies between the Salton Sea and the proposed MBGP site. Several carbon dioxide (CO_2) gas driven mud volcanoes, approximately 5-10 feet high, are sited at the vacant parcel southeast of the MBGP site. (Jacobs 2023a, TN 249723). Ancillary facilities are all on relatively flat, plowed, agricultural land, vacant property, equipment staging areas, or industrial (geothermal powerplant) areas.

The project is proposed in the Salton Sea Known Geothermal Resource Area (KGRA), an area known to have significant geothermal reserves. See section 3.2.3 for more information about the KGRA. The MBGP facility would utilize geothermal fluid from the production wells near the power generating facility The fluid will flow, without pumping, to and through above ground pipelines to the steam handling system where the fluid will be separated from the steam phase to produce high-pressure steam. Successive flashing

ultimately produces low pressure steam to be used in the steam turbine to produce electricity.

3.2.1 General Arrangement and Site Layout

Figure 3-1 below is the MBGP's general arrangement of features on the site. Figure 3-2 presents the proposed MBGP architectural rendering, and Figure 3-3 provides an illustration of the proposed site and ancillary project features (Jacobs 2023kk, TN253187). The project footprint is generally rectangular with the long axis running east and west. Surface water ponds and basins lie along the perimeter on three sides, the east, west, and south. The remainder of the plant equipment and office buildings and other structures, cooling tower, fuel storage, piping, substation, and paved surface parking is on the interior of the site.

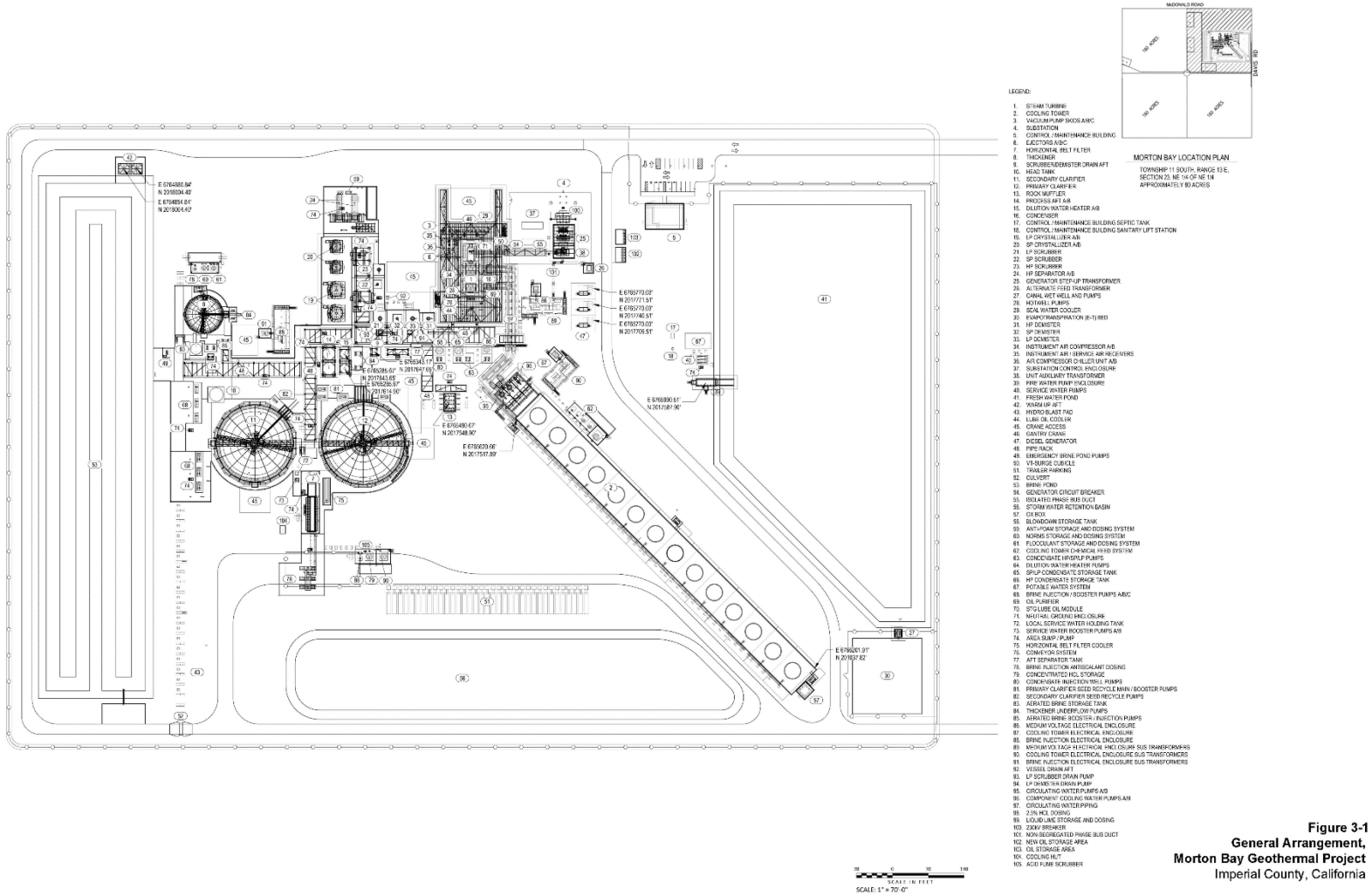

Figure 3-1
General Arrangement,
Morton Bay Geothermal Project
Imperial County, California

Jacobs

Figure 3-2
Architectural Rendering,
Morton Bay Geothermal Project
Imperial County, California

Jacobs

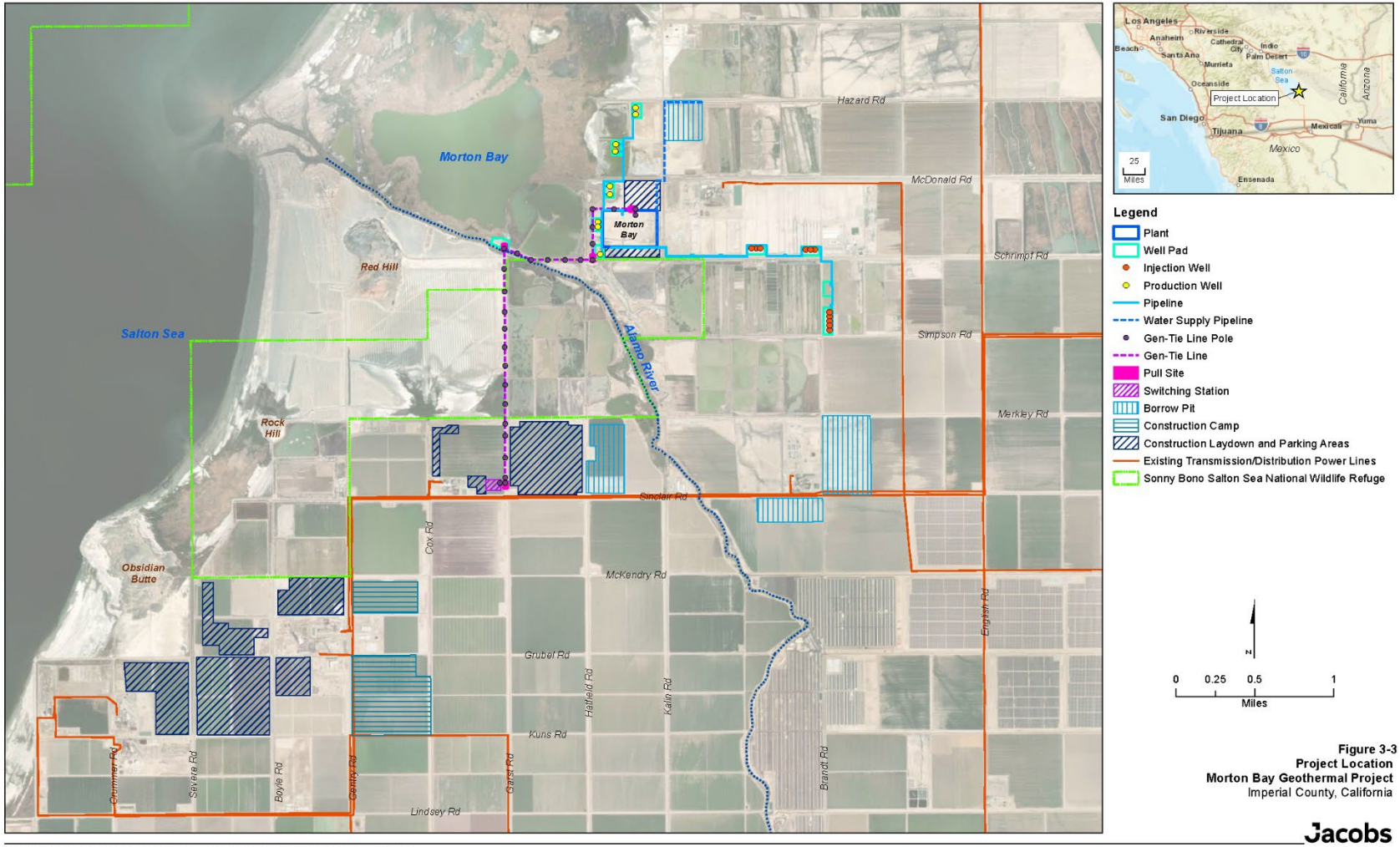

Figure 3-3
Project Location
Morton Bay Geothermal Project
Imperial County, California

Jacobs

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Access to the MBGP, which lies to the southwest of the intersection of McDonald Road and Davis Road, would be provided on existing roads (primarily Davis Road), via either State Highway 86 (from the west) or State Highway 111, approximately three point five miles east of the site. From Hwy. 86, the site would be served by Forrester Road, Gentry Road, West Sinclair Road, Garst Road, West Schrimpf Road, and Davis Road. From Hwy. 111, access to the site would be via McDonald Road and Davis Road. Primary and secondary access driveways will be from Davis Road on the east at either corner. Strategically placed internal paved roadways are planned to serve the site providing internal access to all project facilities and onsite buildings.

3.2.2 Geothermal Resource (Electricity) Production Facility (RPF)

The RPF includes geothermal production wells, pipelines, geothermal fluid and steam handling facilities delivering turbine quality steam, a solid handling system, brine pond, service water pond, a retention basin, process injection pumps, one power distribution center and geothermal injection wells. The generator will have an approximate rated capacity of 174,000-thousand-volt amps (kVA) at a 0.85 power factor lagging and leading. Geothermal steam from the RPF will be the only fuel used by the steam turbine generator (STG). Nominal turbine inlet pressures are as follows:

- High pressure (HP): 305 pounds per square inch gauge (psig)
- Standard pressure (SP): 122 psig
- Low pressure (LP): 15 psig
- The turbine is coupled directly to a totally enclosed water and air-cooled (TEWAC) synchronous 13.8 kV generator. The turbine-generator unit will be fully equipped with all the necessary auxiliary systems for turbine control and speed protection, lubricating oil, gland sealing, generator excitation, and cooling.

The PGF includes a triple pressure (low, medium and high) condensing turbine/generator set, surface condensers, non-condensable gas (NCG) removal system, a NCG sparger abatement system and condensate bio-oxidation abatement systems in the cooling tower, a heat rejection system, and a generator step-up transformer (GSU). The PGF also includes a 230 kV substation and power distribution centers, three emergency standby diesel fueled engines (two generators and one fire water pump). Shared facilities among the RPF and PGF include a control building, a service water pond, and other ancillary facilities.

3.2.3 Salton Sea Known Geothermal Resource Area (KGRA)

The Salton Sea Known Geothermal Resource Area (KGRA) is a feature that lies within the Salton Trough. The Salton Trough is a 3,100-square-mile geological structural depression that extends from the Transverse Mountain Range on the north to the Gulf of California on the south. The Peninsular Mountain Range forms the western boundary, and the Colorado River forms the eastern boundary. The Salton Trough is a seismically active rift valley where sedimentation and natural tectonic subsidence are nearly in equilibrium.

The California Department of Conservation-California State Mining and Geology Boards (SMGB) recognizes the Salton Trough as an area with thermal water of sufficient temperature for potential geothermal energy development. The SMGB has designated the Salton Sea as a geothermal field. The KGRA has been known to have significant geothermal reserves since oil and gas companies first discovered the field in 1958 during exploration. The KGRA includes 161 square miles (103,221.51 acres). Distinct geothermal anomalies are distributed throughout the Salton Trough, where hotter fluids suitable for electric generation are accessible (Imperial County General Plan Renewable Energy and Transmission Element 2015).

Commercial operation of the Salton Sea geothermal reservoir began in 1982. Since then, nine additional generating units were developed and operate at a total capacity of 395 MW(net). The most recent facility, Hudson Ranch Power 1, began commercial operations in 2012.

3.2.5 Major Electrical Equipment and Support Systems

Alternating Current (AC) Power Transmission

Electricity will be produced at the MBGP by the 13.8 kV TEWAC generator. The output of the steam turbine generator is connected by isolated phase bus to a two-winding, oil-filled (13.8 to 230 kV) steam turbine generator main step-up transformer with a load tap changer. Surge arrestors around the high-voltage bushings protect the transformer in the 230 kV system from lightning strikes or other disturbances. The transformer is set on a concrete pad with an oil containment system. The main transformers will be protected per the National Fire Protection Association by either maintaining adequate separation or providing sprinklers.

AC Power Distribution System

Power from the MBGP will be provided from the substation switchyard through the STG main step-up transformer and unit auxiliary transformers. The substation will deliver energy through a generation interconnection (gen-tie) line into the IID transmission system at a new switching station near and northwest of the intersection of Garst Road and West Sinclair Road. The medium-voltage auxiliary load is supplied by two separate 4,160-volt switchgears, each with an incoming main circuit breaker supplied by a 13,800-4,160-volt auxiliary transformer. A 4,160-volt cable tie is connected to a 4,160-volt tie circuit breaker connected in each switchgear. One of the 4,160-volt tie circuit breakers is normally open, and each 13,800-4,160-volt auxiliary transformer is sized for the installed 4,160-volt station auxiliary load. Paralleling standby generators are connected through circuit breakers to one 4,160-volt switchgear. Medium-voltage motors will be supplied from the 4,160-volt system.

The load center transformers will provide power to the 480-volt motor control centers (MCCs). The MCCs distribute power to all 480-volt motors, 480-volt power panels, and to other 480-volt loads. The neutral of the 480-volt system is grounded with individual

feeder ground fault detection. The 480-volt MCCs and/or 480-volt power panels provide power to 480-120/208-volt dry-type transformers. A detailed discussion of the electric transmission system is provided in Section 4 .3 of this staff assessment, Transmission System Engineering.

Facility Startup Power and Standby Emergency Power

The MBGP is not designed to be black-start capable. Electric power from the utility system must be present to be able to bring the facility online. During normal startup, power required for auxiliaries will be provided from the IID (also the power utility) through the STG main step-up transformer, then through the unit auxiliary transformers.

In case of a total loss of auxiliary power, or in a situation when the utility system is out of service, the emergency electrical power for the plant critical loads (fluid booster pumps, air compressor, turbine turning gear, emergency lighting, heating, ventilation, and air condition; injection pumps; and other vital loads) will be supplied by standby diesel engine driven emergency generators. Project design parameters identified a need for three generators. Two of the generators will have an output of up to 3.25 MW 4,160 volts and one generator will have an output of up to 2.5 MW 480 volts. These generators are sized to maintain operation of the RPF and critical loads associated with the PGF and common facilities.

Distributed Control Systems

A distributed control system (DCS) would provide modulating control, digital control, and monitoring and indicating functions for operation of the proposed plant power island and offsite systems. Plant operation would be controlled from the video display unit (VDU) type control consoles and the auxiliary control panels in the control room.

The DCS would provide coordinated control among the STG and balance-of-plant equipment. The STG control systems would interface with the DCS via a data link and/or hardwired input/output (I/O) devices. Limited monitoring and control will be available from the DCS for STGs. The balance-of-plant equipment will be monitored and controlled via the DCS. A sequence-of-events recorder will be an integral part of the DCS. Indication of process changes that warrant action (process alarms), or information that the operator in the control room should be made aware of (annunciation) will primarily be done by the DCS. Major packaged subsystems (for example, water treatment system, fire protection system) may have a local alarm system with a single trouble alarm to the control room.

Direct Current Power Supply

The direct current (DC) power supply system consists of battery banks, with redundant 125 volts of direct current (VDC) full-capacity battery chargers, metering, ground detector, and distribution panel. The station 125 VDC system supplies control power to the generator circuit breakers, protection relay panels, switchgear, turbine generator DC lube oil pump, and to other critical control circuits. Under normal operating conditions, the battery chargers supply DC power to the DC loads. The battery chargers receive 480

V, 3-phase alternating current power from one of the MCCs and continuously charge the batteries while supplying power to the DC loads. The 125 VDC system is an ungrounded system, and a ground detector will monitor for grounds on the DC power supply system.

Essential Service Alternating Current

The facility essential service 120 volts of alternating current (VAC), single-phase, 60 hertz (Hz) power source will supply alternating current (AC) power to essential DCS loads and to unit protection and safety systems that require uninterruptible AC power. The essential service AC system and its DC power supply system are both designed to supply critical safety and unit protection control circuits. The essential service AC system consists of an inverter, a solid-state transfer switch, a manual bypass switch, an alternate source transformer and voltage regulator, and AC panelboards.

If the normal 480-volt source of power to the system fails, the dedicated 125 VDC battery powers the inverter to the panel boards. The solid-state transfer switch continuously monitors both the inverter output and the alternate AC source. The transfer switch automatically transfers essential AC loads without interruption from the inverter output to the alternate source upon loss of the inverter output. A manual bypass switch isolates the inverter-static transfer switch for testing and maintenance without interruption to the essential service AC loads. Recharging of a battery occurs when 480-volt power returns from the AC power supply (480-volt) system. The rate of charge depends on the characteristics of the battery, battery charger, and the connected DC load during charging; however, the maximum recharge time is eight hours.

Transmission

Electricity generated by the MBGP will be delivered to a substation near the northeast corner of the MBGP site. This substation will deliver energy through a generation interconnection (gen-tie) line into the Imperial Irrigation District (IID) transmission system at a new as-yet-to-be built 230 kV switching station near the intersection of Garst Road and West Sinclair Road, approximately 2.3 miles from MBGP, adjacent to the proposed Elmore North geothermal project, under the same ownership. The applicant will engineer, construct, own, operate, and maintain the interconnection gen-tie line between the proposed MBGP GSU and the first point of connection (switching station) within IID's balancing authority to the California Independent System Operator. The switching station will be constructed as part of the IID system upgrades.

3.2.6 Heat Rejection (Cooling) System

The power cycle (steam handling) heat rejection system includes a stainless steel (or similar material) shell-and-tube type condenser, a counterflow cooling tower, an NCG removal system, and hydrogen sulfide (H_2S) abatement system. Steam from the turbine exhaust is condensed in the shell-and-tube type condenser. Stainless steel piping will transfer condensate to the biological oxidizer unit adjacent to the cooling tower, where soluble H_2S is abated. Gases that accumulate in the condenser will be removed by the gas removal system (GRS) and transferred to the spargers located in the cooling tower

basin. The GRS consists of multiple redundant trains of ejectors, and liquid ring vacuum pumps. Auxiliary steam for the ejectors will be supplied from the SP steam pipeline.

The cooling tower will consist of a single 14-cell tower, equipped with 480-volt motor driven fans. Each cell will be partitioned from the adjacent cells, allowing maintenance during normal operation. The cooling tower basin will be equipped with a vertical, wet-pit circulating water pump(s) designed to circulate water between the cooling tower and the turbine condensers. The cooling tower also will be equipped with a vertical, wet-pit auxiliary water pump(s) designed to move water between the cooling tower and the plant auxiliary cooling loads. The plant auxiliary cooling water loads will include the generator cooling system, NCG removal system, turbine lubricating oil and control oil cooling system, and solids dewatering system. The cooling tower will be equipped with drift eliminators that limit drift to no more than 0.0005 percent of the recirculating water flow rate.

During the steam handling process, after successive flashing of the steam, dilution water (heated and deoxygenated canal water) is introduced into the LP crystallizer to control solid precipitation. A final steam separation will occur in an atmospheric flash tank to ensure that no residual pressure is transferred to the clarifier tanks. The depressurized fluid will flow into the primary and secondary clarifiers to remove suspended solids that precipitated upstream, by design, in the RPF. Geothermal fluid is stabilized via solids precipitation to equilibrium from a state of super saturation during reductions in temperature and pressures, making the injection process sustainable. Injection of super saturated silica fluid and/or suspended solids would be an unmanageable process due to scaling and plugging of wells. Geothermal reservoir pressure is maintained by injecting and returning the fluid, allowing for the fluid to be reheated causing the resource to be renewable and sustainable.

Three types of injection wells are used to return the geothermal fluids back to the reservoir: of spent geothermal fluid, aerated fluid, and condensate. The fluid streams are separated through the RPF process and remixing the fluids risks sustainable injection through scaling and excess solids precipitation. These reactions between fluid streams are due to differentials in oxygen content, the potential of Hydrogen, or pH, and temperature. Spent geothermal fluid comes from the process described above. Aerated fluid is oxygenated at or near ambient temperature, which comes from RPF surface impoundment and similar sources. Condensate comes from the cooling tower as an aerated mix of condensed steam and cooling tower make-up water. All production and injection wells will be operated in accordance with California Department of Conservation, Geologic Energy Management Division (CalGEM) regulations.

Steam from the RPF will have impurities removed, after which it will be delivered to the condensing steam turbine. Steam will be condensed in surface condensers for use as make-up water for the cooling towers, turbine steam washes, and other minor process activities. The gas removal system extracts NCG's from the main condensers and then directs them to the cooling tower basin for abatement.

3.2.7 Water Supply and Use, Incl. Surface Impoundment

Water Quality and Water Supply Requirements

With two exceptions, no constituents in the IID canal water are expected to violate maximum contaminant (MCL) concentration levels. Specific conductance and total dissolved solids (TDS) were detected above their respective Secondary MCLs in one well. Secondary MCLs are established for various compounds to protect against unpleasant aesthetic effects, such as taste and color. Exceeding secondary MCLs for these compounds does not pose a health risk.

The MBGP requires an expected average annual use of 5,560 acre-feet per year (afy) of water when operating at full plant load for uses including plant water, dilution water, plant wash down, and cooling tower makeup. Average annual supply requirements will vary, depending on the capacity factor of the overall facility.

Approximately 50 percent of the water required by the MBGP will be generated by steam condensed in the main condenser. On an annual average basis during operation, water needs from the IID canal are approximately 5,560 afy at design conditions, which is less than approximately 50 percent of the total facility water needs.

Process Water, Reverse Osmosis Potable Water Supply, and Dilution Water

The remaining water source for the MBGP will be IID canal water. The delivery (custody transfer) point for the IID canal water will be the N Lateral, Gate N_36, with a back delivery point of O Lateral, Gate 32. Transfer to the service water pond will be via a pumped water transfer pipeline from the N Lateral on West Schrimpf Road south of the site. The water will be used for cooling tower makeup, dilution water system, other minor process uses, and for the reverse osmosis (RO) potable water system. The RO water system will be used to supply drinking water (except during construction, it will be trucked in and distributed), wash basin water, eyewash equipment water, water for showers, and toilets in crew change quarters, fire protection, and sink water in the sample laboratory. Dilution water is heated and de-aerated before being introduced into the LP crystallizer(s) to control solid precipitation.

Fluid Process Streams

The primary discharge would consist of spent geothermal fluid from the secondary clarifiers that is injected into the injection wells to replenish the geothermal resource. The maximum daily peak flow of waste to the brine pond (ultimately to the injection wells) is 815 gallons per minute (gpm), and the annual average discharge is 1,311 afy. In overflow conditions, this spent geothermal fluid would be directed to the brine pond, after which it would be injected into a dedicated aerated fluid injection well. This injection well also would receive fluid from the thickener, which collects filter press filtrate, and fluid from the plant conveyance system around the plant equipment. Monitoring wells would be provided adjacent to the brine pond to comply with Regional Water Quality Control Board

(RWQCB) ground water regulations. Fluid injection will take place in accordance with CalGEM requirements.

Another geothermal process fluid is blowdown from the cooling towers. Blowdown originates as condensed geothermal steam. This process stream will be returned to the reservoir through a dedicated condensate injection well. The sanitary drains will discharge to a septic tank. Waste from the septic tank will be pumped out periodically. The septic tank will outlet to the dispersal system, such as a leach field, evapotranspiration bed, or other approved disposal method based on site constraints.

Cooling Tower Water and Other Process Uses

Water is required for cooling tower makeup to offset water lost through evaporation. Cooling tower makeup water will be provided primarily by condensed geothermal steam from the main condenser. During high ambient conditions, more supplemental water will be used from the service pond. The MBGP uses condensate for steam wash water, purge water for pump seals, and water for the solids dewatering system. The MBGP is designed to minimize reliance on external water supply for these process needs as well by using condensed geothermal steam from the main condenser to the greatest extent practical. By doing this, it is expected that less than 50 percent of the process water needs on an annual average basis will be met from IID canal water supply. IID canal water also will serve as the water source for maintenance activities, the fire protection system, and to fill the cooling tower prior to startup.

Wastewater, Sanitary Sewer, and Stormwater

Wastewater generated during construction, handled at the project site level, will include sanitary waste and could include excavation dewatering water, equipment wash-water, shower water, and stormwater runoff. Sanitary waste will be collected in portable, self-contained toilets and disposed of by a contracted sanitary service, or possibly comingled with shower and other wash-water and stored in a septic tank built to Imperial County specifications until it can be disposed of by contractor. Sludge from the septic system will either be sent to an onsite leach field or will be periodically removed and trucked offsite for disposal. Excavation dewatering water and equipment wash-water will be contained within designated areas, sampled, and if nonhazardous transported to the retention basin. Stormwater runoff will be managed in accordance with a stormwater management permit, which will be obtained prior to construction. Storm drainage will be collected in the retention basin and allowed to evaporate. Nonhazardous wastewater generation will be minimized, where feasible, by water conservation and reuse measures, and incorporated into activities such as dust control and road watering.

Class II Surface Impoundment (brine pond)

A Class II surface impoundment (brine pond) is along the western edge of the project site. The brine pond is a concrete-lined basin sized to accommodate partial draining of the primary and secondary clarifier, plus two feet of freeboard. The triple-lined brine pond would include a leachate collection and removal system (LCRS) to detect any leaks in the

primary liner. The LCRS will include an automated (or possibly manual) pump collection system that will discharge first into a 300-gallon above ground tank, or other sufficiently sized containment system, and then recirculated back into the brine pond. Monitoring wells will be adjacent to the brine pond to comply with RWQCB regulations.

During upset conditions, spent geothermal fluid that overflows from the clarifiers and the thickener would be directed to the brine pond for temporary storage, after which this fluid is pumped to the aerated geothermal fluid injection well. In addition to temporarily retaining spent geothermal fluid prior to injection, the brine pond temporarily stores solids that have either precipitated or settled out of the geothermal fluids during the power generation process. The brine pond also holds fluids generated during emergency situations, maintenance operations, and water from hydro blasting, safety showers, and eye wash stations, vehicle wash station effluent, water from the plant conveyance system, and reject water from the RO process. The brine pond collects geothermal fluid from wells during flow-testing, after drilling maintenance, and from startup. This fluid would be discharged into an injection well after startup is complete.

3.2.8 Non-Hazardous and Hazardous Waste Management

The construction and operation of the MBGP will generate both nonhazardous and hazardous waste. The nonhazardous waste stream includes filter cake generated during operations (the largest single stream), as well as miscellaneous construction debris and other materials requiring removal during site grading and excavation. In addition to nonhazardous wastes, small quantities of hazardous wastes may be generated, including solid deposits in the clarifiers and other equipment and piping, waste paint, spent solvents, and spent welding materials. All hazardous waste generated during construction and operations will be handled and disposed of in accordance with all LORS.

Any hazardous wastes (precipitated solids estimated to be approximately five percent of the filter cake, 95 percent non-hazardous is the goal) generated during construction will be collected in hazardous waste accumulation containers near the point of generation and moved to the contractor's 90-day hazardous waste storage area located onsite. The accumulated waste would subsequently be delivered to an authorized waste management facility. Hazardous wastes will be either recycled or disposed of in a licensed Class I disposal facility as appropriate.

Where feasible, hazardous wastes will be recycled, including used oils from equipment maintenance, and oil-contaminated materials such as spent oil filters, rags, or other cleanup materials. Used oil will be recycled, and oil or heavy metal contaminated materials (for example, filters) requiring disposal will be disposed of in a Class I waste disposal facility. Scale from equipment cleaning operations, laboratory waste, cooling tower debris, and solids from the brine pond, will be disposed of in a similar manner.

3.2.9 Solid Waste Management, Construction and Operations

Inert solid waste from construction activities may include lumber, excess concrete, metal, glass scrap, cardboard, general trash, and empty nonhazardous containers. Typical management practices required for nonhazardous waste management include recycling when possible, proper storage of waste and debris to prevent wind dispersion, and weekly pickup and disposal of wastes to local Class III landfills. The total amount of solid waste to be generated by construction activities has been estimated to be similar to that generated for normal commercial construction. Office waste and general refuse will be removed by the local sanitation service.

The primary source of operational solid waste will be the precipitated solids from the geothermal resource fluid. After the steam separation, the geothermal resource fluid will be treated through clarifiers where some of the silica, iron, and manganese contained in the fluid will be removed. Following this clarification process, the solids slurry discharging from the bottom of the clarifiers will be directed to a vacuum filtration system. The slurry feed from the clarifiers to the filtration system will be acidified to prevent heavy metal precipitation in the filtration system. Fluids from the filtration system will be routed to a thickener system for additional solids removal. Slurry discharged from the thickener will be discharged to the filtration system. The filter cake will be disposed of at a suitable offsite landfill in accordance with applicable regulations.

Facility maintenance will include the removal of scale from the walls of piping and fluid handling equipment, and the removal of sludge from the primary and secondary clarifiers and from the brine pond.

In addition to temporarily retaining geothermal fluid prior to injection, the brine pond temporarily stores solids that have either precipitated or settled out of the geothermal fluid during the energy generating process. Periodically, the brine pond solids are removed and disposed of at a proper disposal facility. 3.2.10 Hazardous Materials Management, Construction and Operation

A variety of chemicals will be stored and used during construction of the MBGP. Hazardous materials to be used during construction include unleaded gasoline, diesel fuel, oil, lubricants (for example, motor oil, transmission fluid, and hydraulic fluid), solvents, adhesives, and paint materials. There are no feasible alternatives to these materials for construction or operation of construction vehicles and equipment, or for painting and caulking buildings and equipment. A hazardous materials handling program governing storage, containment, and handling will be implemented during construction in compliance with applicable LORS.

The MBGP will develop and implement a Hazardous Materials Business Plan (HMBP) for operations, which will include procedures for the following:

- Hazardous materials handling, use, and storage
- Emergency response

- Spill control and prevention
- Employee training
- Reporting and record keeping

Chemicals will be stored in chemical storage areas appropriately designed for their individual characteristics. Bulk chemicals will be stored outdoors on impervious surfaces in aboveground storage tanks with secondary containment. Secondary containment areas for bulk storage tanks will provide secondary means of containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation. Any chemical spills in these areas will be removed with portable equipment and reused or disposed of properly. Other chemicals will be stored and used in their delivery containers. A portable storage trailer may be onsite for storage of maintenance lube oils, chemicals, paints, and other construction materials, as needed. All drains and vent piping for volatile chemicals will be trapped and isolated from other drains to eliminate noxious vapors.

Safety showers and eyewash stations will be provided in or adjacent to chemical storage and use areas. Safety equipment will be provided for personnel use if required during chemical containment and cleanup activities. All personnel working with chemicals will be trained in proper handling and emergency response to chemical spills or accidental releases. Hose connections will be provided near chemical storage and feed areas to flush spills and leaks, and absorbent materials will be stored onsite for spill cleanup.

3.2.10 Eligible Renewable Resources and Control Philosophy

The MBGP is an eligible renewable energy resource as defined by California Public Utilities Commission (CPUC) and fits the definition of a renewable electrical generation facility. MBGP plans to generate geothermal energy 24 hours per day, 365 days per year (except during major maintenance years) and has a designed capacity factor of 95 percent or higher. MBGP will be designed with a high degree of automation to reduce the required actions performed by operating personnel. A small core team of personnel (3-5) can be expected to be on site on a regular basis.

Start up and Shutdown

A cold start would occur when the MBGP is completely shut down and all fluid flow to the plant is isolated for an extended period. A warm start would occur when the turbine is taken offline and the RPF continues to operate. Warm startups will require approximately 10 hours.

Control Philosophy

The control system will consist of an integrated microprocessor-based DCS. The control system will provide for startup, shutdown, and control of plant operation limits, and will provide protection for the equipment. Interlock and logic systems will be provided with hardwired relays, the DCS, or programmable logic controllers. Process variables

(pressure, temperature, level) used for protective functions will be connected directly to the DCS and the protective system.

Output from the MBGP will be sensitive to the ambient wet bulb, which impacts the cooling capacity of the cooling tower and varies during the course of the year. The cooling tower will, therefore, be designed with an 80ºF wet bulb to provide sufficient capacity for ambient temperature during the summer peaks, when the electrical customers' usage is at its highest.

3.3 Construction

Construction and commissioning activity is expected to take approximately 29 months, including four months wrap-up activities post commencement of commercial operation. Phases of construction by general work type would include the following, based on work occurring at the generating facility and related facilities, and other work occurring on elements under either CalGEM or Imperial County auspices:

MBGP and related facilities:

- Construction of power plant facilities and all on-site ancillary equipment
- Construction of gen-tie line to first point of interconnect
- Construction of water supply pipeline
- Construction of conveyance pipeline to the first well

Other:

- Drilling operations for production and injection wells
- Siting and erection of conveyance pipelines in the well complex
- switching station for the IID transmission system, including:
- Installing foundations,
- Assembling and erecting the structures,
- Clearing, pulling, and stringing lines,
- Installing ground wires and conductors,
- Installing counterpoise/ground rods,
- Cleanup and site reclamation.

Construction activity will be based on a two-shift, 10 hours per day, six days per week schedule, with a seven-day work week possible. Construction labor workforce personnel is expected to peak between during approximately the 22nd and 23rd month, with a maximum between 536 workers. Facility startup schedules are based on a two-shift, 24 hours per day, seven days per week work week. Overtime and shift work for construction may be used to maintain or enhance the construction schedule (Jacobs 2023a

TN249723). Workers including construction craft employees, supervisory and support staff, and construction management personnel, can be expected to be onsite during typical working hours, between 7 am and 8 pm, with the possibility of adjustment for shortened winter daylight hours, for specialize work such as concrete pours, or for noisy construction activities.

3.4 Ancillary Facilities

Project-related ancillary facilities within five miles of the project site, include production and injection well sites, utilities, wells, and well pads, aboveground production and injection pipelines, laydown yards, construction camps, and borrow pits and require jurisdictional approval by agencies other than the CEC. An integral plant instrument air system provides compressed, dry air for use in instruments and control devices. A standby air compressor and standby ancillary equipment (regenerative air drier, receiver, and instrumentation) also will be provided for added reliability. The fire water system will provide fire protection for all plant personnel and equipment; it includes a primary fire water pump, a backup diesel-powered pump, and the fire water pipeline system.

Utilities

The remote location of the proposed project means that typical municipal utility services are not present at the property boundaries. The difficulty of extending services to the site makes it more feasible to provide for project needs at the site level.

Temporary Utilities

Temporary utilities will be provided for the MBGP construction offices, laydown areas, construction camps, and the project construction site. Temporary construction power at the site will be supplied by temporary generators and, as practical, utility-furnished power. Area lighting during construction will be strategically located for safety and security.

Electricity and Gas

Electricity generated by the MBGP will be delivered to a new switching station, which then delivers the energy through to the Imperial Irrigation District (IID) distribution system. IID will provide auxiliary power to the project. Natural gas lines are not at the plant site, nor will they be extended to the site.

Construction Laydown and Worker Parking

Construction laydown and parking areas combined will make up approximately 600 acres (for MBGP, Elmore North, and Black Rock together). These areas will be available for equipment and materials laydown, storage, construction equipment parking, small fabrication areas, and office trailers. Mobile trailers will be used as construction offices, stationed within one of the nearby construction laydown areas, with visitor parking available adjacent to the construction offices. Construction worker parking will be in one

of up to nine parking and laydown areas identified within the project vicinity (see Figure 3-3), with the most likely parking areas nearest to the construction.

The layout of access roads and loading areas, with controlled access for personnel and vehicles, are important in the development of the laydown yard. Outdoor and weather-protected space is required, planned, and provided for turbine parts, structural steel, piping spools, electrical components, switchyard apparatus, well drilling equipment, and associated maintenance activities. Security fencing will be installed around the site boundary, including the laydown areas.

Construction Camps

Increased regional peak workforce may require temporary housing and facilities (construction camps) for construction workers affiliated with MBGP, as well as Elmore North and Black Rock. Three potential areas are identified for this use (see Figure 3-3). Because of the potential need, the temporary camp locations are included in the AFC and may be located east of Gentry Road and south of Sinclair Road, east of Gentry Road and north of Kuns Road. Construction camps will be a total of approximately 206 acres (for all three projects).

Borrow Pits

Part of the proposed MBGP is up to four borrow pits in the vicinity of the project, to be shared by all three project, and will be a total of approximately 460 acres (see Figure 3-3). Surface mining activities that will result in the disturbance of more than one acre of fill material or remove more than 1,000 cubic yards of material, such as those associated with the proposed project, are subject to Surface Mining and Reclamation Act (SMARA) requirements. SMARA provides comprehensive surface mining policy with the regulation of surface mining operations to minimize adverse environmental impacts to mined lands. MBGP will not result in a loss of availability of a known mineral resource that would be of value to the region and the residents of the state. Additionally, MBGP will not result in the loss of availability of a locally important mineral resource recovery site delineated on a local plan, specific plan, or other land use plan. The proposed project will apply for a one-time exemption from SMARA regulations.

Well Fields, Well Pads, Wells, and Pipelines

Production and injection well pads constitute approximately 50 acres. The proposed project will have nine production wells (on five well pads), and 11 injection wells (on six well pads). One additional injection well pad (backup) is identified for resource support. Well drilling operations are conducted 24 hours per day, seven days per week. Eight weeks is estimated to drill each well, and approximately 17 people will be working at each drilling site at any one time. A diesel/electric drilling rig would be used to construct the production and injection wells.

Drill rig assembly (rig mobilization) is anticipated to require approximately one week per well. Prior to drilling and rig mobilization, preparation of a drilling site requires grading

(clearing and leveling) of approximately two to four point five acres per well pad. A well pad will contain typically one to three wells reducing the overall surface disturbance by hosting more than one well on a well pad. This cleared area includes an equipment staging and activity area, a drill pad and mud tank storage area. Well-drilling operations and construction are regulated by CalGEM, which includes the well design and drilling program and inspection of blowout prevention equipment.

A system of aboveground pipelines will be constructed to connect the MBGP with the production and injection wells. Wherever possible, these pipelines will be placed next to the borders of fields or along access roads to minimize the amount of land affected.

3.5 Emission Control and Monitoring

Construction emissions from all onsite and offsite project activities, including combustion emissions and fugitive dust emissions, would be controlled and monitored with the implementation of Conditions of Certification (COC) **AQ-SC1** through **AQ-SC5**. The applicant would also be required to submit a Dust Control Plan to Imperial County Air Pollution Control District (ICAPCD) per ICAPCD Rule 801 and implement Best Available Control Measures per ICAPCD Rule 804.

During project operations, best available control technologies (BACT) will be required and implemented for particulate matter of 10 micrometers or less in diameter (PM10) and H_2S. The cooling tower of the proposed project would be equipped with high efficiency drift eliminators with a 0.0005 percent drift rate and thus satisfies the BACT requirements for PM10 emissions. The proposed project would utilize a sparger system for H_2S removal from the gas stream and a biological oxidation box to oxidize the liquid phase H_2S into elemental sulfur and or sulfates with a combined minimum destruction and removal efficiency of 98.5 percent to meet the BACT requirements for H_2S emissions. The applicant is required to monitor the H_2S and particulate matter emissions per COC **AQ-50** through **AQ-52**, **AQ-55** and **AQ-56**.

The hydrogen chloride (HCl) storage tank would be controlled by a scrubber with a minimum control efficiency of 99 percent for HCl emissions. COC **AQ-71** requires the applicant to conduct a source test within ninety (90) days of start-up and every three years thereafter to ensure compliance.

The diesel-fired emergency generators will be Tier 4 certified engines, meaning DPM and criteria pollutant emissions will be minimized through Tier 4 controls, including selective catalytic reduction, diesel particulate filtration, and a diesel oxidation catalyst. The diesel fire pump engine will be BACT compliant with a Tier 3 certified engine.

3.6 Plant Safety and Risk Reduction Systems

Safety precautions and emergency systems would be included in the design and construction of the MBGP to ensure safe and reliable operation of project facilities. Monitoring and maintenance systems, and modern design will enhance safety, security,

and reliability. Safety, auxiliary, and emergency systems consist of required lighting; battery backup for controls, fire, and hazardous materials safety systems; steam utilities; and chemical safety systems.

Personal Safety and Security

To ensure the safety of all employees and personnel working in or near the MBGP, the applicant will establish a safety plan that conforms to federal, state, and local regulations. Key components of the plan would include:

- Plant Familiarity: Employees are to be thoroughly familiar with project operations and procedures, as well as the equipment being operated.
- Clearances: Written clearance procedures will be followed before working on or entering any equipment.
- Proper Equipment Designation: Equipment to be operated or worked on will be properly designated, by name and number.
- Responsibility: Operations and duties are performed only by duly authorized employees, who are held responsible for their actions.
- Monitoring: Employees will be required to maintain a continuing check on operating conditions to prevent a potential hazard to personnel and equipment.
- Records: Employees who are required to keep logs and records will keep them current and maintain a high level of accuracy. Abnormal or special conditions will be called promptly to the attention of the proper supervisors and logged. Shift employees will familiarize themselves with all activities within their jurisdiction that have taken place during the preceding shift.

A formal written site security plan will be developed and implemented by the applicant. Personnel will be trained in the requirements of the plan and all visitors will be required to adhere to the plan to ensure physical power plant security under all conditions.

Lighting

Lighting on the proposed project site will be directed on site to avoid backscatter and limited to areas required for safety. Lighting will be shielded from public view to the greatest extent practical. All lighting that is not required to be on during nighttime hours will be controlled with sensors or switches operated such that the lighting will be on only when needed. Lighting will be provided in the following areas:

- Building interior, office, control, and maintenance areas
- Building exterior entrances
- Outdoor equipment platforms and walkways
- Transformer areas
- Power island perimeter roads

- Parking areas
- Plant entrance

Fire Protection

The MBGP fire protection and safety systems are designed to limit personnel injury, property loss, and plant downtime caused by a fire or other event. The systems are designed in accordance with:

- Federal, state, and local fire codes, occupational health and safety regulations, and other jurisdictional requirements
- California Building Code (CBC)
- Applicable NFPA standards

The fire protection system will consist of underground fire mains and surface distribution equipment meeting applicable standards such as yard hydrants, sprinkler systems for the maintenance building, turbine generator, lube oil modules, diesel driven fire pump, as well as a complete fire detection and alarm system. The main transformers will be protected by either maintaining adequate separation or providing sprinklers. The fire water supply and pumping system will provide an adequate quantity of firefighting water.

An underground fire main loop will supply water to the cooling tower area, crystallizer/clarifier area, and the turbine generator area, via several strategically located hydrants around the plant perimeter. Hydrant locations will permit full coverage of the protected areas with approximately 150-foot-long fire hoses. The turbine generator lube oil system, including the turbine and generator bearings, will be protected with automatic sprinklers and/or water spray systems. Electrical equipment buildings will be monitored with a smoke detection system. Portable carbon dioxide (CO_2) and dry chemical extinguishers will be located throughout the plant (including the switchgear rooms), with size, rating, and spacing. Handcart CO_2 extinguishers also will be provided in the turbine area as necessary for specific hazards.

A fire protection control panel will monitor and alarm the complete fire protection system from the control room. The fire detection and monitoring systems will be designed and installed in accordance with applicable LORS. Firewater storage will be included within the service pond capacity, which will ensure an adequate water supply for fire protection.

There are power and distribution controls (PDCs) designed for this site, and the control building also includes an electrical equipment room. Each PDC will be provided with smoke detection and pull stations inside the enclosure. PDCs with battery rooms will have hydrogen sulfide detection and also be equipped with an exhaust system that runs continuously to mitigate any accumulation of hydrogen sulfide gas in the PDC. Both the hydrogen sulfide sensor and a fan failure alarm will be tied into the plant DCS system.

Public Health and Emergency Response

The MBGP will have an emergency response plan, an employee hazards communication program, a Spill Prevention, Countermeasures, and Control Plan, safety programs, and employee training that will address potential emergencies, including chemical releases, fires, and injuries, and will describe emergency response equipment and its location, evacuation routes, reporting to local emergency response agencies, annual emergency response drills identifying responsibilities for emergency response, and other actions to be taken in case of an emergency.

Employee response to an emergency will be limited to the awareness and first responder levels to minimize the risk of escalation of the accident or injury. Training consistent with these response levels will be provided to employees. A first aid station with adequate first aid supplies and personnel qualified in first aid treatment will be provided onsite.

The Calipatria Fire Department has the primary responsibility for dispatching emergency medical technicians (EMTs). Backup EMT units are available from Niland. Emergency medical response to the plant based will be based on availability. Ambulances will be dispatched from Imperial by the Calipatria emergency response team. The nearest hospital is in Imperial; however, burn patients would be transported to the University of California, San Diego burn center via helicopter.

Emergency services will be coordinated with the local fire department and hospital. First aid kits will be provided at the construction site and regularly maintained. As required by federal, state, and local requirements, first aid training will be provided to the appropriate staff.

Seismic Safety

The location of the proposed project site in the south-central portion of the Salton Trough subject the project to potential strong ground motion from a seismic event centered on one of several nearby active faults. The potential (low) impacts of the geologic hazards on the plant and ancillary facility operations include liquefaction, seismic shaking, post-liquefaction settlement, seismically induced flooding, settlement, and subsidence. Design and construction of the generating plant will be in conformance with the current California Building requirements.

Flood Protection

The proposed project is near the Salton Sea and is therefore in the special flood hazard area as defined by Imperial County, Title 9, Land Use Ordinance # 1203, Division 16. A berm would be constructed around the entire generating facility to mitigate the flood hazard. The applicant is preparing Letter of Map Revision (LOMR) to be submitted to Imperial County and the Federal Emergency Management Agency in the second quarter of 2023 to revise the 100-year flood zone based on hydraulic modeling. The results of this modeling were used in the design of the flood protection berms. During the construction phase of the project, erosion and sediment control measures would be

temporarily installed as required under the project's National Pollutant Discharge Elimination System General Permit for stormwater discharge associated with construction activity. The permanent stormwater management system will consist of ditches/swales in general areas and culverts under roadways draining to the retention basin. These measures will minimize the possibility of appreciable erosion and resulting sedimentation occurring on the site. The drainage plan for the plant site will be designed in accordance with Imperial County requirements and be designed to prevent flooding of permanent facilities by a 100-year, 24-hour storm event.

Pipeline Safety

The production and injection pipelines would have several design and operation features to assure their safety and reliability. During commissioning of the pipeline, plant startups, and following work on the production wells, great care is taken to ensure gradual heat up and controlled thermal expansion of the pipelines. Operational warmup procedures, including the use of flow control valves, would control the warmup rate of the pipelines to 50ºF per hour. Steam and fluid are recirculated from the plant back to the production well, slowly warming and pressurizing the pipeline prior to placing the well in service.

Plant operators would drive the pipeline routes daily to perform visual inspections. And nondestructive examinations would be performed semiannually in accordance with a preventive maintenance program and schedule.

Each production well would be equipped with two parallel electrically operated isolation valves, powered and wired to the plant control room. These valves are stroked shut and open regularly to remove accumulated scale and ensure consistent operation. The plant operator can shut these valves either manually or remotely, if necessary. The pipeline also would be equipped with isolation valves at the plant site that will be shut by operational staff in case of a leak.

Grounding, Cathodic Protection and Lightning Protection

Safety is imperative for site personnel and electrical equipment. The electrical system is protected against ground faults that result in unit ground potential rises. The station grounding system provides a path to dissipate unsafe ground fault currents and reduces the ground potential rise. The grounding conductor will be sized for sufficient capacity to reduce the most severe fault conditions to within allowable limits by reducing voltage gradients to remote earth. The ground grid spacing will be assessed to provide sufficient step and touch potentials throughout the site. Bare conductors would be installed below grade in a grid pattern. Each junction of the grid will be bonded together by either an exothermic welding process or mechanical connectors.

Ground grid impedance performed as part of the grounding study would be used to determine the necessary numbers of grounding electrodes and grid spacing to ensure safe step and touch potentials under fault conditions. The grounding conductor will bond the ground grid to the building steel and non-energized metallic parts of electrical

equipment. Isolated grounding conductors to the ground grid will be provided for sensitive control systems.

Cathodic protection for underground metallic piping and structures (except rebar) takes into account cathodic protection and grounding influences associated with any existing cathodic protection system to which the facility is adjacent and connected. Cathodic protection would be provided by an impressed current system, a sacrificial system, and protective coatings. Lightning protection would be furnished for buildings and structures in accordance with NFPA 78. Lightning protection for the switchyards would be in accordance with industry practice.

3.7 Project Objectives

It is the policy of the State of California (state) to encourage the use of geothermal resources for thermal power plants, wherever feasible, recognizing that such use has the potential of providing direct economic benefit to the public in the form of job creation, while helping to preserve limited fossil fuel resources and promoting air cleanliness (Public Resources Code, Section 800). The MBGP's project objectives are as follows:

Primary Objective

The project's primary objective is to develop, construct and operate a baseload renewable electrical generating facility that supports grid reliability and the state's goal for a transition to a 100 percent renewable energy and zero-carbon resource supply to end-use customers by 2045.

Related Objectives

1. To construct and operate an approximately 140 MW (net) baseload renewable electrical generating facility that utilizes geothermal resources.
2. Develop a renewable electrical generating facility that minimizes significant environmental impacts through the utilization of existing infrastructure, existing real property interests and rights-of-way, project design measures, and feasible mitigation measures.
3. Develop new incremental capacity from a facility eligible under the California Renewables Portfolio Standard (RPS) program with a capacity factor of at least 80 percent capable of satisfying the procurement requirements of California's utilities under the California Public Utilities Commission's (CPUC's) Mid-Term Reliability Decision 21-06-035 and subsequent decisions.
4. Develop an eligible renewable energy resource facility that can assist community choice aggregators, investor-owned utilities, and publicly owned utilities in meeting their RPS requirements.
5. Encourage the responsible development and revitalization of the Salton Sea KGRA region in a manner that benefits local and regional communities and tribes.

6. Create new, high-paying construction jobs, operations and maintenance jobs, and skilled trades and professional roles in Imperial County, California.

3.8 Land Use and Zoning

Site Land Use

Existing land uses at the proposed MBGP site are rural open space, recreational and geothermal production. Wetlands and seasonal wetlands are present in areas surrounding the parcel. Roadways surrounding the project site, including the direct access roadway, and bordering roadways, are unpaved roads.

The proposed MBGP is consistent with all applicable federal, state, and local plans and policies, and as such, there are no significant land use impacts associated with the execution of the project. The project is on land zoned (A-3-G) with a Geothermal Overlay, with a General Plan Land Use designation of Agricultural, and is therefore subject to applicable policies in the Imperial County General Plan. Per Imperial County Code Section § 90518.02, major geothermal projects that meet the requirements of Division 17 are conditionally permitted in the A-3 zoning. Further, the Geothermal Overlay overrules the Imperial County General Plan, as the Geothermal Overlay identifies the parcel as suitable for geothermal activities. The proposed project will not conflict with air navigation operations associated with Calipatria Municipal Airport.

Surrounding Land Uses

Agricultural uses dominate the overall area southeast of the Salton Sea. Existing surrounding land uses include industrial, agricultural, open space, recreational, residential, geothermal energy production, and equipment staging. The surrounding area consists of actively farmed fields as well as other geothermal plants in the area, including the Elmore Geothermal Facility immediately south of the site. The balance of industrial uses consists of surrounding existing geothermal plants.

Recreational and visual (scenic) resources and opportunities abound along the south shoreline of the Salton Sea; including such attractions as the Sonny Bono National Wildlife Refuge (NWR), open space enjoyment, fishing, and scenic vistas. Portions of the NWR are southwest of the project site, and involve hunting, fishing, and wildlife viewing via approximately 2,100 miles of trails and boardwalks. Open space lands with an Open Space/Recreational zoning designation are to the north, west, and south of the project site. Scenic resources are plentiful, although the project site is not within an Imperial County designated scenic resource protection area. There are no designated eligible scenic highways in the vicinity of the project. The Desert Renewable Energy Conservation Plan (DRECP) boundaries include the project site, but the site is not located on Bureau of Land Management lands or areas of Critical Environmental Concern; therefore, the DRECP is not applicable to the project.

Temporary lodging for duck hunters, camping at a nearby county park, and employee housing at the Sonny Bono NWR make up the nearby surrounding residential uses, however there are no residential zoned properties within the project study area. The nearest private residence is approximately three miles southwest of the project site.

While the Sonny Bono Salton Sea NWR provides intermittent educational programs to the public, there are no schools, child daycare facilities, or assisted living facilities/nursing homes within one mile of the proposed project. No religious facilities or places of worship are within one mile of the proposed project. No unique land uses, other than geothermal-related uses, have been identified within the project study area.

Important Farmland and Williamson Act

According to the California Department of Conservation's (DOC) Farmland Mapping and Monitoring Program (FMMP), surrounding designations of agricultural properties varies among Farmland of Statewide Importance, Urban and built-Up Land, and Other Land. FMMP designations for lands associated with the project's ancillary facilities, approximately four percent is Important Farmland, equating to approximately six acres of farmland of Statewide Importance along the associated gen-tie line to the IID switching station.

Imperial County does not participate in Williamson Act (WA) contracts and there are no active contracts within the county, the last WA contracts having expired in 2020, with no possibility for renewal. MBGP is consistent with land-use zoning in the County designated Geothermal Overlay Zone.

3.9 Facility Availability and Reliability

The MBGP, designed with an operational life of approximately 40 years, is expected to provide a high availability and be responsive to the needs of the system for power. Planned outages are anticipated to occur every three years in seasons when energy demand is relatively low.

Facility Reliability and Redundancy

Critical functions and parameters of the MBGP would have redundant sensors, controls, indicators, and alarms. The system will be designed such that critical controls and indications do not trip because of a failure in the control system implementation of redundancy logic. Control systems in general, and especially the protection systems, will be designed according to stringent failure criteria.

Measurement redundancy will be provided for all critical plant parameters. DCS microprocessors will be fully redundant with automatic tracking and switchover capability in case of primary microprocessor failure. Two fully redundant data communications networks will be provided, permitting either network to be disconnected and reconnected while the system remains online and in control. The control system will incorporate online self-diagnostic features to verify proper operation of system hardware, software, and

related support functions such as control power, field contact interrogating power, and the system modules in position.

Fuel (Geothermal Fluid) and Water Availability

Geothermal steam from the RPF would be the only fuel used by the STG. The wellfield for the MBGP is in known productive resource areas with indicated and measured resources that are near active operational geothermal wells, resulting in a high probability to classify the MBGP production wellfield as credible to proven production. It was later determined through resource availability studies that geothermal fluid is reliably sufficient in quantities to fuel MBGP operations (Jacobs 2023r, TN 250042). Use of pressure observation wells and ongoing reservoir modeling will be employed to manage the resource.

The source of water for the plant will be water from IID agricultural distribution canals. The IID is responsible for the operation and maintenance of the water supply system upstream of the water transfer point. Because this IID supply system is already in place, upgrades to the existing water supply system are expected to be minor. A buried pipeline will be installed to transfer the water either by gravity or via transfer pump system from the custody transfer point to the service water pond. (Jacobs 2023a)

3.10 Facility Closure

Facility closure can be either temporary or permanent and can result from one of two circumstances: (1) the facility is closed suddenly and/or unexpectedly because of unplanned circumstances, such as a natural disaster or other unexpected event; or (2) the facility is closed in a planned manner, such as at the end of its useful economic or mechanical life or because of gradual obsolescence. The two types of closure are discussed in the following subsections.

Temporary Closure

Temporary or unplanned closure can result from unforeseen circumstances, including natural disaster, terrorist attack, and economic forces. For a short-term unplanned closure, where there is no facility damage resulting in a hazardous substance release, the facility would be kept "as is," ready to restart operations when the unplanned closure event is rectified or ceases to restrict operations. If there is a possibility of hazardous substances release, the applicant will notify the appropriate agencies and follow appropriate emergency plans. All wastes (hazardous and nonhazardous) will be disposed of according to applicable LORS in effect at the time of the closure. Facility security will be retained so that the MBGP is secure from trespassers. Prior to the beginning of operations, the applicant will develop a contingency plan to deal with unplanned or unexpected plant closure. This plan will include the following elements:

- Taking immediate steps to secure the facility from trespassing and encroachment;
- Procedures for the safe shutdown and startup of equipment and procedures for dealing with hazardous materials, including draining of vessels and equipment and disposal of wastes, depending on the duration of the event;

- Communication with CEC and local authorities regarding the facility damage and compliance with LORS

Permanent Closure

The planned economic life of the MBGP facility is 40 years. However, if the facility were economically viable at the end of the 40-year operating period, it could continue to operate for a much longer period. As power plant operators continuously maintain the equipment up to industry standards, there is every expectation that the generation facility will have value beyond 40 years. It is also possible that the facility could become economically noncompetitive earlier than the planned power plant's 40-year useful life. Decommissioning activities will follow a decommissioning plan that will be developed and submitted to the CEC for review at least 12 months prior to planned facility closure. The permanent closure plan will include the following elements.

- Activities required to permanently close the facility;
- A listing of all applicable LORS and a plan to comply with them;
- Coordination with CEC and interested local authorities, including workshops, to coordinate closure activities;
- The maximization of recycling and other proper disposal methods, and
- The maintenance of site security, as required.

In case of permanent closure, the facility will be cleaned, and the facility components will be salvaged to the greatest extent possible. Cleaning will consist of removal of scale from piping and equipment walls (primarily fluid-handling piping and equipment) and the removal of sludge from the primary and secondary clarifiers, and "clean closing" the Brine Pond and the cooling tower basin. All solids will be tested. Those found to be hazardous will be transferred to a permitted Class I landfill. Nonhazardous wastes will be transferred to a permitted Class II or Class III landfill as appropriate for each waste. These solids will be managed and disposed of properly so as not to cause significant environmental or health and safety impacts. Under permanent closure, the wells will be abandoned with proper certification using CalGEM procedures and the brine pond will be "clean closed" in accordance with the RWQCB waste discharge requirements.

3.11 References

Jacobs 2023a – Jacobs (TN 249723). Morton Bay Geothermal Project Application for Certification, Volume 1, dated April 18, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Jacobs 2023r – Jacobs (TN 250042). Morton Bay Geothermal Project Adequacy Report, dated May 8, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Jacobs 2023kk – Jacobs (TN 253188). Morton Bay Geothermal Project Revised General Arrangement Refinement, dated November 17, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Jacobs 2023f – Jacobs (TN 249728). Morton Bay Geothermal Project AFC Appendix 2, Project Description, dated April 18, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Section 4

Engineering Evaluation

4 Engineering Evaluation

The purpose of this analysis is to ensure that the project would be built to applicable engineering codes, ensure public health and safety, and verify that applicable engineering LORS have been identified. This analysis also evaluates the applicant's proposed design criteria, describes the design review and construction inspection process, and establishes conditions of certification that would monitor and ensure compliance with engineering LORS and any other special design requirements. These conditions allow both the California Energy Commission (Energy Commission) compliance project manager (CPM) and the applicant to adopt a compliance monitoring program that will verify compliance with these LORS.

4.1 Facility Design

Kenneth Salyphone

4.1.1 Setting

Morton Bay Geothermal Project (MBGP or project) proposes to construct and operate a geothermal power plant with net capacity of 140 megawatts. The project would be in the Imperial Valley, Imperial County. The site would occupy approximately 63 acres of a 160-acre parcel within the unincorporated area of Imperial County and will lie in seismic zone 4. For more information on the site and related project description, please see the Project Description section of this document.

Regulatory

Federal

None.

State

California Building Standards Code 2022 (or the latest edition in effect) (also known as Title 24, California Code of Regulations). The California Building Standards Code applies to the planning, design, operation, construction, use, and occupancy of power plants and their ancillary facilities.

Local

Imperial County Seismic & Public Safety. The County's General Plan Seismic & Public Safety Element is intended to minimize the risks associated natural and human-made hazards, and to promote public safety and welfare by reducing the risk of life loss or injury from the effects of disaster or accident (Imperial County 2023).

4.1.2 Impacts

Facility Design encompasses the civil, structural, mechanical, and electrical engineering design of the project. The purpose and subject of this analysis is to:

- Verify that the laws, ordinances, regulations, and standards (LORS) applicable to the engineering design and construction of the project have been identified;
- Verify that the project and ancillary facilities have been described in sufficient detail upon review and approval of the California Energy Commission's (CEC) Delegate Chief Building Official (DCBO), including proposed design criteria and analysis methods;
- Through the DCBO's review and approval process, provide reasonable assurance that the project can be designed and constructed in accordance with all applicable engineering LORS, and in a manner that assures public health and safety;

- Through the DCBO's oversight and approval process, determine whether special design features should be considered during final design to deal with conditions unique to the site which could affect public health and safety; and,
- Describe the design review and construction inspection process and establish conditions of certification (COCs) that will be used to monitor and ensure compliance with the engineering LORS and any special design requirements.

4.1.3 Applicable LORS and Project Conformance

Table 4.1-1 staff's determination of conformance with applicable local, state and federal LORS, including any proposed COCs, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific COCs, the proposed project would be consistent with all applicable LORS. The subsection below, "4.1.5 Staff Proposed Conditions of Certification," contains the full text of the referenced COCs.

TABLE 4.1-1 COMPLIANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
State	
California Building Standards Code 2022 (or the latest edition in effect) (also known as Title 24, California Code of Regulations)	**Yes**. With implementation of COCs **GEN-1** through **GEN-8, CIVIL-1** through **CIVIL-4, STRUC-1** through **STRUC-4, MECH-1** through **MECH-3,** and **ELEC-1**
Local	
Imperial County Seismic & Public Safety	**Yes**. With implementation of COCs **CIVIL-1** and **CIVIL-4**, and **STRUC-1** through **STRUC-4**
General	
Air Moving and Conditioning Association (AMCA) American Concrete Institute (ACI) Codes American Institute of Steel Construction (AISC) Codes American National Standards Institute (ANSI) Codes American Society of Civil Engineers (ASCE) Codes American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code American Society of Testing and Materials (ASTM) Codes American Welding Society (AWS) ASME Performance Test Codes ASME TDP-1 Prevention of Water Damage to Steam Turbines ASME/ANSI B31.1 Power Piping Code Concrete Reinforcing Steel Institute (CRSI) Codes Cooling Tower Institute (CTI) Heat Exchange Institute (HEI) National Electric Safety Code (NESC)	**Yes**. With implementation of COCs **CIVIL-1** through **CIVIL-4**, **STRUC-1** through **STRUC-4**, **MECH-1** through **MECH-3**, and **ELEC-1**

TABLE 4.1-1 COMPLIANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
National Fire Protection Association (NFPA Standards) Occupational Safety and Health Administration (OSHA) Steel Deck Institute (SDI) – Design Manual for Floor Decks and Roof Decks Underwriters Laboratories, Inc. (UL)	

4.1.4 Conclusions and Recommendations

CEC staff concludes that the design and construction of the project, its linear facilities, including transmission lines, water pipelines, conveyance pipelines, and the wellfield, would comply with the applicable engineering LORS.

The proposed COCs would ensure that the proposed is designed and constructed in accordance with applicable engineering LORS. This would be accomplished through design review, plan checking, and field inspections that would be performed by the DCBO. CEC staff would oversee the DCBO's work to ensure satisfactory performance.

4.1.5 Proposed Conditions of Certification

The following proposed COCs include both measures to mitigate environmental impacts and ensure conformance with applicable LORS.

GEN-1 The project owner shall design, construct, and inspect the project in accordance with the 2022 California Building Standards Code (CBSC), also known as Title 24, California Code of Regulations, which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and all other applicable engineering LORS in effect at the time initial design plans are submitted to the DCBO for review and approval (the CBSC in effect is the edition that has been adopted by the California Building Standards Commission and published at least 180 days previously). The project owner shall ensure that all the provisions of the above applicable codes are enforced during the construction, addition, alteration, moving (onsite), demolition, repair, or maintenance of the completed facility.

In the event that the initial engineering designs are submitted to the DCBO when the successor to the 2022 CBSC is in effect, the 2022 CBSC provisions shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

The project owner shall ensure that all contracts with contractors, subcontractors, and suppliers clearly specify that all work performed and materials supplied comply with the codes listed above.

Verification: Within 30 days following receipt of the certificate of occupancy (CofO), the project owner shall submit to the Compliance Project Manager (CPM) a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation, and inspection requirements of the applicable LORS and the CEC's decision have been met in the area of Facility Design. The project owner shall provide the CPM a copy of the CofO within 30 days of receipt from the DCBO.

Once the CofO has been issued, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed facility that requires DCBO approval for compliance with the above codes. The CPM will then determine if the DCBO needs to approve the work.

GEN-2 Before submitting the initial engineering designs for DCBO review, the project owner shall furnish the CPM and the DCBO with a schedule of facility design submittals, and master drawings and master specifications list. The master drawings and master specifications list shall contain a list of proposed submittal packages of designs, calculations, and specifications for major structures, systems, and equipment. Major structures, systems, and equipment are structures and their associated components or equipment that are necessary for power production, costly or time consuming to repair or replace, are used for the storage, containment, or handling of hazardous or toxic materials, or could become potential health and safety hazards if not constructed according to applicable engineering LORS. The schedule shall contain the date of each submittal to the DCBO. To facilitate audits by CEC staff, the project owner shall provide specific packages to the CPM upon request.

Verification: At least 60 days (or a project owner- and DCBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the DCBO and to the CPM the schedule, and the master drawings and master specifications list of documents to be submitted to the DCBO, for review and approval. These documents shall be the pertinent design documents for the major structures, systems, and equipment defined above in COC **GEN-2**. Major structures and equipment shall be added to or deleted from the list only with CPM approval. The project owner shall provide schedule updates in the monthly compliance report (MCR)

GEN-3 The project owner shall make payments to the DCBO (the CEC) for design review, plan checks, construction inspections, and other applicable DCBO activities, based upon a reasonable fee schedule to be negotiated between the project owner and the DCBO. If the CEC delegates the DCBO function to a third party or local agency,

the project owner, at the CEC's direction, shall make payments directly to the DCBO based upon a fee schedule negotiated between the CEC and the DCBO. These fees may be consistent with the fees listed in the 2022 CBC, adjusted for inflation and other appropriate adjustments; may be based on the value of the facilities reviewed; may be based on hourly rates; or may be otherwise agreed upon by the project owner and the DCBO.

Verification: The project owner shall make the required payments to the DCBO (the CEC) in accordance with the agreement between the project owner and the DCBO (the CEC). If the CEC delegates the DCBO function to a third party or local agency, the project owner, at the CEC's direction, shall make payments directly to the DCBO based upon a fee schedule negotiated between the CEC and the DCBO. The project owner shall send a copy of the DCBO's receipt of payment to the CPM in the next MCR indicating that applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California-registered architect, or a structural or civil engineer, as the resident engineer (RE) in charge of the project.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project, respectively. A project may be divided into parts, provided that each part is clearly defined as a distinct unit. Separate assignments of general responsibility may be made for each designated part.

The RE shall:

1. Monitor progress of construction work requiring DCBO design review and inspection to ensure compliance with LORS;
2. Ensure that construction of all facilities subject to DCBO design review and inspection conforms in every material respect to applicable LORS, these COCs, approved plans, and specifications;
3. Prepare documents to initiate changes in approved drawings and specifications when either directed by the project owner or as required by the conditions of the project;
4. Be responsible for providing project inspectors and testing agencies with complete and up-to-date sets of stamped drawings, plans, specifications, and any other required documents;
5. Be responsible for the timely submittal of construction progress reports to the DCBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and

6. Be responsible for notifying the DCBO of corrective action or the disposition of items noted on laboratory reports or other tests when they do not conform to approved plans and specifications.

The resident engineer (or his delegate) must be located at the project site or be available at the project site within a reasonable time, during any hours in which construction takes place.

The RE shall have the authority to halt construction and to require changes or remedial work if the work does not meet requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications, and registration number of the newly assigned engineer to the DCBO for review and approval. The project owner shall notify the CPM of the DCBO's approval of the new engineer.

Verification: At least 30 days (or project owner- and DCBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the DCBO for review and approval, the resume and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the DCBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) is subsequently reassigned or replaced, the project owner has five days to submit the resume and registration number of the newly assigned engineer to the DCBO for review and approval. The project owner shall notify the CPM of the DCBO's approval of the new engineer within five days of the approval.

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: a civil engineer; a soils, geotechnical, or civil engineer experienced and knowledgeable in the practice of soils engineering; and an engineering geologist. Prior to the start of construction, the project owner shall assign at least one of each of the following California registered engineers to the project: a design engineer who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; a mechanical engineer; and an electrical engineer. (California Business and Professions Code sections 6704, 6730, 6731, and 6736 require state registration to practice as a civil engineer or structural engineer in California).

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (for example, proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project

shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

The project owner shall submit to the DCBO for review and approval, the names, qualifications, and registration numbers of all responsible engineers assigned to the project.

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible engineer to the DCBO for review and approval. The project owner shall notify the CPM of the DCBO's approval of the new engineer.

A. The civil engineer shall:

1. Review the foundation investigations, geotechnical, or soils reports prepared by the soils engineer, the geotechnical engineer, or by a civil engineer experienced and knowledgeable in the practice of soils engineering;
2. Design (or be responsible for the design of), stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities requiring design review and inspection by the DCBO. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads, and sanitary sewer systems; and
3. Provide consultation to the RE during the construction phase of the project and recommend changes in the design of the civil works facilities and changes to the construction procedures.

B. The soils engineer, geotechnical engineer, or civil engineer experienced and knowledgeable in the practice of soils engineering, shall:

1. Review all the engineering geology reports;
2. Prepare the foundation investigations, geotechnical, or soils reports containing field exploration reports, laboratory tests, and engineering analysis detailing the nature and extent of the soils that could be susceptible to liquefaction, rapid settlement, or collapse when saturated under load;
3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with requirements set forth in the 2022 CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both); and
4. Recommend field changes to the civil engineer and RE.

This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform to the predicted conditions used as the basis for design of earthwork or foundations.

C. The engineering geologist shall:

1. Review all the engineering geology reports and prepare a final soils grading report; and
2. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 2022 CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both).

D. The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;
2. Provide consultation to the RE during design and construction of the project;
3. Monitor construction progress to ensure compliance with engineering LORS;
4. Evaluate and recommend necessary changes in design; and
5. Prepare and sign all major building plans, specifications, and calculations.

E. The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the DCBO, stating that the proposed final design plans, specifications, and calculations conform to all of the mechanical engineering design requirements set forth in the CEC's decision.

F. The electrical engineer shall:

1. Be responsible for the electrical design of the project; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or project owner- and DCBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the DCBO for review and approval, resumes and registration numbers of the responsible civil engineer, soils (geotechnical) engineer, and engineering geologist assigned to the project.

At least 30 days (or project owner- and DCBO-approved alternative time frame) prior to the start of construction, the project owner shall submit to the DCBO for review and approval, resumes and registration numbers of the responsible design engineer, mechanical engineer, and electrical engineer assigned to the project.

The project owner shall notify the CPM of the DCBO's approvals of the responsible engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the resume and registration number of the newly assigned engineer to the DCBO for review and approval. The project owner shall notify the CPM of the DCBO's approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, including prefabricated assemblies, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 2022 CBC.

A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the DCBO, for inspection of the particular type of construction requiring special or continuous inspection;
2. Inspect the work assigned for conformance with the approved design drawings and specifications;
3. Furnish inspection reports to the DCBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the DCBO and the CPM for corrective action; and
4. Submit a final signed report to the RE, DCBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans, specifications, and other provisions of the applicable edition of the CBC.

Verification: At least 15 days (or project owner- and DCBO-approved alternative time frame) prior to the start of an activity requiring special inspection, the project owner shall submit to the DCBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the DCBO's approval of the qualifications of all special inspectors in the next MCR.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the DCBO for approval. The project owner shall notify the CPM

of the DCBO's approval of the newly assigned inspector within five days of the approval.

GEN-7 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone DCBO design review and approval, the project owner shall document the discrepancy and recommend required corrective actions. The discrepancy documentation shall be submitted to the DCBO for review and approval. The discrepancy documentation shall reference this COC and, if appropriate, applicable sections of the CBC and/or other LORS.

Verification: The project owner shall transmit a copy of the DCBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next MCR. If any corrective action is disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval and the revised corrective action to obtain DCBO's approval.

GEN-8 The project owner shall obtain the DCBO's final approval of all completed work that has undergone DCBO design review and approval. The project owner shall request the DCBO to inspect the completed structure and review the submitted documents. The project owner shall notify the CPM after obtaining the DCBO's final approval. The project owner shall retain one set of approved engineering plans, specifications, and calculations (including all approved changes) at the project site, or at another accessible location, during the operating life of the project. Electronic copies of the approved plans, specifications, calculations, and marked-up as-built shall be provided to the DCBO for retention by the CPM.

Verification: Within 15 days of the completion of any work, the project owner shall submit to the DCBO, with a copy to the CPM in the next MCR, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans. After storing the final approved engineering plans, specifications, and calculations described above, the project owner shall submit to the CPM a letter stating both that the above documents have been stored and the storage location of those documents.

Within 90 days of the completion of construction, the project owner shall provide to the DCBO three sets of electronic copies of the above documents at the project owner's expense. These are to be provided in the form of "read only" (Adobe .pdf 6.0 or newer version) files, with restricted (password-protected) printing privileges, on archive quality compact discs.

CIVIL-1 The project owner shall submit to the DCBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. A construction storm water pollution prevention plan (SWPPP);

4. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
5. Soils, geotechnical, or foundation investigations reports required by the 2022 CBC.

Verification: At least 15 days (or project owner- and DCBO-approved alternative time frame) prior to the start of site grading the project owner shall submit the documents described above to the DCBO for design review and approval. In the next MCR following the DCBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the DCBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible soils engineer, geotechnical engineer, or the civil engineer experienced and knowledgeable in the practice of soils engineering, identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications, and calculations to the DCBO based on these new conditions. The project owner shall obtain approval from the DCBO before resuming earthwork and construction in the affected area.

Verification: The project owner shall notify the CPM within 24 hours when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within 24 hours of the DCBO's approval to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the DCBO's approval.

CIVIL-3 The project owner shall perform inspections in accordance with the 2022 CBC. All plant site-grading operations, for which a grading permit is required, shall be subject to inspection by the DCBO.

If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the DCBO, and the CPM. The project owner shall prepare a written report, with copies to the DCBO and the CPM, detailing all discrepancies, non-compliance items, and the proposed corrective action.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the DCBO and the CPM a non-conformance report (NCR), and the proposed corrective action for review and approval. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the DCBO and the CPM. A list of NCRs for the reporting month shall also be included in the following MCR.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage work, the project owner shall obtain the DCBO's approval of the final grading plans (including final changes) for the erosion and sedimentation control

work. The civil engineer shall state that the work within his/her area of responsibility was done in accordance with the final approved plans.

Verification: Within 30 days (or project owner- and DCBO-approved alternative time frame) of the completion of the erosion and sediment control mitigation and drainage work, the project owner shall submit to the DCBO, for review and approval, the final grading plans (including final changes) and the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes. The project owner shall submit a copy of the DCBO's approval to the CPM in the next MCR.

STRUC-1 Prior to the start of any increment of construction, the project owner shall submit plans, calculations, and other supporting documentation to the DCBO for design review and acceptance for all project structures and equipment identified in the DCBO-approved master drawing and master specifications list. The design plans and calculations shall include the lateral force procedures and details as well as vertical calculations.

Construction of any structure or component shall not begin until the DCBO has approved the lateral force procedures to be employed in designing that structure or component. The project owner shall:

1. Obtain approval from the DCBO of lateral force procedures proposed for project structures;
2. Obtain approval from the DCBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (for example, highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications;
3. Submit to the DCBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation;
4. Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations, and specifications shall be signed and stamped by the responsible design engineer; and
5. Submit to the DCBO the responsible design engineer's signed statement that the final design plans conform to applicable LORS.

Verification: At least 30 days (or project owner- and DCBO-approved alternative time frame) prior to the start of any increment of construction of any structure or component listed in the DCBO-approved master drawing and master specifications list, the project owner shall submit to the DCBO the above final design plans, specifications and calculations, with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM, in the next MCR, a copy of a statement from the DCBO that the proposed structural plans, specifications, and calculations have been approved and comply with the requirements set forth in applicable engineering LORS.

STRUC-2 The project owner shall submit to the DCBO the required number of sets of the following documents related to work that has undergone DCBO design review and approval:

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);
2. Concrete pour sign-off sheets;
3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);
4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and
5. Reports covering other structural activities requiring special inspections shall be in accordance with the 2022 CBC.

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit a NCR describing the nature of the discrepancies and the proposed corrective action to the DCBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the COCs and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the DCBO and the CPM.

The project owner shall transmit a copy of the DCBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval, and the revised corrective action to obtain DCBO's approval.

STRUC-3 The project owner shall submit to the DCBO design changes to the final plans required by the 2022 CBC, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give to the DCBO prior notice of the intended filing.

Verification: On a schedule suitable to the DCBO, the project owner shall notify the DCBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above- mentioned documents to the DCBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the MCR, when the DCBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in the 2022 CBC shall, at a minimum, be designed to comply with the requirements of that chapter.

Verification: At least 30 days (or project owner- and DCBO-approved alternate time frame) prior to the start of installation of the tanks or vessels containing the above specified quantities of toxic or hazardous materials, the project owner shall submit to the DCBO for design review and approval final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the DCBO approvals of plan checks to the CPM in the MCR following receipt of such approvals. The project owner shall also transmit a copy of the DCBO's inspection approvals to the CPM in the MCR following completion of any inspection.

MECH-1 The project owner shall submit, for DCBO design review and approval, the proposed final design, specifications, and calculations for each plant major piping and plumbing system listed in the DCBO-approved master drawing and master specifications list. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the DCBO's inspection approval of that construction.

The responsible mechanical engineer shall stamp and sign all plans, drawings, and calculations for the major piping and plumbing systems, subject to DCBO design review and approval, and submit a signed statement to the DCBO when the proposed piping and plumbing systems have been designed, fabricated, and installed in accordance with all of the applicable LORS , which may include, but are not limited to:

- American National Standards Institute (ANSI) B31.1 (Power Piping Code);
- ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
- ANSI B31.8 (Gas Transmission and Distribution Piping Code);
- ASME TDP-1 (Prevention of Water Damage to Steam Turbines);
- NACE SP0169-2013 (Control of External Corrosion on Underground or Submerged Metallic Piping Systems;

- NACE SP187-2017 (Design for Corrosion Control of Reinforcing Steel in Concrete);
- NFPA 56 (Standard for Fire and Explosion Prevention During Cleaning and Purging of Flammable Gas Piping Systems);
- NFPA 70B (Practices for Electrical Equipment Maintenance—to reduce hazard to life safety)
- Title 24, California Code of Regulations, Part 5 (California Plumbing Code);
- Title 24, California Code of Regulations, Part 6 (California Energy Code, for building energy conservation systems and temperature control and ventilation systems); and
- Title 24, California Code of Regulations, Part 2 (California Building Code).

The DCBO may deputize inspectors to carry out the functions of the CEC's code enforcement mandate.

Verification: At least 30 days (or project owner- and DCBO-approved alternative time frame) prior to the start of any increment of major piping or plumbing construction listed in the DCBO-approved master drawing and master specifications list, the project owner shall submit to the DCBO for design review and approval the final plans, specifications, and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with applicable LORS, and shall send the CPM a copy of the transmittal letter in the next MCR.

The project owner shall transmit to the CPM, in the MCR following completion of any inspection, a copy of the transmittal letter conveying the DCBO's inspection approvals.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the DCBO, prior to operation, the code certification papers, and other documents required by applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the DCBO inspection of that installation.

The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated, and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and
2. Have the responsible design engineer submit a statement to the DCBO that the proposed final design plans, specifications, and calculations conform to the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

Verification: At least 30 days (or project owner- and DCBO-approved alternative time frame) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the DCBO for design review and approval, the above listed documents, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall transmit to the CPM, in the MCR following completion of any inspection, a copy of the transmittal letter conveying the DCBO's inspection approvals.

MECH-3 The project owner shall submit to the DCBO for design review and approval the design plans, specifications, calculations, and quality control procedures for any heating, ventilating, air conditioning (HVAC) or refrigeration system.

Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the CBC and other applicable codes. Upon completion of any increment of construction, the project owner shall request the DCBO's inspection and approval of that construction. The final plans, specifications and calculations shall include approved criteria, assumptions, and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the DCBO that the proposed final design plans, specifications and calculations conform with the applicable LORS.

Verification: At least 30 days (or project owner- and DCBO-approved alternative time frame) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the DCBO the required HVAC and refrigeration calculations, plans, and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

ELEC-1 Prior to the start of any increment of electrical construction for all electrical equipment and systems 110 Volts or higher (see a representative list, below) the project owner shall submit, for DCBO design review and approval, the proposed final design, specifications, and calculations. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the DCBO inspect the installation to ensure compliance with the requirements of applicable LORS.

A. Final plant design plans shall include:

1. one-line diagram for the 13.1 kV, 4.16 kV and 480 V systems;

2. system grounding drawings;
3. lightning protection system; and
4. hazard area classification plan.

B. Final plant calculations must establish:

1. short-circuit ratings of plant equipment;
2. ampacity of feeder cables;
3. voltage drop in feeder cables;
4. system grounding requirements;
5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.1 kV, 4.16 kV and 110/480 V systems;
6. system grounding requirements;
7. lighting energy calculations; and
8. 110-Volt system design calculations and submittals showing feeder sizing, transformer and panel load confirmation, fixture schedules and layout plans.

C. The following activities shall be reported to the CPM in the MCR:

1. Receipt or delay of major electrical equipment;
2. Testing or energizing of major electrical equipment; and
3. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the CEC decision.

Verification: At least 30 days (or project owner- and DCBO-approved alternative time frame) prior to the start of each increment of electrical construction, the project owner shall submit to the DCBO for design review and approval the above listed documents.

The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS and shall send the CPM a copy of the transmittal letter in the next MCR.

4.1.6 References

Imperial County 2023 – Imperial County. Planning & Development Services. Noise Element. Imperial County General Plan. Accessed on December 15, 2023. Available online at: https://www.icpds.com/planning/land-use-documents/general-plan/seismic-and-public-safety

Jacobs 2023a – Jacobs (TN 249723). Morton Bay Geothermal Project Application for Certification, Volume 1, dated April 18, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

4.2 Facility Reliability

Ardalan R. Sofi

4.2.1 Setting

This analysis evaluates the proposed Morton Bay Geothermal Project (MBGP or project) to determine if the power generating facility would be built in accordance with typical industry norms for reliable power generation.

Regulatory

No Federal, State or local/county laws, ordinances, regulations, or standards apply to power generating facility reliability.

4.2.2 Impacts

Reliability can be considered a combination of a power plant's ability to generate power and the ability to minimize starting failures and forced outages, making a reliable power plant one that is available when called upon to operate. Power plant systems must be able to operate for extended periods without shutting down for maintenance or repairs and must achieve an availability factor similar to the existing power plant facilities in the California electricity grid system. To achieve this, this reliability analysis encompasses the following benchmarks and ensures that the project would not degrade the overall reliability of the electric system it serves.

- equipment availability;
- plant maintainability and maintenance program;
- fuel availability; and
- power plant reliability in relation to natural hazards.

Equipment Availability

Equipment availability would be ensured by adopting appropriate quality assurance/quality control (QA/QC) procedures during the plant's design, procurement, construction, and operation and by providing adequate maintenance and repair of the project equipment and systems.

QA/QC Procedures

The applicant describes QA/QC procedures (Jacobs 2023a, Section 2.4.2.7) that are typical of the power industry. The operational plan would require the facility to perform and record periodic operational checks and tests of equipment in accordance with approved maintenance procedures and the equipment manufacturers' specifications (Jacobs 2023a, Section 2.4.2.7). The project may subcontract specialized vendors as needed during planned outages, inspections, and overhauls. The project would be subject

to regular inspection. Implementation of this program would help ensure the goal of operational equipment reliability (Jacobs 2023a, Section 2.4.2.7).

Equipment Redundancy

A power generating facility must be capable of being maintained while operating. A typical approach to this is to provide redundant examples of pieces of equipment that are most likely to require service or repair.

The applicant proposes to provide an appropriate redundancy of function for the project. For example, the lube oil system of the steam turbine generator benefits from redundant pumps, filters, and coolers which are designed to prevent damage and extend the lifespan of these key components (Jacobs 2023a, Section 2.4.2.2). Also, the MBGP instrument air system comes equipped with redundant components, including an electric-driven air compressor, air dryer, air receiver, headers, and piping. Additionally, the project would incorporate a standby air compressor and ancillary equipment, all set to ensure the constant supply of air to the instruments and control devices. The project's fire safety measures incorporate a primary fire pump with a backup diesel-powered pump, ensuring personnel and equipment safety (Jacobs 2023a, Section 2.4.2).

Furthermore, the proposed MBGP systems and equipment would rely on a microprocessor-based control system with redundant architecture to ensure seamless and safe operation even during maintenance cycles. Similarly, redundancy is built into the critical measurement sensors to ensure the precision of power plant monitoring system. CEC staff concludes that the proposed project incorporates sufficient equipment redundancy to allow continued operation, despite the possibility of equipment failure.

Plant Maintainability and Maintenance Program

Equipment manufacturers provide maintenance recommendations for their products, and power plant owners develop their plant's maintenance program based on those recommendations. Such a program encompasses both preventive and predictive maintenance techniques. MBGP would develop its maintenance program in the same way (Jacobs 2023a, Section 2.4.2.7). Moreover, MBGP would implement a computerized maintenance management system (CMMS) for overseeing preventive maintenance, predictive maintenance, corrective maintenance, and outage handling.

This maintenance management system would contribute to the operational efficiency of the project by adopting a comprehensive approach. This approach would include preventive maintenance by periodically inspecting equipment to avoid their deterioration; predictive maintenance by utilizing systematic monitoring and historical data to anticipate potential issues; corrective maintenance to promptly restore equipment to its operational state by leveraging past failure data to prevent recurrent issues; and outage handling plans to manage downtimes by collaborating with equipment manufacturers for timely inspections and resource allocation (Jacobs 2023a, Section 2.4.2.7). In light of the manufacturers' maintenance recommendations and the applicant's CMMS, the project would be adequately maintained to ensure an acceptable level of reliability.

Fuel Availability

The long-term availability of fuel is necessary to ensure the reliability of any power plant. The need for reliable sources of fuel is obvious; lacking long-term availability of it, the service life of the plant could be curtailed, threatening the power supply.

MBGP would generate electricity through the utilization of geothermal resources available at the Salton Sea Known Geothermal Resource Area (KGRA). According to the project resource adequacy report provided by the applicant, sufficient resources exist to supply the project for its designed life cycle (Jacobs 2023r). Furthermore, staff consulted with the California Department of Conservation, Geologic Energy Management Division (CalGEM), which has expertise in geothermal fields. Based on this consultation, it is evident that historically, the geothermal production wells have maintained pressure for decades with minimal loss. The geothermal resource evaluation prepared by the CalGEM concluded that there is adequate geothermal resource in the region to support the proposed BHE Renewables, LLC projects (Black Rock, Elmore North, Morton Bay) with a cumulative capacity of 357 net MW for 30 years (CDOC 2023a). Therefore, staff expects BRGP to maintain adequate geothermal resources for the project's life.

Moreover, ultra-low sulfur diesel would be used for four emergency standby diesel-fueled generators (gensets) to support the critical facility load in case of a power interruption (Jacobs 2023a, Section 5.1.7.1.2, and Jacobs 2023kk). Since the gensets would operate only during routine testing and maintenance, which is limited to 50 hours per genset annually, the project's use of diesel would constitute a small fraction of available resources in California, and the state's supply is more than sufficient to meet necessary demand. Therefore, staff concludes there would be adequate fuel supply to meet the project's needs.

Power Plant Reliability in Relation to Natural Hazards

Natural forces can threaten the reliable operation of a power plant. Tsunamis (tidal waves) and Seiches (waves in inland bodies of water) are not likely to present hazards for this project (Jacobs 2023a, Section 5.4.1.5.7). However, seismic shaking (earthquakes), and flooding could present credible threats to the project's reliable operation.

Seismic Shaking

The proposed project would lie within an area known for seismic activity (Jacobs 2023a, Section 5.4.1); see **Section 5.6 Geology, Paleontology, and Minerals**. MBGP is primarily threatened by intense ground shaking during earthquakes, with ground conditions and proximity to the earthquake source intensifying these impacts. However, the possibility of ground rupture along an active fault at the MBGP site is deemed low. Also, the project would be designed and constructed to meet the latest applicable engineering codes. Compliance with the latest seismic design requirements represents an upgrading of performance during seismic shaking compared to older facilities since these requirements have been continually upgraded and made more stringent. Because the

project would be built to the latest seismic design requirements, it would be expected to perform better than the older existing power plants in California electricity grid system.

CEC staff has proposed Conditions of Certification (COCs) to ensure the project compliance with these requirements; see COC **GEO-2** (obtaining a grading permit) in **Section 5.6 Geology, Paleontology, and Minerals** and COCs **GEN-1** (final design, construction, and on-site inspection of the project) and **GEN-5** (requiring registered engineers to oversee design and construction of the project) in **Section 4.1 Facility Design**. These COCs include standard engineering design requirements for mitigation of strong seismic shaking, liquefaction, and potential excessive settlement due to dynamic compaction. Therefore, staff concludes the aforementioned COCs adequately mitigate potentially significant impacts associated with the project's functional reliability due to seismic shaking; therefore, COCs for Facility Reliability are not needed.

Flood Plain

According to the Imperial County General Plan, the proposed project site is in the Federal Emergency Management Agency's (FEMA's) 100-year flood zone (Jacobs 2023a, Section 2.3.3.6.17). However, based on the hydraulic modeling conducted by the applicant, the MBGP would no longer be within the FEMA 100-year flood zone due to the extensive changes in the Salton Sea elevation in recent years; thus, flood protection would not be required. Accordingly, the applicant submitted a letter of map revision to FEMA requesting revisions to 100-year flood elevation (Jacobs 2023bb). To further mitigate any flood hazard, the entire project site would be protected by the installation of a berm (Jacobs 2023a, Section 5.15.1.8). This berm would be constructed to a sufficient height to ensure flood protection up to an elevation of at least 223.80 feet below mean sea level (Jacobs 2023a, Section 5.15.2.4.2). The project features would be designed and built to provide adequate levels of flood resistance by complying with COCs **Water-6** (compliance with floodproofing criteria of Imperial County Flood Damage Prevention Regulation) in **Section 5.16 Water Resources**, and **CIVIL-1** (delegate chief building official (DCBO) approved drainage, grading, erosion control, and storm water plans, alongside civil engineer-signed specifications and calculations), and **CIVIL-4** (DCBO approved grading plans for the erosion and sedimentation control work) in **Section 4.1 Facility Design**. CEC staff concludes the above-mentioned COCs would adequately mitigate significant impacts associated with the project's functional reliability due to the potential for flooding.

Seiches

A wave created by an earthquake shaking in an enclosed body of water is called a seiche. The possibility may exist for a seiche to occur in the Salton Sea; see **Section 5.6 Geology, Paleontology, and Minerals**. The project site is on flat land, approximately two miles away from the Salton Sea with an approximate elevation of 240 feet below mean sea level (Jacobs 2023a, Section 5.4.1.5.7). Given the distance, seiches are unlikely to pose any hazard to the project. Moreover, there are no records of seiches occurring during recent earthquakes in the Imperial Valley. The construction of a berm around the

entire facility not only serves to mitigate flood hazards but also provides protection against seiches. Therefore, CEC staff concludes there would be no significant impact to the project's functional reliability due to seiches.

Comparison with Existing Facilities

Industry statistics for availability factors (as well as many other related reliability data) are kept by the North American Electric Reliability Council (NERC). The availability factor of a power plant is the amount of time that it is able to produce electricity over a certain period, divided by the amount of the time in the period. NERC continually polls utility companies throughout the North American continent on project reliability data through its Generating Availability Data System (GADS), and periodically summarizes and publishes the statistics. The latest NERC statistics reported the availability factor for existing geothermal units in its Generating Unit Statistical Brochure 1 - 2022 - Units Reporting Events (NERC 2023). According to that data, the availability factor for all geothermal units is 95 percent. Applicant has predicted an average availability of 95 percent or higher for MBGP (Jacobs 2023a, Section 1.4).

The triple-pressure, condensing steam turbine technology proposed for the project has been on the market for many years now and can be expected to exhibit typically high availability. The brine handling and treatment technology to be employed in MBGP has a proven record of reliability. The applicant's predicted availability factor appears reasonable compared to the NERC figure for similar plants throughout North America (see above). Technological advancements, as well as redundancy as illustrated above, have led to extremely high reliability for the steam turbine generator considered for this project. Maintenance can be scheduled during those times of year when the full plant output is not required to meet market demand, typical of industry standard maintenance procedures; therefore, the applicant's estimate of plant availability appears accurate. The stated procedures for assuring design, procurement, and construction of a reliable power plant are consistent with standard industry practices; therefore, staff concludes they would meet current reliability standards.

4.2.3 Applicable LORS and Project Conformance

No federal, state or local/county laws, ordinances, regulations, or standards apply to power plant reliability.

4.2.4 Conclusions and Recommendations

CEC staff concludes that MBGP would be built to operate in a manner consistent with industry norms for reliable operation and would be expected to demonstrate an equivalent availability factor of 95 percent, which is an acceptable level of availability. The proposed geothermal power plant would perform reliably and would not adversely affect project reliability.

4.2.5 Proposed Conditions of Certification

There are no proposed conditions of certification for Facility Reliability.

4.2.6 References

CDOC 2023a – California Department of Conservation (TN 250207). Geothermal Resource Evaluation, dated May 18, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Jacobs 2023a – Jacobs (TN 249723). Morton Bay Geothermal Project Application for Certification, Volume 1, dated April 18, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Jacobs 2023bb – Jacobs (TN 252491-1). Morton Bay Geothermal Project Data Request Response Set 1, dated October 3, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Jacobs 2023kk – Jacobs (TN 253188). Morton Bay Geothermal Project Revised General Arrangement Refinement, dated November 17, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Jacobs 2023r – Jacobs (TN 250042). Morton Bay Geothermal Project Adequacy Report, dated May 8, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

NERC 2023 – North American Electric Reliability Council, Generating Unit Statistical Brochure 1 - 2022 - Units Reporting Events, dated August 29, 2023. Accessed online at: https://www.nerc.com/pa/RAPA/gads/Pages/Reports.aspx

4.3 Transmission System Engineering

Laiping Ng and Mark Hesters

4.3.1 Setting

The applicant has proposed to interconnect the 157 MW gross (140 MW net output) Morton Bay Geothermal Project (MBGP or project) to the new Imperial Irrigation District (IID) Switching Station with a proposed commercial operation by approximately the end of the second quarter of 2026. The MBGP would be a geothermal-powered power generating facility (PGF) including one steam turbine generator system, geothermal fluid processing systems, cooling tower and other required facilities and equipment. The MBGP would be within the unincorporated area of Imperial County, California.

Existing Conditions

The proposed project would be located within the unincorporated area of Imperial County, California. The IID 230 kV line is near the proposed project site. A new IID switching station would be built near the intersection of Garst Road and West Sinclair Road.

Regulatory

Federal/Regional

- The North American Electric Reliability Council's (NERC) Reliability Standards for the bulk electric transmission systems of North America provide national policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. NERC is the Electric Reliability Organization (ERO) for North America, subject to oversight by the Federal Energy Regulatory Commission (FERC). The NERC planning standards provide for system performance levels for both normal and contingency conditions. With regard to power flow and stability simulations, while these standards are similar to NERC and Western Electricity Coordinating Council (WECC) planning standards, certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards for transmission system contingency performance. The NERC's planning standards apply not only to interconnected system operation but to individual service areas as well (NERC 2024 and ongoing).
- NERC/WECC Planning Standards: The WECC Planning Standards are integrated with the NERC Reliability Standards to provide the system performance standards used to assess the reliability of the interconnected system. The first priority of the standards is the uninterrupted continuity of service and the second priority is the preservation of interconnected operation. Analysis of the WECC system is based to a large degree upon Section I.A of the standards, *NERC and WECC Planning Standards with Table I and WECC Disturbance-Performance Table* and on Section I.D, *NERC and WECC Standards for Voltage Support and Reactive Power.* These standards require that the

results of power flow and stability simulations verify defined performance levels including: allowable variations in thermal loading, voltage and frequency, and the loss of load that could occur on systems during various disturbances.

State

- California Public Utilities Commission (CPUC) General Order 95 (GO-95*), Rules for Overhead Electric Line Construction,* sets forth uniform requirements for the construction of overhead lines. Compliance with this order ensures both adequate service and the safety of both the public and the people who build, maintain, and operate overhead electric lines.
- CPUC General Order 128 (GO-128), *Rules for Construction of Underground Electric Supply and Communications Systems*, sets forth uniform requirements and minimum standards for underground supply systems to ensure adequate service and the safety of both the public and the people who build, maintain, and operate underground electric lines.

General

- National Electric Safety Code, 2023, provides electrical, mechanical, civil, and structural requirements for overhead electric line construction and operation.

Local

- Imperial Irrigation District (IID) Regulation No. 23 Clearance Requirements for Power Line Corridors

Cumulative

The transmission system engineering analysis focuses on whether or not a proposed project would meet required codes and standards. At all times, the transmission grid must remain in compliance with reliability standards, whether one project or many projects interconnect. Potential cumulative impacts on the transmission network are identified through the California ISO and utility generator interconnection process. In cases where a significant number of proposed generation projects could affect a particular portion of the transmission grid, the interconnecting utility or the California ISO can study the cluster of projects in order to identify the most efficient means to interconnect all of them.

4.3.2 Impacts

This analysis evaluates whether the proposed project's interconnection conforms to all LORS required for safe and reliable electric power transmission. Additionally, under CEQA, the Energy Commission (CEC) must conduct an environmental review of the "whole of the action," which may include facilities not licensed by the CEC (Title 14, California Code of Regulations §15378).

For the interconnection of either a proposed generating unit or transmission facility to the grid, the interconnecting utility (IID in this case) is responsible for ensuring the grid's

reliability. To ensure grid reliability, IID determines the transmission system impacts of the proposed project and any mitigation measures needed to ensure system conformance with utility reliability criteria, NERC planning standards, WECC reliability criteria, and the California ISO reliability criteria for potential impacts to their system. IID's BHE Cluster System Impact Study (SIS) and Updated SIS are used to determine the impacts of the proposed project on the transmission grid. CEC staff relies on these studies and any review conducted by the IID to determine the project's effect on the transmission grid and to identify whether downstream impacts or indirect project impacts would require additional equipment or strategies to bring the transmission network into compliance with applicable reliability standards.

The SIS and the Updated SIS analyze the grid both with and without the proposed project, under conditions specified in the planning standards and reliability criteria. The standards and criteria define the assumptions used in the study and establish the thresholds through which grid reliability is determined. The studies must analyze the impact of the project for the proposed first year of operation, and are thus based upon a forecast of loads, generation, and transmission. Generation and transmission forecasts are established by an interconnection queue. The studies are focused on thermal overloads, voltage deviations, system stability (excessive oscillations in generators and transmission system, voltage collapse, loss of loads, or cascading outages), and short circuit duties.

If the studies show that the interconnection of the project could cause the grid to be out of compliance with reliability standards, then the study will identify mitigation alternatives or ways in which the grid could be brought into compliance with reliability standards. If the mitigation identified by the California ISO or interconnecting utility includes transmission modifications or additions that require CEQA review, these additions could be considered part of the "whole of the action," in conjunction with the proposed power plant. The CEC must then analyze the environmental impacts of these modifications or additions.

The MBGP electrical power would be generated using a triple pressure condensing turbine/generator set including a 185 megavolt-amperes (MVA) generator step-up (13.8/230 kV) transformer, a maximum continuous rating of 140 MW (net) steam turbine rated at 174 MVA at a power factor of 0.85. The steam turbine generator is expected to generate 140 MW net output. The project would also include a 230 kV substation and power distribution center, a new 230 kV line, and a 3.2 mile-long overhead generator tie-line.

Switchyards and Interconnection Facilities

The proposed IID new switching station would be in a breaker and one-half configuration. The project generator-tie line would connect the Morton Bay Substation to the IID new switching station, Sinclair Switching Station, at the first point of interconnection into IID's network via a 3.2 mile-long overhead 477 kcmil aluminum conductor steel-reinforced (ACSR) conductor.

The new IID Sinclair Switching Station consists of nine 3,000-ampere 245 kV circuit breakers. The gen-tie line would be supported by single-pole steel structures ranging from 100 feet to 125 feet tall. Power would be delivered to the IID transmission system via the IID 230 kV IPP-119 A Gen Substation and the 230 kV Coachella Substation (Jacobs 2023DRR98).

4.3.2.1 Methodology and Thresholds of Significance

The SIS (Jacobs 2023DRR94) was performed in November 2022 by IID at the project owners' request. An Updated SIS (Jacobs 2024aa) was performed in January 2024 due to the adjustment and reroute of the new 230 kV transmission line from Coachella Valley Substation to Ramon Substation. The SISs identifies the transmission system impacts from the proposed three geothermal projects in IID's queue cluster and determined mitigation measures needed to ensure system conformance with utility reliability criteria, NERC planning standards, WECC reliability criteria, and the California ISO reliability criteria for potential impacts to their system. The interconnection of the generator might impact the utility system and cause it to be out of compliance with regulatory reliability requirements, the mitigation can vary from as little as adjusting the operation of the generator to new transmission lines.

What follows, excerpted from the SISs, constitutes the methodology used and identifies thresholds whereby the IID determines if the proposed project impacts the reliability of their network and if transmission upgrades are required. The study is designed to determine financial responsibility for transmission upgrades required for the mitigation of reliability impacts.

Three geothermal projects, including the proposed 140 MW MBGP with a gross output of 157 MW, the 77 MW Black Rock Geothermal Project with a gross output of 87 MW, and the proposed 140 MW Elmore North Geothermal Project with gross output of 157 MW would be added to the IID's transmission system. The SIS included a Power Flow study, Transient Stability study, Post-Transient (Reactive Margin) Stability study, and Short Circuit study. The SIS modeled projects in the IID queue cluster window, with the Geothermal Projects have a total net output of 357 MW.

The Power Flow study modeled:

1. 2026 heavy summer,
2. 2026 heavy summer without IPP-119A,
3. 2026-2027 light winter sensitivity,
4. 2026-2027 light winter without IPP-119A.

Detailed study assumptions are described in the SIS. The base cases included all generation in the IID queue and all planned IID transmission upgrade projects. The Power Flow study assessed the project's impact on the thermal loading of the transmission lines and equipment. The Transient Stability study and the Post-Transient Voltages Stability study were conducted to determine whether all three geothermal projects would create

any instability in the system following certain selected outages. The Short Circuit study was conducted with all the transmission upgrades projects and three geothermal projects. The Short Circuit study is to determine if the interconnection could overstress the existing substation facilities.

Thermal and voltage performance of the system was evaluated for base cases under normal (P0), single element outage (P1, P2), and selected multiple element outages (P3-P7). Thermal loadings were reported when a models transmission component was loaded above 95% of its continuous MVA rating, (P0), and above 95% of its emergency rating, (P1-P7). Generally, the concerns are raised when an element is found loaded above 100% of its normal or emergency rating; however, 95% was chosen to identify circuits that are also at the edge of an overload. Moreover, such circuits need to be closely monitored and can be placed as potential candidates for future upgrades.

Transmission voltage violations for normal (P0), conditions were reported when per unit voltages were less than 0.95 or greater than 1.05. Transmission voltage violations, following single or multiple outages, were reported when per unit voltages were less than 0.90 or greater than 1.1. Voltage deviations were recorded whenever these deviations were greater than 8% for P1 load buses and 10% for all other (Jacobs 2023DRR90, Jacobs 2024aa).

4.3.2.2 Direct and Indirect Impacts

Power Flow Study Results and Mitigations

The study analyzed the cluster of three geothermal projects with and without the IPP-119A generator, which is a powerplant in the IID queue cluster ahead of the proposed geothermal projects, and the transmission upgrades required for the reliable interconnection of the IPP-119A generator. The study did not provide an analysis specifically for the MBGP and only identified impacts associated with the cumulative interconnection and operation associated with three (or four with the IPP-119A) proposed geothermal projects. The impacts associated with the three geothermal cluster are significantly different than the impacts attributed to the three geothermal cluster when the IPP-119A and its associated transmission upgrades are assumed operational.

Cumulatively, the interconnection and operation of the three geothermal generators in the IID study cluster cause the IID system to violate reliability standards and mitigation measures are required to bring the system back into compliance with these standards. These mitigation measures include the expansion of existing substations and the construction of up to three new transmission lines.

Cost responsibility for the reliability impacts requiring two of the transmission line upgrades is currently assigned to generator IPP-119A, and these impacts and mitigation measures are not associated with the BHE Geothermal Cluster at this time. The remaining reliability impact and transmission line upgrade cost is associated with the BHE

Geothermal Cluster, but the study does not provide enough evidence to attribute the reliability impact and mitigation to any of the three projects in the cluster.

IID's network upgrades will support sustainable operation of IID's system and further power generation projects not affiliated with the MBGP. IID will construct and complete the network updates prior to project operations.

Steady State Impacts

The Steady State analysis excluding IPP-119A showed that the interconnection queue cluster including the proposed geothermal projects (projects) would overload the following lines and cause the IID to fall out of compliance with reliability standards:

Under Normal Conditions (N-0):

- Both the 230 kV KN & KS lines between Coachella Valley Substation – Future Flowing Wells Switching Station
- 230 kV KS lines between Coachella Valley Substation – Ramon Substation

Under Single Outage Conditions (N-1):

- Both the 230 kV KN & KS lines between Coachella Valley Substation – Future Flowing Wells Switching Station
- 230 kV KS lines between Coachella Valley Substation – Ramon Substation
- 92 kV line multiple sections in the Coachella Valley area related to Path 42

Under Multiple Outage Conditions (N-2):

- 92 kV R-line between Salton City Substation - Desert Shores Substation

Projects' impact to SCE System Under N-0 Condition:

- SCE Mirage – Devers #1 and #2 230 kV lines

Required Mitigations:

Too bring the IID system into compliance with reliability standards after the interconnection of the three geothermal projects the following transmission upgrades are required. The generators would bear the cost responsibility for these upgrades while IID would be the CEQA lead agency responsible for the environmental analysis.

- A new 15 miles long 230 kV line from IID Ramon Substation – SCE Devers Substation
- Expand Ramon Substation
- Install approximately 75 MVAR capacitors at the 230 kV Ramon Substation
- Install series compensation to compensate the new IID Switching Station – Coachella Valley Substation line by 50%.

Required Mitigations Contingent on generator IPP-119A:

The following network upgrades have been triggered by IPP-119A and is responsible for the cost of these upgrades. These are considered Contingent Network Upgrades and if the IPP-119A generator is not constructed, the BHE Cluster Projects would be responsible for paying for these upgrades. The contingent upgrades would be administered by IID.

- A new 70 mile long 230 kV line from a future IID Sinclair Switching Station – IID 230 Coachella Valley Substation
- A new 20 mile long 230 kV line from Coachella Valley Substation – Ramon Substation
- Expansion of Coachella Valley Substation

Required Mitigations Contingent on IPP-119A and IPP-142A:

- Create a new "K-Line N-2" Remedial Action Scheme (RAS) contingent on IPP-142A "R" line upgrade to drop Titan (Seville 3) and IPP-140 when specific N-2 conditions are met.

Transient Stability Results:

Both with and without the IPP-119A and under N-1 and N-2 conditions, the Transient Stability analysis indicated the geothermal projects would cause unstable conditions in the transmission system.

Required Mitigations:

The transmission upgrades of building a new 15-mile long 230 kV line from IID Ramon Substation – SCE Devers Substation would correct the instabilities.

Post-Transient Results:

The analysis indicates that the projects would cause transmission instabilities.

Required Mitigations:

The new 15-mile long 230 kV line from IID Ramon Substation – SCE Devers Substation would be required.

Short Circuit Study Results and Mitigations

Short Circuit studies were conducted to determine the degree to which the addition of all of the projects in IID's queue, including the three geothermal projects, and all necessary transmission upgrades increases fault duties at IID's substations, adjacent utility substations, and other 230 kV and 500 kV busses within the study area.

The study indicated with all the upgrades listed above, that the IID circuit breakers are sufficient to handle the new geothermal projects (Jacobs 2024aa).

4.3.2.3 Cumulative Impacts

The SIS and the Updated SIS modeled a total of 357 MW BHE power output to the IID transmission network. Both SISs identified the transmission cumulative impacts to IID system and to the SCE transmission system.

4.3.3 Applicable LORS and Project Conformance

Table 4.3-1 contains CEC staff's determination of conformance with applicable general, local, state and federal/regional LORS, including any proposed Conditions of Certification (COC) to ensure the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific COCs, the proposed project would be consistent with all applicable LORS. The subsection at the end of this section, "Staff Proposed Conditions of Certification," contains the full text of the referenced COC.

TABLE 4.3-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
Federal/Regional	
Federal Energy Regulatory Commission (FERC) /North American Electric Reliability Council (NERC)	**Yes.** The proposed interconnection facilities would comply with Federal/Regional regulations. COC **TSE-5** would require the submittal of any updates to the Large Generator Interconnection Agreement (LGIA) at least 30 days prior to the start of construction of transmission facilities.
NERC/WECC Planning Standards: The Western Electricity Coordinating Council (WECC) Planning Standards	**Yes.** The proposed interconnection facilities would comply with Federal/Regional regulations. COC **TSE-5** would require the submittal of any updates to the LGIA at least 30 days prior to the start of construction of transmission facilities.
State	
California Public Utilities Commission (CPUC) General Order 95 (GO-95)	**Yes.** The proposed overhead collector lines and generator tie-line would comply with CPUC GO-95. Compliance with COC **TSE-4** requires power plant switchyard, outlet line, and termination compliance with GO-95.
CPUC General Order 128 (GO-128)	**Yes.** The proposed underground collector lines would comply with CPUC GO-128. Compliance with COC **TSE-4** requires power plant switchyard, outlet line, and termination compliance with GO-128.
General	
National Electric Safety Code 2023 (NESC)	**Yes.** The proposed overhead collector lines, underground collector lines, and generator tie-line would comply with NESC. Compliance with COC **TSE-4** requires power plant switchyard, outlet line, and termination compliance with NESC.

TABLE 4.3-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
Local	
IID Regulation No. 23	**Yes.** The proposed overhead generator tie-line would comply with IID Regulation No. 23 Clearance Requirements for Power Line Corridors. Compliance with COCs **TSE-5** and **TSE-6** requires overhead conductor compliance with IID Regulation No. 23.

4.3.4 Conclusions and Recommendations

As discussed above, with implementation of COCs, the project would have a less than significant impact related to transmission system engineering and would conform with applicable LORS. CEC staff recommends adopting the COCs as detailed in subsection "4.3.5 Proposed Conditions of Certification" below.

4.3.5 Proposed Conditions of Certification

The following proposed COCs include measures to conformance with applicable LORS and that the project is reliably and safely interconnected to the IID transmission grid.

TSE-1 The project owner shall furnish to the Compliance Project Manager (CPM) and to the Delegate Chief Building Official (DCBO) a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by CEC staff, the project owner shall provide designated packages to the CPM when requested.

Verification: Prior to the start of construction, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the DCBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in **Table 1**: Major Equipment List below). Additions and deletions shall be made to the table only with CPM and DCBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Equipment List
Breakers
Step-up transformer
Switchyard
Busses
Surge arrestors
Disconnects
Take-off facilities
Electrical control building
Switchyard control building
Transmission pole/tower
Grounding system

TSE-2 Before the start of construction, the project owner shall assign to the project an electrical engineer and at least one of each of the following:

a. a civil engineer;

b. a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering;

c. a design engineer who is either a structural engineer or a civil engineer and fully competent and proficient in the design of power plant structures and equipment supports; or

d. a mechanical engineer (Business and Professions Code Sections 6704 et seq. require state registration to practice as either a civil engineer or a structural engineer in California).

The tasks performed by the civil, geotechnical, mechanical, electrical, or design engineers may be divided between two or more engineers as long as each engineer is responsible for a particular segment of the project, e.g., proposed earthwork, civil structures, power plant structures, or equipment support. No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical, or civil and design engineer, assigned as required by Facility Design COC **GEN-5**, may be responsible for design and review of the TSE facilities.

The project owner shall submit to the DCBO, for review and approval, the names, qualifications, and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications, and registration number of the newly assigned engineer to the DCBO for review and approval. The project owner shall notify the CPM of the DCBO's approval of the new engineer. This engineer shall be authorized to halt earth work and require changes; if site conditions are unsafe or do not conform with the predicted conditions used as the basis for design of earth work or foundations.

The electrical engineer shall:

1. be responsible for the electrical design of the power plant switchyard, outlet, and termination facilities; and
2. sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: Prior to the start of rough grading, the project owner shall submit to the DCBO for review and approval, the names, qualifications, and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the DCBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the DCBO for review and approval. The project owner shall notify the CPM of the DCBO's approval of the new engineer within five days of the approval.

TSE-3 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone DCBO design review and approval, the project owner shall document the discrepancy and recommend corrective action. The discrepancy documentation shall become a controlled document and shall be submitted to the DCBO for review and approval and refer to this condition of certification.

Verification: The project owner shall submit a copy of the DCBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the CPM, within five days, the reason for the disapproval, along with the revised corrective action required to obtain the DCBO's approval.

TSE-4 For the power plant switchyard, outlet line and termination, the project owner shall not begin any construction until plans for that increment of construction have been approved by the DCBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the DCBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the monthly compliance report:

a. receipt or delay of major electrical equipment;
b. testing or energization of major electrical equipment; and
c. the number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: Prior to the start of each increment of construction, the project owner shall submit to the DCBO for review and approval the final design plans, specifications

and calculations for equipment and systems of the power plant switchyard, and outlet line and termination, including a copy of the signed and stamped statement from the responsible electrical engineer verifying compliance with all applicable LORS, and send the CPM a copy of the transmittal letter in the next monthly compliance report.

TSE-5 The project owner shall ensure that the design, construction, and operation of the proposed transmission facilities will conform to all applicable LORS, and the requirements listed below. The project owner shall submit the required number of copies of the design drawings and calculations, as determined by the DCBO. Once approved, the project owner shall inform the CPM and DCBO of any anticipated changes to the design and shall submit a detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change to the CPM and DCBO for review and approval.

a. The power plant outlet line shall meet or exceed the electrical, mechanical, civil, and structural requirements of CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the High Voltage Electric Safety Orders, National Electric Code (NEC) and related industry standards.

b. Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.

c. Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner's standards.

d. The project conductors shall be sized to accommodate the full output of the project.

e. Termination facilities shall comply with applicable IID interconnection standards.

f. The project owner shall provide to the CPM:

   i. The Special Protection System sequencing and timing if applicable,

   ii. A letter stating that the mitigation measures or projects selected by the transmission owners for each reliability criteria violation, for which the project is responsible, are acceptable, if applicable,

   iii. Any updates to the executed LGIA signed by the IID and the project owner.

Verification: Prior to the start of construction or start of modification of transmission facilities, the project owner shall submit to the DCBO for approval:

a. Design drawings, specifications, and calculations conforming with CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the *High*

Voltage Electric Safety Orders, National Electric Code (NEC) and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems, and major switchyard equipment.

b. For each element of the transmission facilities identified above, the submittal package to the DCBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on "worst case conditions"[1] and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the *High Voltage Electric Safety Orders*, IID standards, National Electric Code (NEC), and related industry standards.

c. Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in charge, a route map, and an engineering description of the equipment and configurations covered by requirements COC **TSE-5** a) through f).

d. Generator Special Facilities Agreement shall be provided concurrently to the CPM and DCBO. Substitution of equipment and substation configurations shall be identified and justified by the project owner for DCBO and CPM approval.

e. Any changes or updates to the executed LGIA signed by the IID and the project owner.

f. Prior to the start of construction of any project modification requiring approval of the IID, provide the interconnection approval to the CPM. Interconnectional approval for modification of existing facilities can be in the form of an approved Material Modification or approval of the proposed changes to project and the existing interconnection facilities. Within 15 days after cessation of construction the project owner shall provide a statement to the CPM from the registered engineer in responsible charge (signed and sealed) that the switchyard and transmission facilities conform to the above listed requirements.

TSE-6 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and DCBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC, Title 8, CCR, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", applicable interconnection standards, NEC and related industry standards. In case of non-conformance, the project owner shall inform the CPM and DCBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken**.**

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and DCBO:

a. "As built" engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer

in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", and applicable interconnection standards, NEC, related industry standards.

b. An "as built" engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. "As built" drawings of the electrical, mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the "Compliance Monitoring Plan".

4.3.6 References

California Public Utilities Commission (CPUC) General Order 95 (GO-95), Rules for Overhead Electric Line Construction, revised January 15, 2020, ongoing.

California Public Utilities Commission (CPUC) General Order 128 (GO-128), Rules for Construction of Underground Electric Supply and Communications Systems,revised January 2006, ongoing.

Jacobs 2023a – Jacobs (TN 249723). Morton Bay Geothermal Project Application for Certification, Volume 1, dated April 18, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Jacobs 2023e – Jacobs (TN 249727). Morton Bay Geothermal Project AFC 2, Appendix 3, dated April 18, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Jacobs 2023bb – Jacobs (TN 252491-1 through TN 252491-8). Morton Bay Geothermal Project Data Request Response Set 1, dated October 3, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Jacobs 2023DRR94 – Jacobs (TN 252638 –DRR 94). DRR 94 IID BHE Cluster System Impact Study dated October 7, 2022. Confidential Report on File.

Jacobs 2023DRR98 – Jacobs (TN 252633 – DRR 98) DRR 98 IID Switching Station One-line Diagram. Confidential Report on File.

Jacobs 2024aa – Jacobs (TN 254996) MBGP Updated IID BHE Updated BHE Cluster System Impact Study, filed January 26, 2024. *Confidential Report on File*

NERC (North American Electric Reliability Council) 2024 Reliability Standards for the Bulk Electric Systems of North America, Updated January 1, 2024 and ongoing.

WECC (Western Electricity Coordinating Council) ongoing, WECC Regional Reliability Standards, ongoing.

4.3.7 Definition of Terms

ACSR — Aluminum conductor steel-reinforced

Ampacity — Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations

Ampere — The unit of current flowing in a conductor

Bus — Conductors that serve as a common connection for two or more circuits

Conductor — The part of the transmission line (the wire) that carries the current.

Congestion Management

A scheduling protocol that ensures dispatched generation and transmission loading (imports) will not violate criteria

Double Contingency

Also known as emergency or N-2 condition, occurs when a forced outage of two system elements occurs -- usually (but not exclusively) caused by one single event. Examples of an N-2 contingency include loss of two transmission circuits on single tower line or loss of two elements connected by a common circuit breaker due to the failure of that common breaker

Emergency Overload

See Single Contingency condition. This is also called an N-1.

Kcmil or KCM

Thousand circular mil. A unit of the conductor's cross sectional area; when divided by 1,273, the area in square inches is obtained.

Kilovolt (kV) — A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground

Loop — An electrical cul de sac. A transmission configuration that interrupts an existing circuit, diverts it to another connection, and returns it back to the interrupted circuit, thus forming a loop or cul de sac

Megavar — One megavolt ampere reactive

Megavars — Mega-volt-ampere-reactive. One million volt-ampere-reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system

Megavolt Ampere (MVA)

A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, divided by 1,000

Megawatt (MW)

A unit of power equivalent to 1,341 horsepower

N-0 Condition

See Normal Operation/Normal Overload, below

Normal Operation/ Normal Overload (N-0)

When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating

N-1 Condition

See Single Contingency, below

N-2 Condition

See Double Contingency, above

Outlet Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities with the main grid

Power Flow Analysis

A power flow analysis is a forward-looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers, and other equipment and system voltage levels

Reactive Power

Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system

Remedial Action Scheme

A remedial action scheme is an automatic control provision that, as one example, will trip a selected generating unit when a circuit overloads

Single Contingency

Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service

Special Protection Scheme/System

Detects a transmission outage (either a single or credible multiple contingency) or an overloaded transmission facility and then trips or runs back generation output to avoid potential overloaded facilities or other criteria violations

Switchyard A power plant switchyard is an integral part of a power plant that is used as an outlet for one or more electric generators

Thermal Rating

See ampacity.

TSE Transmission System Engineering

4.4 Worker Safety and Fire Protection

Matthew S Layton

4.4.1 Setting

Existing Conditions

The proposed Morton Bay Geothermal Project (MBGP) would be on unincorporated land in Imperial County next to the Salton Sea and within the Salton Sea Known Geothermal Resource Area. The surrounding area consists of actively farmed fields as well as other geothermal plants throughout. The project comprises the geothermal power plant as well as associated infrastructure, including up to 12 new well pads and associated production and injection wells. In addition, the project includes up to nine laydown and parking areas, two construction crew camps, and up to four borrow pits in the vicinity for use by MBGP, as well as Elmore North and Black Rock geothermal projects.

The project site would be served by the City of Calipatria's Fire Department (CFD) and the Imperial County Fire Department (ICFD). The CFD's lone station at 125 North Park Avenue, Calipatria, California, is approximately seven miles southeast of the project. The CFD is the primary responding agency. The response time to an emergency at the project site is approximately 15 to 20 minutes (CEC 2024d). The CFD and ICFD have an automatic mutual aid plan with surrounding fire stations. If additional assistance is needed, the Niland Fire District (at 8071 Luxor Avenue in Niland, California) and the California State Prison Fire Department (approximately seven miles east) would respond. The ICFD has a station at 1078 Dogwood Road, Heber, California, approximately 33 miles south of the project.

The CFD and ICFD are responsible for commanding all HAZMAT incidents at the project site. Imperial County has a HAZMAT Task Force that comprises firefighters with HAZMAT training from stations in cities and the county (CEC 2024c). The task force members have HAZMAT response training, and they are dispersed around Imperial County to balance the distribution of HAZMAT protection resources.

In addition to construction and operations worker safety issues, the potential exists for worker exposure to contaminated soil during site preparation. The Phase I Environmental Site Assessments conducted for this site in November 2022 concluded that no hazards or contaminants exist on-site that would warrant additional environmental remediation (Jacobs 2023i, Appendix 5-14). To address the possibility of soil contamination, a registered professional engineer or geologist would need to be available during soil excavation and grading to ensure proper handling and disposal of contaminated soil. If any contaminated soil were identified, then the proper personal protective equipment (PPE) would be provided as needed. See **Section 5.7 Hazards, Hazardous Materials/Waste, and Wildfire** for a more detailed analysis of this topic.

Regulatory

Federal

See State.

State

California Occupational Safety and Health Administration (Cal OSHA). California Occupational Safety and Health Administration (Cal OSHA) is the primary agency responsible for worker safety related to the handling and use of chemicals in the workplace. Cal OSHA standards are generally more stringent than federal regulations. Employers are required to monitor worker exposure to listed hazardous substances and notify workers of exposure (Title 8, Cal. Code Regs., §§ 337 340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings.

Local

The CFD and Imperial County use standards or guides such as National Fire Protection Association (NFPA) 850, the California Fire Code, and the Uniform Fire Code to implement local fire protection and emergency services.

California Fire Code. The California Fire Code contains regulations to safeguard life and property from hazards related to fire, explosion, and the storage, handling, and use of hazardous materials and devices.

National Fire Protection Association (NFPA). The National Fire Protection Association is a self-funded non-profit with a mission to help save lives and reduce loss with information, knowledge, and passion. The NFPS delivers expert knowledge through more than 300 codes and standards, research, professional training, public education, and outreach and advocacy.

Uniform Fire Code. The Uniform Fire Code contains a set of regulations to safeguard life and property from fires and explosion hazards. The Uniform Fire Code is adopted and amended by different states and jurisdictions to suit their local needs and conditions.

Cumulative

Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other impacts. The CEQA Guidelines require that the discussion reflect the severity of the impacts and the likelihood of their occurrence but need not provide as much detail as the discussion of the impacts attributable to the project alone. As presented in **Section 1 Executive Summary, Table 1-2**, staff has identified the following new and proposed geothermal projects listed

below with potential cumulative effects on emergency response times of the jurisdictions having authority:

- Elmore North Geothermal Project (Proposed)
- Black Rock Geothermal Project (Proposed)
- CTR Hell's Kitchen Lithium and Power Project (Under Construction)

4.4.2 Impacts

Worker safety and fire protection are regulated through laws, ordinances, regulations, and standards (LORS), at the federal, state, and local levels. Industrial workers at the facility operate equipment and handle hazardous materials and may face hazards that can result in accidents and serious injury. Protective measures are employed to eliminate or reduce these hazards or to minimize the risk through special training, protective equipment, and procedural controls.

The purpose of this Staff Assessment (SA) is to assess whether the worker safety and fire protection measures proposed by MBGP are adequate to:

- comply with applicable safety LORS;
- protect the workers during construction and operation of the facility, and during drilling of geothermal wells;
- protect against fire; and
- provide adequate emergency response procedures.

Worker Safety

Industrial environments are potentially dangerous during construction, commissioning, and operation of facilities. Workers at the proposed MBGP would be exposed to loud noises, moving equipment, trenches, confined space entry, and egress problems. The workers could experience falls, trips, burns, lacerations, being struck by objects, and numerous other potential injuries. They have the potential to be exposed to falling equipment or structures, chemical spills, hazardous waste, fires, explosions, electrical sparks and electrocution. Well-defined policies and procedures, training, and hazard recognition and control at the facility are important to minimize such hazards and protect workers. Compliance with applicable LORS would help ensure workers would be adequately protected from health and safety hazards.

A Construction Safety and Health Program would be prepared by the applicant to minimize worker hazards during construction and operation. The CEC staff uses the phrase "Safety and Health Program" to refer to the measures that would be taken to ensure compliance with the applicable LORS during the construction and operational phases of the project.

Construction Safety and Health Program

The proposed MBGP encompasses construction and operation of a geothermal power plant. Workers would be exposed to hazards typical of construction and operation of a geothermal power plant with the additional hazards posed by large amounts of geothermal brine handled on site and at wellheads.

Construction Safety Orders applicable to project construction are promulgated by California Occupational Safety and Health Administration (Cal OSHA) and are published at Title 8, California Code of Regulations sections 1502, et seq. The Construction Safety and Health Program would include the following:

- Construction Injury and Illness Prevention Program (Cal Code Regs., tit. 8, § 1509)
- Construction Fire Prevention Plan (Cal Code Regs., tit. 8, § 1920)
- Personal Protective Equipment Program (Cal Code Regs., tit. 8, §§ 1514 — 1522)
- Construction Emergency Action Program and Plan (Cal Code Regs., tit. 8, § 3220)

Additional programs under General Industry Safety Orders (Cal Code Regs., tit. 8, §§ 3200 to 6184), Electrical Safety Orders (Cal Code Regs., tit. 8, §§ 2299 to 2974) and Unfired Pressure Vessel Safety Orders (Cal Code Regs., tit. 8, §§ 450 to 544) would include:

- Electrical Safety Program
- Motor Vehicle and Heavy Equipment Safety Program
- Forklift Operation Program
- Excavation/Trenching Program
- Fall Protection Program
- Scaffolding/Ladder Safety Program
- Articulating Boom Platforms Program
- Crane and Material Handling Program
- Housekeeping and Material Handling and Storage Program
- Respiratory Protection Program
- Employee Exposure Monitoring Program
- Hand and Portable Power Tool Safety Program
- Hearing Conservation Program
- Back Injury Prevention Program
- Hazard Communication Program
- Heat and Cold Stress Monitoring and Control Program
- Pressure Vessel and Pipeline Safety Program

- Hazardous Waste Program
- Hot Work Safety Program
- Permit-Required Confined Space Entry Program
- Lockout/Tagout Energy Control Program
- Drilling and Construction of Wells Safety Program
- Heat Illness Prevention Program

The application for certification (AFC) adequately outlines the needed programs (Jacobs 2023a, Section 5.16.2.3.1). The applicant would provide detailed programs and plans to the CEC Compliance Project Manager (CPM), the CFD, and the Imperial County Fire Prevention Department (ICFPD) pursuant to Condition of Certification (COC) COC **WORKER SAFETY-1** prior to the start of construction of MBGP.

Operations and Maintenance Safety and Health Program

Prior to the start of operations at MBGP, the Operations and Maintenance Safety and Health Program would be prepared. This operational safety program would include the following programs and plans:

- Injury and Illness Prevention Program (Cal Code Regs., tit. 8, § 3203)
- Fire Prevention Program (Cal Code Regs., tit. 8, § 3221)
- Fire Protection System Impairment Program (2020 NFPA 850 Section 17.4.2 & Chapter 9 California Fire Code (CFC) Sections 901.7, 901.7.1-901.7.6)
- Personal Protective Equipment Program (Cal Code Regs., tit. 8, §§ 3401 to 3411)
- Emergency Action Plan (Cal Code Regs., tit. 8, § 3220)

In addition, the requirements under General Industry Safety Orders (Cal Code Regs., tit. 8, §§ 3200 to 6184), Electrical Safety Orders (Cal Code Regs., tit. 8, §§2299 to 2974), and Unfired Pressure Vessel Safety Orders (Cal Code Regs., tit. 8, §§ 450 to 544) would be applicable to the project. The written safety programs to be developed by the project owner for MBGP would ensure compliance with the above-mentioned requirements.

The AFC includes adequate outlines of the Injury and Illness Prevention Program, Emergency Action Plan, Fire Prevention Program, and Personal Protective Equipment Program (Jacobs 2023a, Section 5.16.2.3.2). Prior to operation of MBGP, all detailed programs and plans would be provided to the CPM, the CFD, and the ICFPD pursuant to COC **WORKER SAFETY-2**.

Safety and Health Program Elements

The applicant provided the proposed outlines for both a Construction Safety and Health Program and an Operations Safety and Health Program. The measures in these plans are derived from applicable sections of state and federal law. Both safety and health programs

would comprise seven more specific programs and would require major items detailed in the following paragraphs.

Injury and Illness Prevention Program. The Injury and Illness Prevention Program (IIPP) would include the following components as presented in the AFC (Jacobs 2023a, Section 5.16.2.3.2):

- Identifies the person(s) with authority and responsibility for implementing the program;
- provides a system for ensuring that employees utilize safe and healthy work practices;
- provides a system for facilitating employer-employee communications regarding safety;
- provides procedures for identifying and evaluating workplace hazards, including inspections to identify hazards and unsafe conditions;
- establishes methods for correcting unhealthy/unsafe conditions in a timely manner; and,
- provides an employee training program.

The CEC staff proposes that the applicant submit a final IIPP to the CPM for review and approval to satisfy proposed COC **WORKER SAFETY-1** and COC **WORKER SAFETY-2**.

Fire Prevention Plan. California Code of Regulations requires an Operations Fire Prevention Plan (Cal Code Regs., tit. 8, § 3221), designed to accomplish the following:

- determine general program requirements;
- determine fire hazard inventory, including ignition sources and mitigation;
- develop good housekeeping practices and proper materials storage;
- establish employee alarm and/or communication system(s);
- provide portable fire extinguishers at appropriate site locations;
- locate fixed fire-fighting equipment in suitable areas;
- specify fire control requirements and procedures;
- establish proper flammable and combustible liquid storage facilities;
- identify the location and use of flammable and combustible liquids;
- provide proper dispensing and determine disposal requirements for flammable liquids;
- establish and determine training and instruction requirements and programs; and,
- identify personnel to contact for information on plan contents.

The CEC staff proposes that the applicant submit a final Fire Prevention Plan to the CPM for review and approval and to the CFD for review and comment to satisfy proposed COC **WORKER SAFETY-1** and COC **WORKER SAFETY-2**.

Fire Protection System Impairment Program. NFPA 850 and the CFC lay out a prescriptive method that the project owner must follow when the facility's installed fire protection system is impaired. The plan would accomplish the following:

- supervise the safe shutdown of fire protection systems;
- provide notifications to the proper authorities and representatives;
- control potential fire hazards during the impairments through the use of fire watches and/or evacuation of the area effected;
- outline a repair strategy and timeline to get the fire protection system operational; and,
- restore the fire protection system to service as soon as possible.

The Fire Protection System Impairment Program would ensure that the project owner follows the prescriptive measures laid out in NFPA 850 and the CFC. Therefore, the CEC staff proposes that the applicant submit a final Fire Protection System Impairment Program to the CPM for review and approval, and to the CFD and the ICFPD for review and comment, to satisfy proposed COC **WORKER SAFETY-2**.

Drilling and Construction of Wells Safety Program. Because of the potential of hydrogen sulfide gas (H_2S) and geothermal steam exposure during the drilling and construction of geothermal wells, the project would develop and implement a plan to minimize risks from these hazards consistent with the state of California, Geologic Energy Management Division (CalGEM), Publication No. M10, Drilling and Operating Oil, Gas, and Geothermal Wells in an H2S Environment (CalGEM 1981). The project's non-condensable gas (NCG) stream is expected to contain benzene, which indicates a possibility that worker exposure to benzene could occur during well installation and development. Therefore, monitoring would be conducted to determine whether benzene exposure is within the Cal OSHA exposure limits. If monitoring results suggest possible exposures higher than the Cal OSHA limits, a program to minimize exposures would be implemented in conformance with the Cal OSHA benzene occupational exposure standard (Cal Code Regs, tit. 8, § 5218).

Low concentrations of H_2S are commonly present at geothermal power plants in NCG streams, condensate in the main condensers, and cooling towers. The H_2S contained in the NCG is abated in the cooling water and converted to sulfate by reacting with oxidizing biocides and dissolved oxygen in the water. H_2S present in the condensate from the main condenser is routed to the biooxidation box (OxBox) adjacent to the cooling tower where naturally occurring bacteria present in geothermal cooling water abates H2S present in the condensate. The OxBox includes a trickle block, splash fill, or equivalent packing that mixes cooling tower water with the condensate from the main condenser and drains into the cooling tower basin. The H_2S emissions compliance limit would be measured on the discharge of each cooling tower cell.

The CEC staff proposes that the applicant submit a final Drilling and Construction of Wells Safety Program to the CPM for review and approval to satisfy proposed COC **WORKER SAFETY-1** and COC **WORKER SAFETY-2**.

Personal Protective Equipment Program. California regulations require Personal Protective Equipment (PPE) and first aid supplies whenever hazards, such as H_2S, are present that, due to process, environment, chemicals or mechanical irritants, can cause injury or impair bodily function as a result of absorption, inhalation, or physical contact (Cal Code Regs., tit. 8, §§ 3380 to 3400). The MBGP operational environment would require PPE.

All safety equipment must meet National Institute of Safety and Health (NIOSH) or American National Standards Institute (ANSI) standards and would carry markings, numbers, or certificates of approval. Respirators must meet NIOSH and Cal OSHA standards. Each employee must be provided with the following information pertaining to the protective clothing and equipment:

- proper use, maintenance, and storage;
- when to use the protective clothing and equipment;
- benefits and limitations; and,
- when and how to replace the protective clothing and equipment.

The PPE Program ensures that employers comply with the applicable requirements for PPE and provides employees with the information and training necessary to protect them from potential workplace hazards.

The CEC staff proposes that the applicant submit a final PPE Program to the CPM for review and approval to satisfy proposed COC **WORKER SAFETY-1** and COC **WORKER SAFETY-2**.

Emergency Action Plan. California regulations require an Emergency Action Plan (Cal Code Regs., tit. 8, § 3220). The AFC contains a satisfactory outline for an emergency action plan (Jacobs 2023a, Section 5.16.2.3.2).

The outline lists the plans to accomplish the following:

- establish emergency escape procedures and emergency escape route for the facility;
- determine procedures to be followed by employees who remain to operate critical plant operations before they evacuate;
- provide procedures to account for all employees and visitors after emergency evacuation of the plant has been completed;
- specify rescue and medical duties for assigned employees;
- identify fire and emergency reporting procedures to regulatory agencies;
- develop alarm and communication system for the facility;

- establish a list of personnel to contact for information on the plan contents;
- provide emergency response procedures for ammonia release; and,
- determine and establish training and instruction requirements and programs.

The CEC staff proposes that the applicant submit a final Emergency Action Plan to the CPM for review and approval and to the CFD and ICFPD for review and comment to satisfy proposed COC **WORKER SAFETY-1** and COC **WORKER SAFETY-2**.

Safety & Health Program Monitoring. Protecting construction workers from hazards is among the greatest challenges in occupational safety and health. These hazards increase in complexity in the multi-employer worksites typical of large, complex, industrial-type projects such as the construction of geothermal power plants. The standard industry practice of hiring a Construction Safety Supervisor is used to ensure a safe and healthful environment for personnel. This standard practice has reduced and/or eliminated hazards evident in the audits staff recently conducted of power plants under construction. The federal Occupational Safety and Health Administration (OSHA) has also entered into strategic alliances with several professional and trade organizations to promote and recognize safety professionals trained as Construction Safety Supervisors, Construction Health and Safety Officers, and other professional designations. The goal of these partnerships is to encourage construction subcontractors in four areas:

- to improve their safety and health performance;
- to assist them in striving for the elimination of the four hazards (falls, electrical, caught in/between, and struck-by hazards), which account for the majority of fatalities and injuries in this industry and have been the focus of targeted OSHA inspections;
- to prevent serious accidents in the construction industry through implementation of enhanced safety and health programs and increased employee training; and,
- to recognize those subcontractors with exemplary safety and health programs.

To date, there are no OSHA or Cal OSHA requirements that an employer hire or provide for a construction safety officer. OSHA and Cal OSHA regulations do, however, require that safety be provided by an employer and the term *Competent Person* is used in many OSHA and Cal OSHA standards, documents, and directives. A Competent Person is usually defined by OSHA as an individual who, by way of training and/or experience, is knowledgeable of standards, is capable of identifying workplace hazards relating to the specific operations, is designated by the employer, and has authority to take appropriate action. Therefore, to meet the intent of the OSHA standard to provide for a safe workplace during power plant construction, staff proposes COC **WORKER SAFETY-3,** which would require the project owner to designate and provide a site Construction Safety Supervisor.

Accidents, fires, and two worker deaths have occurred at CEC-certified power plants in the past due to the failure to recognize and control safety hazards and the inability to adequately supervise compliance with occupational safety and health regulations. Safety problems have been documented by staff in safety audits conducted at several power

plants under construction. The findings include, but are not limited to, such safety oversights as:

- lack of posted confined space warning placards/signs;
- confusing and/or inadequate electrical and machinery lockout/tagout permitting and procedures;
- confusing and/or inappropriate procedures for handing over lockout/tagout and confined space permits from the construction team to commissioning team and then to operations;
- dangerous placement of hydraulic elevated platforms under each other;
- inappropriate placement of fire extinguishers near hot work;
- dangerous placement of numerous power cords in standing water on the site, thus increasing the risk of electrocution;
- inappropriate and unsecure placement of above-ground natural gas pipelines inside the facility, but too close to the perimeter fence; and,
- lack of adequate employee- or contractor-written training programs addressing proper procedures to follow in the event of finding suspicious packages or objects either on or off site.

To reduce and/or eliminate these hazards, it is necessary for the CEC to have a professional Safety Monitor available to do on-site verification checks of ongoing compliance with Cal OSHA regulations and periodically audit safety compliance during construction, commissioning, and the hand-over to operational status. These requirements are outlined in COC **WORKER SAFETY-4**. A Safety Monitor, hired by the project owner, yet reporting to the Delegate Chief Building Official (DCBO) and CPM, would serve as an "extra set of eyes" to ensure that safety procedures and practices are fully implemented at all power plants certified by the CEC.

Fire Hazards

During construction and operation of the MBGP, there is the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, hydraulic fluid, mineral oil, insulating fluid at the power plant switchyard, or flammable liquids, explosions, and over-heated equipment, may cause small fires. Major structural fires in areas without automatic fire detection and suppression systems are unlikely to occur at power plants. Fires and explosions of flammable gases or liquids are rare. Compliance with applicable LORS would be adequate to assure protection from all fire hazards.

The CEC staff reviewed the information provided in the AFC to determine if CFD and ICFD available fire protection services and equipment would be adequate to protect workers, and to determine the project's impact on fire protection services in the area. The project would rely on both on-site fire protection systems and local fire protection services. The on-site fire protection system provides the first line of defense for small fires. In the event of a major fire, fire support services, including trained firefighters and equipment for a

sustained response, would be provided by the CFD and ICFD (Jacobs 2023a, Sections 2.1.13 & 5.16.2.4, CEC 2024d).

Construction

During construction, portable fire extinguishers would be placed throughout the site at appropriate intervals and periodically maintained; safety procedures and training would be implemented according to the guidelines of the Construction Fire Protection and Prevention Program (Jacobs 2023a, Section 5.16.2.3.1), which would be reviewed for comment by the CFD and the ICFPD and approved by the CPM.

Operation

The information in the AFC indicates that the project intends to meet the fire protection and suppression requirements of the latest CFC, all applicable recommended NFPA standards (including Standard 850 addressing fire protection at electric generating plants), and all Cal OSHA requirements. However, staff would like to clarify the enforceability of fire protection best practices document NFPA 850: Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations.

The applicant stated in the AFC that MBGP would be built to the NFPA 850 standard and the CEC staff concurs with this assessment. For power plants permitted by the CEC, the DCBO is instructed through the CEC's DCBO manual to apply NFPA 850 during construction of the project. This measure has ensured that past projects have been built to the NFPA standard. However, staff believes that because NFPA 850 is written as a set of "recommended" practices rather than "required" ones, the potential for confusion exists about whether conformance to NFPA 850 is indeed required. Staff therefore proposes COC **WORKER SAFETY-7,** which would require the project's compliance with NFPA 850, giving NFPA 850 the effectiveness and clear enforceability of a building code in its application to the project. In any situations where both NFPA 850 and other state or local LORS have application, the more restrictive shall apply. This proposed COC would clarify for all stakeholders the responsibilities of the project owner as they relate to NFPA 850.

Fire suppression elements in the proposed plant would include both fixed and portable fire extinguishing systems. The fire water supply would be the on-site service water pond. Additional water capacity would be designed into the total pond capacity to supply fire needs. (Jacobs 2023a 2023, Section 2.3.3.6.8). The fire protection system would have fire detection sensors and monitoring equipment that would trigger alarms and automatically actuate the suppression systems.

In addition to the fixed fire protection system, appropriate class of service portable extinguishers and fire hydrants would be located throughout the facility at code-approved intervals (Jacobs 2023a, Section 2.3.3.6.8). These systems are standard requirements of NFPA and the CFC, and staff has determined that they would ensure adequate fire protection.

The project owner proposes having two separate entrances to the MBGP site. The CEC staff concurs with the project owner that this is a sound fire safety practice and allows for fire department vehicles and personnel to access the site should the main gate be blocked for any reason. Staff also asked the CFD about their policy for emergency access to the site and the CFD has stated that an alternative emergency entrance would be needed (CEC 2024d). Therefore, to ensure the adequate emergency access to the site by the fire department, staff proposes COC **WORKER SAFETY-6** that would require the project owner to identify, provide, and maintain for the lifetime of the project, additional secondary access to the site that meets the requirements for emergency response vehicles.

Emergency Medical Services Response

The CEC staff conducted a statewide survey to determine the frequency of emergency medical services (EMS) response and offsite fire-fighter response for power plants in California. The purpose of the analysis was to determine what impact, if any, power plants may have on local emergency services. Staff concludes that incidents at power plants that require fire or EMS response are infrequent and represent an insignificant impact on the local fire departments, except for rare instances where a rural fire department has a mostly volunteer fire-fighting staff. However, staff has determined that the potential for both work-related and non-work-related heart attacks exists at power plants. In fact, staff's research on the frequency of EMS response to power plants shows that many of the responses for cardiac emergencies involved non-work-related incidents, including those involving visitors. Staff finds that the quickest medical intervention for cardiac emergencies can only be achieved with the use of an on-site automatic external defibrillator (AED). Therefore, staff concludes that it is appropriate for the project owner to maintain an AED on site in order to treat cardiac emergencies resulting from industrial accidents or other non-work related causes.

Staff proposes COC **WORKER SAFETY-5,** which would require that this portable AED be located on site, that all power plant employees on site during operations be trained in its use, and that supervisory workers on site during construction and commissioning also be trained in its use.

Cumulative Impacts

The CEC staff reviewed the potential for the construction and operation of MBGP combined with existing industrial facilities and expected new facilities in the vicinity to result in impacts on the fire and emergency service capabilities of the CFD and ICFD and found that there was no significant potential for cumulative impacts to occur.

The CEC staff does not foresee changes to local recreational or agricultural land uses that could affect emergency services and response times. Based upon staff's experience with power plants around the state, staff concludes that while it is *possible* that during a major earthquake (or other major event) response to the power plant could impact the CFD and ICFD, the *likelihood* of that happening is less than significant. Therefore, this project

would not have a significant incremental or cumulative impact on the department's ability to respond to a fire or other emergency and no mitigation is required.

The CFD stated that its ability, and that of ICFD under the automatic mutual aid agreement, to respond to emergency calls would not be affected by the construction and operation of MBGP (Jacobs 2023a, CEC 2024d). Therefore, staff agrees with the applicant that mitigation is not required.

4.4.3 Applicable LORS and Project Conformance

Table 4.4-1 staff's determination of conformance with applicable local, state and federal LORS, including any proposed COCs, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific conditions of certification, the proposed project would be consistent with all applicable LORS. The subsection at the end of this section, "Proposed Conditions of Certification," contains the full text of the referenced COCs.

TABLE 4.4-1 COMPLIANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
Federal	
Title 29 U.S. Code (USC) section 651 et seq (Occupational Safety and Health Act of 1970)	See State
State	
CA Labor Code § 6401.7 (2022)	**Yes.** Staff's assessment below recognizes and lists many of the most important Cal OSHA worker safety and health programs, and **Worker Safety-1** & **2** impose specific conditions to ensure compliance with Title 8. **Worker Safety-3** & **4** requires the project owner to implement an additional layer of worker safety during construction.
Title 8, California Code of Regulations (Cal Code Regs.) all applicable sections (Cal OSHA regulations)	**Yes.** Staff's assessment below recognizes and lists many of the most important Cal OSHA worker safety and health programs, and **Worker Safety-1** & **2** impose specific conditions to ensure compliance with Title 8. **Worker Safety-3** & **4** requires the project owner to implement an additional layer of worker safety during construction.
Local	
Uniform Fire Code	**Yes.** See discussion on fire hazards.
California Fire Code	**Yes. Worker Safety-1** & **2** require review by Imperial County.
National Fire Protection Association (NFPA) 850	**Yes. Worker Safety-7** requires adherence to this NFPA industry standard.

4.4.4 Conclusions and Recommendations

The CEC staff concludes that if the project owner provides a Project Construction Safety and Health Program and a Project Operations and Maintenance Safety and Health Program as required by COC **WORKER SAFETY-1** and **-2** and fulfills the requirements of COC **WORKER SAFETY-3** through **-7**, the project would incorporate adequate levels of industrial safety and comply with applicable LORS. Staff also concludes that the operation of project would not present a significant impact on the local fire department.

4.4.5 Proposed Conditions of Certification

The following proposed COCs include measures to ensure conformance with applicable LORS.

COC WORKER SAFETY-1 The project owner shall submit to the CPM a copy of the Project Construction Health and Safety Program containing the following:

- a Construction Personal Protective Equipment Program;
- a Construction Exposure Monitoring Program;
- a Construction Injury and Illness Prevention Program;
- a Construction Drilling and Construction of Wells Safety Program;
- a Construction Emergency Action Plan;
- a Heat Illness Prevention Program; and
- a Construction Fire Prevention Plan.

The Personal Protective Equipment Program, the Exposure Monitoring Program, the Heat Illness Prevention Program, and the Injury and Illness Prevention Program shall be submitted to the CPM for review and approval concerning compliance of the program with all applicable safety orders. The Construction Emergency Action Plan, the Drilling and Construction of Wells Safety Program and the Fire Prevention Plan shall be submitted to the CFD and the ICFPD for review and comment prior to submittal to the CPM for approval.

Verification: At least 30 days prior to the start of construction, the project owner shall submit to the CPM for review and approval a copy of the Project Construction and Safety and Health Program. The project owner shall provide to the CPM a copy of letters from the CFD and Imperial County detailing resolved comments on the Construction Fire Prevention Plan, the Drilling and Construction of Wells Safety Program, and the Emergency Action Plan.

COC WORKER SAFETY-2 The project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety and Health Program containing the following items:

- an Operation Injury and Illness Prevention Plan;

- an Emergency Action Plan;
- a Hazardous Materials Management Program;
- a Fire Prevention Plan (Cal Code Regs., tit. 8, § 3221);
- a Fire Protection System Impairment Program;
- a Drilling and Construction of Wells Safety Program;
- a Heat Illness Prevention Program; and
- a Personal Protective Equipment Program (Cal Code Regs, tit.8, §§ 3401—3411).

The Operation Injury and Illness Prevention Plan, Hazardous Materials Management Program, Emergency Action Plan, Fire Prevention Plan, Fire Protection System Impairment Program, Drilling and Construction of Wells Safety Program, Heat Illness Prevention Program, and Personal Protective Equipment Program shall be submitted to the CPM for review and approval concerning compliance of the programs with all applicable safety orders. The Fire Prevention Plan, Fire Protection System Impairment Program, and the Emergency Action Plan shall also be submitted to the CFD and the ICFPD for review and comment.

Verification: At least 30 days prior to the start of first-fire or commissioning, the project owner shall submit to the CPM for approval a copy of the Project Operations and Maintenance Safety and Health Program. The project owner shall provide a copy to the CPM of letters from the CFD and Imperial County detailing the resolved comments on the Operations Fire Prevention Plan, Fire Protection System Impairment Program, and Emergency Action Plan.

COC WORKER SAFETY-3 The project owner shall provide a site Construction Safety Supervisor (CSS) who, by way of training and/or experience, is knowledgeable of power plant construction activities and relevant worker safety-related LORS. The CSS shall be capable of identifying workplace hazards relating to the construction activities; and has authority to take appropriate action to assure compliance and mitigate hazards. The CSS shall:

- have overall authority for coordination and implementation of all occupational safety and health practices, policies, and programs;
- ensure that the safety program for the project complies with Cal OSHA and federal regulations related to power plant projects;
- ensure that all construction and commissioning workers and supervisors receive adequate safety training;
- conduct accident and safety-related incident investigations and provide emergency response reports for injuries, and inform the CPM of safety-related incidents; and,

- ensure that all the plans identified in COC **WORKER SAFETY-1** and **-2** are implemented.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit to the CPM the name and contact information for the CSS. The contact information of any replacement CSS shall be submitted to the CPM within one business day.

The CSS shall submit in the Monthly Compliance Report (MCR) a monthly safety inspection report to include:

- a record of all employees trained for that month (all records shall be kept on site for the duration of the project);
- summary report of safety management actions and safety-related incidents that occurred during the month;
- report of any continuing or unresolved situations and incidents that may pose danger to life or health;
- report of any visits from Cal OSHA and/or any complaints from workers to Cal OSHA; and,
- report of accidents, injuries, and near misses that occurred during the month.

COC WORKER SAFETY-4 The project owner shall make payments to the DCBO for the services of a Safety Monitor based upon a reasonable fee schedule to be negotiated between the project owner and the DCBO. Those services shall be in addition to other work performed by the DCBO. The Safety Monitor shall be selected from an independent company not affiliated with the DCBO and report directly to the DCBO and will be responsible for verifying that the CSS, as required in COC **WORKER SAFETY-3**, implements all appropriate Cal OSHA and CEC safety requirements. The Safety Monitor shall conduct on-site (including linear facilities) safety inspections at intervals necessary to fulfill those responsibilities.

Verification: At least 60 days prior to the start of construction, the project owner shall provide proof of its agreement to fund the Safety Monitor services to the CPM for review and approval.

WORKER SAFETY-5 The project owner shall ensure that a portable AED is located on site during construction and operations and shall implement a program to ensure that workers are properly trained in its use and that the equipment is properly maintained and functional. During construction and commissioning the following persons shall be trained in its use and shall be on site whenever the workers that they supervise are on site: the Construction Project Manager or delegate, the CSS or delegate, and all shift foremen. During operations, all power plant employees on site shall be trained in its use. The training program shall be submitted to the CPM for review and approval.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit to the CPM proof that a portable AED is on site as soon as physically possible along with a copy of the training and maintenance program for review and approval.

COC WORKER SAFETY-6 The project owner shall prepare an Emergency Access Plan that shows a secondary emergency access to the MBGP site where the specifications of the roadway will comply with the latest edition of the California Fire Code. A secondary access must be maintained to the standards listed above for the life of the project.

Verification: At least 60 days prior to the start of construction, or within a time frame approved by the CPM, the project owner shall submit the Emergency Access Plan showing the secondary emergency access to the CFD for review and comment, and to the CPM for review and approval. If a change to the secondary access is proposed by the project owner, 180 days before it would occur, the project owner must submit the proposed change, with an updated Emergency Access Plan that shows the new proposed location/arrangement for the secondary emergency access roads, to the CFD and the ICFPD for review and comment, and to CPM for review and approval.

COC WORKER SAFETY-7 The project owner shall adhere to all applicable provisions of the latest version of NFPA 850: Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations, as the minimum level of fire protection. The project owner shall interpret and adhere to all applicable NFPA 850 recommended provisions and actions stating "should" as "shall." In any situations where both NFPA 850 and the state or local LORS have application, the more restrictive shall apply.

Verification: The project owner shall ensure that the project adheres to all applicable provisions of NFPA 850. At least 90 days prior to the start of construction of the fire protection system, the project owner shall provide all fire protection system specifications and drawings to the CFD and ICFPD for review and comment, to the CPM for review and approval, and to the DCBO for plan check approval and construction inspection.

4.4.6 References

CalGEM 1981 – CalGEM. M10 Drilling and Operating Oil, Gas, and Geothermal Wells in an H_2S Environment, California Department of Conservation, Geologic Energy Management Division - Oil, Gas, and Geothermal Instruction Manuals. Accessed online at: https://www.conservation.ca.gov/calgem/pubs_stats/Pages/instruction_manuals.aspx

CEC 2024c – California Energy Commission (TN 254655). ROC re: Hazardous Materials within Imperial County, dated February 23, 2024. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

CEC 2024d – California Energy Commission (TN 254658). ROC re: Emergency and Fire Services, Salton Sea Area of Imperial County, dated February 23, 2024. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Jacobs 2023a – Jacobs (TN 249723). Morton Bay Geothermal Project Application for Certification, Volume 1, dated April 18, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Jacobs 2023i – Jacobs (TN 249731). Morton Bay Geothermal Project AFC Volume 2, Appendix 5-14 Waste Management, dated April 18, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Section 5

Environmental Impact Assessment

5 Environmental Impact Assessment

Under the California Environmental Quality Act (CEQA), the environmental setting of a project is generally the physical environmental conditions in the vicinity of the project as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced (CEQA Guidelines, § 15125(a)(1)). The environmental setting described in an EIR by the lead agency will normally constitute the baseline physical conditions by which the lead agency determines whether an impact is significant (CEQA Guidelines, § 15125(a)).

5.1 Air Quality

Tao Jiang, Andres Perez, Wenjun Qian

5.1.1 Environmental Setting

Existing Conditions

The Morton Bay Geothermal Project (MBGP or project) would be in a region of the Imperial Valley, southeast of the Salton Sea, characterized mostly by agriculture and geothermal power production. The area surrounding the project site is primarily agricultural land. The Power Generation Facility (PGF) would be located on approximately 63 acres of a 160-acre parcel within Imperial County, California. The project site is located west of the existing Hudson Ranch Power Plant.

In addition to the power generating facility and linears, the project also consists of offsite components that fall outside the CEC's jurisdiction but are part of the overall geothermal project. These components include the geothermal well field under the jurisdiction of the county and CalGEM, the switching station under the jurisdiction of IID, the temporary laydown/parking area, borrow pits, and construction worker camp under the jurisdiction of the county. These offsite components are considered as part of this analysis.

Criteria Pollutants

The United States Environmental Protection Agency (U.S. EPA) and the California Air Resources Board (CARB) have established ambient air quality standards (AAQS) for several pollutants based on their adverse health effects. The U.S. EPA has set National Ambient Air Quality Standard (NAAQS) for ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter of 10 micrometers or less in diameter (PM10) and particulate matter of 2.5 micrometers and smaller in diameter (PM2.5), sulfur dioxide (SO_2), and lead (Pb). Primary standards were set to protect public health; secondary standards were set to protect public welfare against visibility impairment, damage to animals, crops, vegetation, and buildings. In addition, CARB has established California Ambient Air Quality Standard (CAAQS) for these pollutants, as well as for sulfate (SO_4), visibility reducing particles, hydrogen sulfide (H_2S), and vinyl chloride. CAAQS are generally stricter than NAAQS. The standards currently in effect in California and relevant to the project are shown in **Table 5.1-1**.

TABLE 5.1-1 NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards [a]	National Standards [b]	
			Primary	Secondary
O_3	1-hour	0.09 ppm (180 µg/m^3)	—	Same as Primary Standard
	8-hour	0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3)	
PM10	24-hour	50 µg/m^3	150 µg/m^3	Same as Primary Standard
	Annual Mean	20 µg/m^3	—	
PM2.5	24-hour	—	35 µg/m^3	Same as Primary Standard
	Annual Mean	12 µg/m^3	12.0 µg/m^3 [c]	15.0 µg/m^3
CO	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	—
	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	—
NO_2	1-hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3) [d]	—
	Annual Mean	0.030 ppm (57 µg/m^3)	53 ppb (100 µg/m^3)	Same as Primary Standard
SO_2 [e]	1-hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)	—
	3-hour	—	—	0.5 ppm (1,300 µg/m^3)
	24-hour	0.04 ppm (105 µg/m^3)	0.14 ppm (for certain areas) [e]	—
	Annual Mean	—	0.030 ppm (for certain areas) [e]	—
H_2S	1-hour	0.03 ppm (42 µg/m^3)	—	—

Notes: ppm=parts per million; ppb = parts per billion; µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter; "—" = no standard

[a] California standards for O_3, CO (except 8-hour Lake Tahoe), SO_2 (1 and 24 hour), NO_2, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded.

[b] National standards (other than O_3, PM, NO_2 [see note d below], and those based on annual arithmetic mean) are not to be exceeded more than once a year. The 8-hour O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. The 24-hour PM10 standard of 150 µg/m^3 is not to be exceeded more than once per year on average over a 3-year period. The 24-hour PM2.5 standard is attained when the 3-year average of 98th percentile concentration is less than or equal to 35 µg/m^3.

[c] On March 6, 2024, the U.S. EPA published a final rule to strengthen the annual PM2.5 NAAQS from 12.0 µg/m^3 to 9.0 µg/m^3 (U.S. EPA 2024c). See detailed discussion in the text.

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

[e] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The previous SO_2 standards (24-hour and annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP

call is a U.S. EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.
Sources: CARB 2024b, U.S. EPA 2024a, U.S. EPA 2024c

On March 6, 2024, the U.S. EPA published a final rule to strengthen the primary annual PM2.5 NAAQS from 12.0 µg/m^3 to 9.0 µg/m^3 (U.S. EPA 2024c). The final revisions to the primary annual PM2.5 NAAQS trigger a process under which States (and Tribes, if they choose) make recommendations to the Administrator regarding designations, identifying areas of the country that either meet or do not meet the new or revised PM NAAQS. Those areas that do not meet the revised PM NAAQS will need to develop plans that demonstrate how they will meet the standards. Until the U.S. EPA designates an area with respect to the proposed revised PM2.5 NAAQS, the New Source Review (NSR) provisions applicable under an area's designation for the 1997, 2006, and 2012 PM2.5 NAAQS would continue to apply (U.S. EPA 2024c). The State of California is currently working on recommendations which will be submitted no later than February 7, 2025. The initial designations followed with final designations are expected to be around the Spring of 2026. In addition, according to the U.S. EPA implementation guide for the revised annual PM2.5 NAAQS[1], at the effective date (60 days after publication in the Federal Register [i.e. May 6, 2024]) of the final rule, all applicants for permits to construct a new major source or major modification of an existing stationary source will need to conduct an air quality analysis that considers the revised PM2.5 NAAQS. Because this project's permit application was deemed complete on June 22, 2023, which is well before the effective date of the final rule, and because the project is neither a major source nor a Prevention of Significant Deterioration (PSD) source of PM2.5 emissions, an air quality analysis considering the revised PM2.5 NAAQS is not required. Considering the above factors, the project is evaluated against the 2012 annual PM2.5 NAAQS of 12.0 µg/m^3 according to the NSR program that was in place at the time the application was deemed complete, which was well before the new NAAQS was promulgated.

Use of the existing 12.0 µg/m^3 PM2.5 limit is also consistent with the Imperial County Air Pollution Control District's (ICAPCD) Rule 207 A.2.b. Rule 207 states, "Applications received by the District shall be subject to the requirements of this Rule in effect at the time such application is deemed complete, except when a more stringent new federal requirement not yet incorporated into this Rule shall apply to the new or modified Stationary Source." In this case, the new federal standard was not a requirement at the time the application was complete.

The air quality standards, shown in **Table 5.1-1**, are designed and established to be health protective. Air pollution can cause known health problems, especially for children, the elderly, and people with heart or lung problems. Healthy adults may experience symptoms during periods of intense exercise. Pollutants can also cause damage to vegetation, animals, and property. This analysis relies on the ambient air quality standards as health-based thresholds to help define what is considered a substantial

1 Available online at: https://www.epa.gov/system/files/documents/2024-02/pm-naaqs-implementation-fact-sheet.pdf.

pollutant concentration for the criteria air pollutants. However, as discussed in more detail under criteria "c" and "d" of the CEQA environmental checklist below, H_2S is regulated as a nuisance based on its odor detection level. Therefore, any temporary H_2S exceedances would be characterized as a nuisance rather than an issue of public health.

Attainment Status

Areas that meet the AAQS, based upon air monitoring measurements made by either the local air district or CARB, are classified as "attainment areas," and areas that have monitoring data that exceed AAQS are classified as "nonattainment areas" (Health and Saf. Code, §39608). If there is not enough data available to determine whether the standard is exceeded in an area, the area is designated as "unclassified."

The project site would be in the Imperial Valley, southeast of the Salton Sea, under the jurisdiction of ICAPCD. **Table 5.1-2** summarizes attainment status for the relevant criteria pollutants for the project area in the ICAPCD with both NAAQS and CAAQS.

TABLE 5.1-2 ATTAINMENT STATUS FOR PROJECT AREA IN ICAPCD

Pollutant	Averaging Time	State Designation	Federal Designation
O_3	1-hour	Nonattainment	—
	8-hour	Nonattainment	Nonattainment
PM10	24-hour	Nonattainment	Attainment (Maintenance) [a]
	Annual	Nonattainment	—
PM2.5	24-hour	—	Unclassified/Attainment [b]
	Annual	Attainment	Unclassified/Attainment [b, c]
CO	1-hour	Attainment	Unclassified/Attainment
	8-hour	Attainment	Unclassified/Attainment
NO_2	1-hour	Attainment	Unclassified/Attainment
	Annual	Attainment	Unclassified/Attainment
SO_2	1-hour	Attainment	Unclassified/Attainment
	24-hour	Attainment	— [d]
	Annual	—	— [d]
H_2S	1-hour	Unclassified	—

Notes:
[a] In September 2020, the U.S. EPA redesignated the Imperial Valley Planning Area from nonattainment to attainment for the PM10 NAAQS (U.S. EPA 2020).
[b] A portion of the Imperial County is designated as a nonattainment area for the PM2.5 NAAQS. However, the project area is unclassified/attainment for PM2.5 NAAQS.
[c] The attainment status for annual PM2.5 NAAQS was based on the 2012 standard of 12.0 µg/m^3. See detailed discussion regarding redesignation process for the new annual PM2.5 NAAQS in the text above.
[d] See notes under **Table 5.1-1**.
Sources: CARB 2024c, ICAPCD 2024, U.S. EPA 2020, U.S. EPA 2024b, U.S. EPA 2024c

Existing Ambient Air Quality

Table 5.1-3 shows the air quality monitoring data near the project from 2018 to 2022, the most recent years for which data are available. Data in this table that are marked in

bold indicate that the most-stringent current standard was exceeded during that period. The data are from the closest and most representative ambient air monitoring stations:

- O_3 and PM10 from the Niland station (about 3.8 miles north-northeast of the project boundary),
- PM2.5 from the Brawley station (about 15.4 miles south-southeast of the project boundary) and the El Centro station (about 28.1 miles south of the project boundary),
- NO_2 from the El Centro station and the Calexico station (about 36.5 miles south-southeast of the project boundary), and
- CO and SO_2 from the Calexico station.

TABLE 5.1-3 AMBIENT AIR QUALITY MONITORING DATA

Pollutant	Averaging Time	2018	2019	2020	2021	2022
O_3 (ppm)	1-hour	0.06	0.06	0.054	0.065	0.07
	8-hour	0.055	0.055	0.046	0.055	0.062
PM10 (µg/m^3)	24-hour	**333.8**	**156.3**	**241.3**	**218.2**	**474.7**
	Annual	**47.5**	**32.7**	**35.9**	**39.8**	**48.6**
PM2.5 (µg/m^3)	24-hour (98th percentile)	29.6	20.7	21	21	31.5
	Annual	10.4	8.3	9.4	8.3	8.7
NO_2 (ppb)	1-hour (maximum)	34.1	36.7	44.8	55.8	51.3
	1-hour (98th percentile)	32.1	29.5	35.5	37.9	39.2
	Annual	12.49	9.26	7.93	6.73	6.96
CO (ppm)	1-hour	5.6	4.4	4.7	4.2	5
	8-hour	3.7	3.7	3.3	3.4	3.6
SO_2 (ppb)	1-hour (maximum)	7.2	7.5	7.1	8.6	8.6
	1-hour (99th percentile)	5	5	7	6	6
	24-hour	2.4	1.6	1.9	2.7	2.1
	Annual	0.61	0.31	0.4	0.42	0.36

Note: Concentrations in **bold** type are those that exceed the limiting ambient air quality standard.
Sources: CARB 2023, U.S. EPA 2023

The maximum concentration values listed in **Table 5.1-3** have not been screened to remove values that are designated as exceptional events. Violations that are the result of exceptional events, such as high winds, are normally excluded from consideration as AAQS violations (U.S. EPA 2007). High winds undoubtedly affected many of the maximum PM10 concentration values in ICAPCD. When U.S. EPA redesignated ICAPCD as attainment for PM10 NAAQS in September 2020, the exceptional events were excluded from the ambient PM10 monitoring data (U.S. EPA 2020). For a conservative analysis, staff uses the background ambient air quality concentrations from 2020 to 2022 to represent the baseline condition at the project site.

Health Effects of Criteria Pollutants

Below are descriptions of the health effects of criteria pollutants that are a concern in the regional study area. Health and Safety Code, section 39606 requires CARB to adopt ambient air quality standards at levels that adequately protect the health of the public, including infants and children, with an adequate margin of safety. Ambient air quality standards define clean air (CARB 2024d).

Ozone. Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and NOx, including NO_2. ROG and NOx are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight.

Ozone can cause the muscles in the airways to constrict, trapping air in the alveoli, potentially leading to wheezing and shortness of breath. Ozone can make it more difficult to breathe deeply and vigorously; cause shortness of breath and pain when taking a deep breath; cause coughing and sore or scratchy throat; inflame and damage the airways; aggravate lung diseases, such as asthma, emphysema, and chronic bronchitis; increase the frequency of asthma attacks; make the lungs more susceptible to infection; continue to damage the lungs even when the symptoms have disappeared; and cause chronic obstructive pulmonary disease. Long-term exposure to ozone is linked to the aggravation of asthma and is likely to be one of many causes of asthma development. Long-term exposures to higher concentrations of ozone may also be linked to permanent lung damage, such as abnormal lung development in children. The inhalation of ozone causes inflammation and irritation of the tissues lining human airways, causing, and worsening, a variety of symptoms and exposure to ozone can reduce the volume of air that the lungs breathe in and cause shortness of breath.

People most at risk for adverse health effects from breathing air containing ozone include people with asthma, children, older adults, and people who are active outdoors, especially outdoor workers. Children are at greatest risk from exposure to ozone because their lungs are still developing and they are more likely to be active outdoors when ozone levels are high, which increases their exposure. Studies show that children are no more or less likely to suffer harmful effects than adults; however, children and teens may be more susceptible to ozone and other pollutants because they spend nearly twice as much time outdoors and engage in vigorous activities compared to adults. Children breathe more rapidly than adults and inhale more pollution per pound of their body weight than adults and are less likely than adults to notice their own symptoms and avoid harmful exposures.

Particulate Matter. PM10 and PM2.5 represent size fractions of particulate matter that can be inhaled into air passages and the lungs and can cause adverse health effects. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly or can contain absorbed gases (e.g., chlorides or ammonium) that may be

injurious to health. The health effects of particulate matter may include cardiovascular effects, such as cardiac arrhythmias and heart attacks, and respiratory effects, such as asthma attacks and bronchitis. Particulates can also reduce visibility.

Nitrogen Dioxide. Breathing air with a high concentration of NO_2 can irritate airways in the human respiratory system. Such exposures over short periods (as represented by the 1-hour standards) can aggravate respiratory diseases, particularly asthma, leading to respiratory symptoms (such as coughing, wheezing or difficulty breathing), hospital admissions, and visits to emergency rooms. Longer exposures to elevated concentrations of NO_2 (as represented by the annual standards) may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. People with asthma, as well as children and the elderly, are generally at greater risk for the health effects of NO_2. NOx (includes NO_2 and NO) reacts with other chemicals in the air and sunlight to form both particulate matter and ozone.

Carbon Monoxide. CO is a pollutant that is a product of incomplete combustion and is mostly associated with motor vehicle traffic. High CO concentrations develop primarily during winter when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in the reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia.

Sulfur Dioxide. SO_2 is produced through the combustion of sulfur or sulfur-containing fuels, such as coal. SO_2 is also a precursor to the formation of atmospheric sulfate and particulate matter (PM10 and PM2.5) and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain.

Lead. Lead has a range of adverse neurotoxin health effects and previously was predominately released into the atmosphere primarily via the combustion of leaded gasoline. The phase-out of leaded gasoline has resulted in decreasing levels of atmospheric lead.

Hydrogen Sulfide. Exposure to low concentrations of H_2S may cause irritation to the eyes, nose, or throat. It may also cause difficulty in breathing for some asthmatics. Respiratory distress or arrest has been observed in people exposed to very high concentrations of H_2S. Exposure to low concentrations of H_2S may cause headaches, poor memory, tiredness, and balance problems. Brief exposures to high concentrations of H_2S can cause loss of consciousness. In most cases, the person appears to regain consciousness without any other effects. However, in some individuals, there may be permanent or long-term effects such as headaches, poor attention span, poor memory, and poor motor function.

Sensitive Receptors

Sensitive receptors, such as infants, the aged, and people with specific illnesses or diseases, are the subpopulations which are more sensitive to the effects of toxic substance exposure.

Schools, both public and private, day care facilities, convalescent homes, and hospitals are of particular concern. Although residences and worker receptors are not technically defined as "sensitive receptors" by California Office of Environmental Health Hazard Assessment (OEHHA), they were conservatively analyzed as sensitive receptors in applicant's analysis due to the lack of sensitive receptors near the facility (Jacobs 2023ii, p. 5.9-2, Jacobs 2023rr, Table 6). Appendix 5.9A of the application (Jacobs 2023rr, Table 1) delineates data on the population by census tract within a six-mile radius of the project site, as well as a comprehensive list of sensitive receptors analyzed in the health risk assessment. **Section 5.10 Public Health** includes a more detailed description of the sensitive receptors near the project.

Regulatory

Federal, state, and regional agencies share responsibility for managing and regulating air quality in the Salton Sea Air Basin.

Federal

Federal Clean Air Act

The federal Clean Air Act (CAA) (42 U.S.C., § 7401 et seq.) establishes the statutory framework for regulation of air quality in the United States. Under the CAA, the U.S. EPA oversees the implementation of federal programs for permitting new and modified stationary sources, controlling toxic air contaminants (TACs), and reducing emissions from motor vehicles and other mobile sources.

Title I (Air Pollution Prevention and Control) of CAA requires the establishment of NAAQS, air quality designations, and plan requirements for nonattainment areas. States are required to submit a SIP to the U.S. EPA for areas in nonattainment with NAAQS. The SIP must demonstrate how state and local regulatory agencies will institute rules, regulations, and other programs to attain NAAQS. Once approved by the U.S. EPA and published in the Federal Register, the local air district rules contained in the SIP are federally enforceable.

The Prevention of Significant Deterioration (PSD) program is a federal program for federal attainment areas. The purpose of the federal PSD program is to ensure that attainment areas remain in attainment of NAAQS based upon a proposed facility's annual PTE. If the annual emissions of a proposed project are less than prescribed amounts, a PSD review is not required. The project is not expected to be subject to PSD.

Title 40 Code of Federal Regulations Subchapter C – Air Programs

Title 40 of the Code of Federal Regulations (CFR) Part 51, Requirements for Preparation, Adoption, and Submittal of Implementation Plans, establishes the requirements for Nonattainment New Source Review (NSR). The NSR program requires new and modified stationary sources to obtain air permits and requires Best Available Control Technology (BACT) and emissions offsets. Permitting and enforcement for NSR is delegated to ICAPCD.

40 CFR Part 52, Approval and Promulgation of Implementation Plans, including 40 CFR Part 52.21, Prevention of Significant Deterioration (PSD) of air quality, requires major sources or major modifications to major sources to obtain permits for attainment pollutants. The purpose of the federal PSD program is to ensure that attainment areas remain in attainment of NAAQS based upon a proposed facility's annual emissions. The proposed project would be a new source that does not have a rule listed emission source thus the PSD trigger levels are 250 tons per year for NOx, VOC, SO_2, PM2.5 and CO. Because proposed project emissions would be less than prescribed amounts, the project would not be subject to PSD.

Title 40 Code of Federal Regulations Part 60 Standards of Performance for New Stationary Sources

New Source Performance Standard (NSPS) Subpart IIII—Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. Clean Air Act section 111 (42 U.S.C., § 7411) authorizes the U.S. EPA to develop technology-based standards for specific categories of sources. Manufacturers of emergency stationary internal combustion engines (ICE) using diesel fuel must certify that new engines comply with these emission standards (40 C.F.R., § 60.4205). Under NSPS Subpart IIII, owners and operators of emergency engines must limit operation to a maximum of 100 hours per year for maintenance and testing, which allows for some use, if necessary, to protect grid reliability; there is no time limit on the use of an emergency stationary ICE in emergency situations (40 C.F.R., § 60.4211(f)). The project's Tier 4 diesel-fired emergency gensets would be subject to and must comply with the requirements in NSPS Subpart IIII.

National Emission Standards for Hazardous Air Pollutants (NESHAP) Subpart ZZZZ—National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. The CAA, section 112 (42 U.S.C., § 7412) addresses emissions of HAPs. The CAA defines HAPs as a variety of substances that pose serious health risks. Direct exposure to HAPs has been shown to cause cancer, reproductive effects or birth defects, damage to the brain and nervous system, and respiratory disorders. Categories of sources that cause HAP emissions are controlled through separate standards under CAA Section 112: National Emission Standards for Hazardous Air Pollutants (NESHAP). These standards are specifically designed to reduce the potency, persistence, or potential bioaccumulation of HAPs. New sources that emit more than 10 tpy of any specified HAP or more than 25 tpy of any combination of HAPs are required to apply Maximum Achievable Control Technology.

NESHAP Subpart ZZZZ applies to the project's diesel-fired emergency gensets, however, because NSPS Subpart IIII also applies to the gensets, the units would comply with NESHAP Subpart ZZZZ by complying with the requirements of NSPS Subpart IIII.

State

Generally, state law designates local air districts as having primary responsibility for the control of air pollution from all sources other than mobile sources, while the control of vehicular air sources is the responsibility of CARB. (Health and Saf. Code, §39002) CARB is also responsible for the state's overall air quality management, including, among other things, establishing CAAQS for criteria pollutants identifying TACs of statewide concern and adopting measures to reduce the emissions of those TACs through airborne toxic control measures (ATCM), and regulating emissions of GHGs.

Section 40910 of the California Health and Safety Code. California Health and Safety Code (HSC) Section 40910-40930 requires air district permitting of stationary sources to be consistent with CARB approved Clean Air Plans.

Section 41700 of the California State Health and Safety Code. This section states that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property."

California Code of Regulations. California Code of Regulations (CCR) Section 93115. Airborne Toxics Control Measure (ATCM) for Stationary Compression Ignition Engines. Limits the types of fuels allowed, established maximum emission rates, establishes recordkeeping requirements on stationary compression ignition engines, including diesel-powered emergency generator and fire water pump engines.

U.S. EPA/CARB Off-Road Mobile Sources Emission Reduction Program. The California Clean Air Act mandates that CARB achieve the maximum degree of emission reductions from all off-road mobile sources to attain the state ambient air quality standards. Off-road mobile sources include construction equipment. The earliest (Tier 1) standards for large compression-ignition engines used in off-road mobile sources became effective in California in 1996. Since then, the Tier 3 standards for large compression-ignition engines used in off-road mobile sources went into effect in California for most engine classes in 2006, and Tier 4 or Tier 4 Interim (4i) standards apply to all off-road diesel engines model year 2012 or newer. The tiered engine exhaust standards and standards for fleets that are already in-use provide comprehensive regulation and control to reduce NOx and toxic diesel particulate matter (DPM) emissions from equipment throughout the State.

CARB In-Use Off-Road Diesel Fueled Fleets Regulation. The regulations for in-use off-road diesel equipment are designed to reduce NOx and DPM. Depending on the size

of the fleet of equipment, the owner would need to ensure that the average emissions performance of the fleet meets certain state-wide standards (13 California Code of Regulations, Chapter 10, Section 2449.1). In lieu of improving the emissions performance of the fleet, electric systems can be installed to replace diesel equipment in the fleet average calculations. Presently, all equipment owners are subject to a five-minute idling restriction in the rule (13 California Code of Regulations, Chapter 10, Section 2449).

CARB Portable Equipment Registration Program (PERP). This program allows owners or operators of portable engines and associated equipment commonly used for construction or farming to register their units under a statewide portable program. This program allows them to operate their equipment throughout California without having to obtain individual permits from local air districts.

Local

Rule 109 – Source Sampling. This rule outlines facility design requirements for source sampling for any facility emitting pollutants which have emission limits. The project owner is expected to comply with this rule by providing sampling ports and platforms, along with proper access and sampling utilities, so that source samples can be taken to determine the compliance status of the facility's emissions units.

Rule 111 – Equipment Breakdown. This rule details the notification and corrective action requirements in an equipment breakdown situation. The project owner is expected to comply with this rule by completing the required procedures if a breakdown condition should occur. The Air Pollution Control Officer (APCO) shall be notified of a breakdown condition as soon as reasonably possible, but no later than two (2) hours after its detection. The reporting requirements under this rule must be completed within ten days after a breakdown occurrence has been corrected.

Rule 201 – Permits Required. Except as exempted within the Air District Rules and Regulations, new or modified sources which may emit or control air contaminants must obtain written authorization from the ICAPCD prior to construction, and any person who operates a piece of equipment that emits or control air contaminants is required to obtain a PTO. The MBGP will include emissions sources and abatement equipment that require both an ATC and a PTO from the Air District. However, because the proposed project is a power plant seeking certification by the CEC, the application will be processed according to the procedures outlined in Rule 207 Section D.4.

Rule 202 – Exemptions. This rule includes a list of equipment that are exempt from obtaining an ATC or PTO. Section E.8 exempts storage tanks from permitting requirements if they contain unheated organic materials with boiling points over 302 degrees Fahrenheit or vapor pressures less than 0.1 pounds per square inch absolute (psia). The project owner provided the District with information regarding the contents of storage tanks in supplemental materials dated June 12, 2023 and October 4, 2023. This information included the identities of the materials to be stored in the tanks at the MBGP, which include diesel, used oil, lube oil, and a naturally occurring radioactive

materials (NORMs) inhibitor containing a mixture of amine triphosphate, trisodium phosphate, and ethylene glycol. Based on the identities of the materials to be contained in the storage tanks, all tanks would meet exemptions from Rule 202 and thus exempt from permitting.

Rule 204 – Applications. The project owner has satisfied Air District Rule 204 with the submittal of a complete permit application to the Air District for the proposed construction of the MBGP. The application was deemed complete by the Air District on June 22, 2023. Additionally, as the Air District conducted its full review of the proposed project, the project owner provided further details regarding project equipment and emission sources.

Rule 206 – Processing of Applications. This rule references guidelines established by the APCO for the processing of applications and issuance of permits. The proposed project does not qualify for a ministerial permit and thus will be processed as a discretionary permit project. Section C of the rule specifies the public review and noticing requirements associated with discretionary permits. Specifically, Section C.3 lists emissions thresholds above which public notice is required. Based on the permit application, the MBGP will exceed the emissions threshold in Section C.3 of 100 pounds per day for H_2S and thus will trigger public notice requirements of this rule.

Rule 207: New and Modified Stationary Source Review. This rule establishes preconstruction review requirements for new and modified stationary sources to ensure that the operation of such sources does not interfere with the attainment or maintenance of ambient air quality standards (AAQS). The rule includes standards for the implementation of best available control technology (BACT) and emission offsets, as well as provisions for an air quality impact assessment, if requested by the APCO. Section D.4 specifies the administrative requirements associated with projects involving power plants 50 MW and greater. Because the MBGP involves the development of a power plant with a net generation capacity of 140 MW, it is subject to these provisions.

Cumulative

The proposed project would be in Imperial Valley, which is classified as a nonattainment area for the state 1-hour and 8-hour ozone standards, as well as state 24-hour and annual PM10 standards. The criteria air pollutants of greatest concern are ozone and PM10.

The Cumulative Project Scenario and a list of cumulative projects appears in **Section 1 Executive Summary, Table 1-2**. Past, present, and reasonably foreseeable probable future air pollutant emissions could be attributable to each of the cumulative projects, especially those that involve construction activities or operations and maintenance (O&M) activities with substantial sources of air pollutants. Each of the projects in the cumulative project scenario could result in some level of contribution to the region's adverse air quality conditions, although the individual contribution of each project would be minimized if the project is consistent with air quality management planning efforts and in compliance with applicable local air district rules and regulations, as described with the regulatory setting above.

5.1.2 Environmental Impacts

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:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☒	☐	☐
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☒	☐	☐
c. Expose sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, air quality.

5.1.2.1 Methodology and Thresholds of Significance

In addition to the above environmental checklist, staff used the following methodology and thresholds of significance to evaluate the project.

Methodology

This air quality evaluation assesses the degree to which the project would potentially cause a significant impact according to the California Environmental Quality Act (CEQA) guidelines and federal, state, and local air district rules and regulations. ICAPCD is the local air district responsible for the attainment and maintenance of the federal and state AAQS and associated program requirements at the project location. The analysis is based upon the methodologies and related thresholds of significance in the ICAPCD CEQA Air Quality Handbook (ICAPCD 2017) to determine the significance of the potential air quality emissions and impacts.

The emissions estimation methodology for the project was developed in coordination with the latest available data and engineering design. Construction emissions were estimated based on emission factors from California Emissions Estimator Model (CalEEMod) and EMFAC2021. The operational emissions were estimated based on analytical data from other geothermal power plants in the area and vendor-provided data. O&M equipment and vehicle emissions were estimated based on emission factors from CalEEMod and EMFAC2021.

CEC staff's analysis determines whether the project's ground-level impacts would be likely to exceed any AAQS or contribute substantially to an existing or projected air quality violation, and, if necessary, proposes mitigation to reduce or eliminate these pollutant exceedances or substantial contributions. The American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD [Version 22112]) was used for this ambient air quality impact analysis, as recommended in the U.S. EPA's Guideline on Air Quality Models (U.S. EPA 2017).

Thresholds of Significance

Table 5.1-4 presents the ICAPCD's regional air quality significance thresholds currently being implemented for construction and operation, as derived from the ICAPCD's CEQA Air Quality Handbook (ICAPCD 2017). If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the district's existing air quality conditions. Staff evaluates project emissions against the ICAPCD significance thresholds under environmental checklist criterion "b."

TABLE 5.1-4 ICAPCD THRESHOLDS OF SIGNIFICANCE

Pollutant	Construction	Operation
	Average Daily Emissions (lbs/day)	Average Daily Emissions (lbs/day)
NOx	100	137
CO	550	550
VOC	75	137
SOx	—	150
PM10	150	150
PM2.5	—	550

Source: ICAPCD 2017

Staff also evaluates the project's potential to expose sensitive receptors to substantial pollutant concentrations under environmental checklist criterion "c." The analysis includes ambient air quality impact modeling for construction and operation to estimate the air quality impacts caused by the emissions. Staff uses AAQS, shown in **Table 5.1-1**, to help define what is considered a substantial pollutant concentration for criteria pollutants. Staff's analysis determines whether the project would be likely to exceed any AAQS or contribute substantially to an existing or projected air quality violation, and, if necessary, proposes mitigation to reduce or eliminate these pollutant exceedances or substantial contributions.

Significance criteria also include U.S. EPA Significant Impact Levels (SILs), as shown in **Table 5.1-5**. Regulatory agencies have traditionally applied SILs as a threshold value. Levels of off-site concentration predicted to result from a source's emissions below the SIL are not significant and do not warrant additional analysis or mitigation. Specifically, U.S. EPA has stated in its guidance, when a PSD permit applicant has shown through air quality modeling that the projected air quality impact from a proposed source for a particular pollutant is not significant or meaningful, there is a valid basis in most cases

for the permitting authority to conclude that the proposed source will not cause or contribute to a violation of a NAAQS or PSD increment for that pollutant. To show that the proposed source will not have a significant or meaningful impact on air quality, permit applicants and permitting authorities may elect to use these SIL values (U.S. EPA 2018).

However, if the ambient concentration estimates from the refined modeling analysis indicate that the source's emissions have the potential to cause or contribute to a violation, then a cumulative impact analysis should be undertaken (U.S. EPA 2017).

TABLE 5.1-5 SIGNIFICANT IMPACT LEVELS (µg/m³)

Pollutant	Averaging Time	Class II[2] Significant Impact Levels
Ozone	8-hour	1.96 (1.0 ppb) [a]
PM10	24-hour	5.0 [b]
	Annual	1.0 [b]
PM2.5	24-hour	1.2 [b]
	Annual	0.2 [a]
CO	1-hour	2,000 [b]
	8-hour	500 [b]
NO_2	1-hour	7.5 (4 ppb) [c]
	Annual	1.0 [b]
SO_2	1-hour	7.86 (3 ppb) [d]
	24-hour	5 [b]
	Annual	1.0 [b]

Notes: SIL values are based on the form of the applicable NAAQS
[a] Ozone and annual PM2.5 SILs from U.S. EPA 2018 Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permit Program (U.S. EPA 2018).
[b] SIL values provided in 40 CFR 51.165(b)
[c] Interim NO_2 SIL (U.S. EPA 2011)
[d] Interim SO_2 SIL (U.S. EPA 2010)
Sources: U.S. EPA 2010, U.S. EPA 2011, U.S. EPA 2018

2 Class I federal lands include areas such as national parks, national wilderness areas, and national monuments. These areas are granted special air quality protections under the federal Clean Air Act. All other areas that attain the NAAQS are initially designated as Class II, and can be redesignated as either Class I or Class III. Class III designation indicates areas where substantial industrial or other growth is allowed and where increases in concentrations up to the national standards would be insignificant.

5.1.2.2 Direct and Indirect Impacts

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

Construction and Operation

Less Than Significant Impact with Mitigation Incorporated. The ICAPCD has the responsibility to develop the applicable air quality management plans and regulations to achieve the air quality standards consistent with the plans. Additionally, the ICAPCD has the authority to adopt and enforce rules and regulations to achieve and maintain the state and federal ambient air quality standards, as necessary to implement the air quality management plans.

To determine if a project would conflict with or obstruct implementation of the applicable air quality plan, lead agencies must demonstrate that a given project would not directly obstruct implementation of an applicable air quality plan and that the project would be consistent with the assumptions upon which the air quality plan is based. Each air quality management plan includes emission inventory, population, and employment growth forecasts that are relied upon for projecting how attainment is achieved.

New sources of emissions would be conditioned to comply with ICAPCD air permitting requirements, including operating limitations and applicable emission standards that form the basis of attainment planning. Construction and operation activities would occur in compliance with applicable federal, state, and local requirements, including those that are relied upon for attainment planning. Compliance with air permitting requirements, and other applicable requirements, ensures that proposed project emissions are included within the emission inventory forecasts that are relied upon for attainment planning.

For these reasons, the project would be consistent with the applicable air quality plans. The project with mitigation would have a less than significant impact related to implementation of the applicable air quality management plans.

b. 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?

Construction

Less Than Significant with Mitigation Incorporated. Project construction emissions include onsite and offsite emissions. Onsite construction emissions from project construction would result from the use of onsite construction equipment, onsite fugitive dust emissions from grading, materials dumping and loading, and travel on paved and unpaved road, paving activities, and emissions from vehicles traveling and idling onsite. Offsite construction emissions will be derived primarily from materials transport to and from the site, and worker travel. Emissions from the 24-month construction period were estimated

using the California Emissions Estimator Model (CalEEMod) program. The estimated criteria pollutant construction phase emissions are summarized in **Table 5.1-6**.

The average daily emissions shown in **Table 5.1-6** indicate that construction emissions would be lower than the applicable ICAPCD significance thresholds for all criteria pollutants except for NOx. An exceedance of the significance thresholds does not necessarily indicate the project would have significant impacts but does indicate the need for additional analysis.

The CEC staff air quality impact analysis for project construction conducted under CEQA environmental checklist criterion "c" concluded that project construction would not expose sensitive receptors to substantial criteria pollutant concentrations, and thus have a less than significant impact. **Table 5.1-11** shows that the impacts from project construction would be below the limiting standards for PM2.5, CO, NO_2, and SO_2.

Staff generally concurs with the applicant's proposed measures and recommends mitigation measures **AQ-SC1** through **AQ-SC5**. Mitigation measures **AQ-SC1** through **AQ-SC5** would ensure that PM10 and PM2.5 emissions are maintained to a level that is not a considerable increase of these pollutants. The project's impact would thus be considered less than significant.

Construction emissions for the offsite switching station (described in Section 3.2.5), offsite piping, laydown yards and temporary worker housing (described in Section 3.4) were not included in the applicant's emissions calculations. However, given the characterization of these offsite components which have minimal or no construction, a smaller footprint and consequently no or lower amounts of ground disturbance activities, shorter duration of construction, if any, lower amount of associated construction equipment, similar distance to sensitive receptors, impacts from any construction of the additional project components are expected to be lower than those of the analyzed project construction emissions. Impacts from construction of the additional project components are therefore expected to be less than significant. To the extent construction of an offsite component does create a significant impact through dust and other emissions, the permitting jurisdiction can mitigate impacts through implementation of mitigation measures **AQ-SC1** through **AQ-SC5.**

TABLE 5.1-6 CRITERIA POLLUTANT EMISSIONS FROM PROJECT CONSTRUCTION

Pollutant	Average Daily Emissions (lbs/day) [a]	Maximum Construction Emissions (tons/period)	ICAPCD Significance Thresholds for Construction-related Average Daily Emissions (lbs/day) [c]	Threshold Exceeded ?
ROG/VOC	46.1	15.4	75	No
CO	478	159	550	No
NOx	119	39.8	100	Yes
SOx	1.15	0.38	None	N/A
PM10[b]	23.1	7.71	150	No
PM2.5[b]	17.2	5.73	None	N/A

Notes:
[a] Average daily emissions are the total estimated construction emissions averaged over months in which heavy construction workdays is expected
[b] PM10 and PM2.5 estimates include both fugitive dust and exhaust emissions
[c] ICAPCD 2017, Table 4
Source: Jacobs 2023pp, CEC staff analysis

Operation

Less Than Significant with Mitigation Incorporated. Operation emissions include PGF steam-related emissions and ancillary operation emissions. The PGF steam-related emission sources include a mobile testing unit (MTU) that is temporarily deployed at each well head during commissioning only, two production testing units (PTU) which are located on top of two warm-up atmosphere flash tanks (AFTs) (one PTU per warm-up AFT), a rock muffler (RM), and the cooling tower cells (14 total). The ancillary operation emissions occur through the operations of one diesel fire water pump, three 3.25 MW diesel-fired emergency generators (generators), gas-insulated equipment, a hydrochloric acid (HCl) scrubber, and O&M equipment and vehicles. Each of these emission sources is described in more detail below.

PGF Steam-related Processes: Emissions were estimated based upon analytical data from other geothermal power plants in the area. The analytical data consists of a speciated breakdown of concentrations from a non-condensable gas (NCG) sample, and system inlet and outlet operations from the geothermal system's geothermal steam flows. The Project's geothermal steam flows vary in pressure and are categorized as high, standard, and low pressure, each of which has an assumed NCG concentration. The NCG and system inlet/outlet analytical data are applied to production well estimated steam flows to determine a total mass of species through the geothermal system. During processing and condensing of the geothermal steam, a portion of the species remain in gas phase and are routed through the sparger installed inside the cooling tower basin; the remaining condensed liquid portion of the species are routed through the biological oxidation box and then overflows to the cooling tower. The mass throughputs of these species are used in coordination with estimated control efficiencies and process-specific correction factors to estimate emissions.

Cooling Towers: Emissions were estimated based upon two input streams: the gaseous NCG vented into the cooling towers from the PGF steam and the NCG condensate/liquid within the cooling towers. The gaseous NCG stream was characterized using analytical data from other geothermal power plants in the area. Liquid-based emissions are the result of NCG condensate and make-up water input into the cooling towers for circulation. PM emissions from the circulating water were estimated using predicted permit limits of total dissolved solids (TDS). A particle size distribution was applied to TDS emissions to determine PM10 and PM2.5 emissions. As outlined in the CARB California Emissions Inventory Data and Reporting System database, 70 percent of total particulate matter was assumed to be PM10 and 42 percent of total particulate matter was assumed to be PM2.5. VOC emissions were developed by applying hot well analytical data from other geothermal power plants in the area to the Project's estimated hot well flow rates. 100 percent of the VOC emissions in the hot well condensate are assumed to be emitted through the cooling towers.

Diesel Fire Pump: Criteria pollutant emissions from the diesel fire pump engine were estimated based upon vendor-provided data for a Tier 3-certified unit, with the exception of SO_2. The emission of sulfur dioxide (SO_2) are calculated based on ultra-low sulfur diesel fuel with a sulfur content not to exceed 15 ppm by weight.

Diesel-fired Emergency Generators: Criteria pollutant emissions from the three generators were estimated based upon vendor-provided data, with the exception of SO_2. The vendor-provided data indicate that the engines will be compliant with Tier-4 emission rates through the use of a selective catalytic reduction (SCR) control device, diesel particulate filter, and diesel oxidation catalyst. SO_2 emissions were estimated based on ultra-low sulfur diesel fuel with a sulfur content not to exceed 15 ppm by weight.

Insulating Gas Emissions: Emissions from the selected insulating gas were estimated based upon California's Regulation for Reducing Greenhouse Gas Emissions from Gas-Insulated Equipment (California Code of Regulations [CCR], Title 17, Section 95353, Tables 4 and 5) for data years through 2034.

O&M Equipment: Emissions were estimated using construction equipment emission factors, horsepower, and load factors from the CalEEMod User's Guide (ICF 2022).

O&M Vehicles: Emissions from vehicle exhaust and idling were calculated using emission factors from EMFAC2021.

HCl Scrubber: Emissions from the HCl scrubber associated with the bulk concentrated HCl storage tank were developed by mass balance using Henry's Law and a conservative estimate that tank loading operations could occur 8,760 hours per year.

The estimated project operation emissions represent the highest potential emissions based on the applicant's proposed operational scenarios. The hourly and annual emissions for all criteria pollutants are based upon a series of worst-case assumptions for each

pollutant. The applicant provides the detailed project operation scenarios and the associated hours of operations in **Table 5.1-7**.

TABLE 5.1-7 FACILITY OPERATING HOUR SUMMARY

Project Operations		**First Year**	**Subsequent Year with Startups, Shutdowns and Emission Control Downtime**	**Subsequent Year without Startups, Shutdowns and Emission Control Downtime**
Production Well Flow Back		216	216	0
Production Well Testing		2,160	0	0
Injection Well Flow Back		264	264	0
Injection Well Testing		2,640	0	0
Commissioning	Well Warm-up	216	0	0
	Production Line and Equipment Warm-up	48	0	0
	Steam Blow	240	0	0
	Turbine Preheat and Auxiliary Loop	48	0	0
	Turbine Load Test	72	0	0
	Turbine Performance Test	48	0	0
Cold Startup	Well Warm-up	120	120	0
	Production Line and Equipment Warm-up	32	32	0
	Turbine Preheat and Auxiliary Loop	24	24	0
	Auxiliary Equipment Startup	12	12	0
	Functional Trip Test	6	6	0
	Gradual Steam Delivery to Turbine	6	6	0
Warm Startup	Step 1 (Geothermal Steam sent to RM)	200	200	0
	Step 2 (Gradual Diversion of Steam from RM to Turbine)	200	200	0
Shutdowns		198	198	0
Routine Power Generation Operation	With Controls	1,610	7,082	8,760
	Sparger Bypass/Breakdown	200	200	0
	Biological Oxidation Box Bypass/Breakdown	200	200	0
Total Operating Hours		8,760	8,760	8,760

Source: Jacobs 2023ii

Table 5.1-8 provides the worst-case hourly emissions for each of the project's emission sources.

TABLE 5.1-8 MAXIMUM FACILITY-WIDE HOURLY EMISSIONS (LBS/HR)

Pollutant	PTU	MTU	RM	Cooling Tower & Sparger	Fire Pump	Emergency Generators	O&M, Insulating Gas, HCl Scrubber
NOx	--	--	--	--	1.78	14.4	8.31
CO	--	--	--	--	0.42	75.2	24.1
VOC	0.08	0.13	0.51	0.46	0.05	4.08	0.81
SOx	--	--	--	--	<0.01	<0.01	0.07
PM10	--	--	--	3.59	0.06	0.64	0.53
PM2.5	--	--	--	2.15	0.06	0.64	0.29
H_2S	24.8	40.4	154	138	--	--	--
Ammonia	0.25	0.40	1.54	121	--	1.01	--

Source: Jacobs 2023ii
Note: [a] Operation of PTU, MTU, RM and cooling tower will not occur in the same hour. Therefore, the facility total emissions only count for the maximum of emissions from these emission sources.

Table 5.1-9 presents the project daily emissions for all criteria pollutants.

TABLE 5.1-9 MAXIMUM FACILITY-WIDE DAILY EMISSIONS (LBS/DAY)

Pollutant	Project Daily Emissions
NOx	64.6
CO	212
VOC	24.7
SOx	0.16
PM10	88.9
PM2.5	54.1

Source: Jacobs 2023ii

Table 5.1-10 provides the facility-wide annual emission estimates. The operational profiles presented include scenarios for the first operating year, including plant commissioning and testing activities; a subsequent operating year without commissioning and testing activities but with all proposed startups, shutdowns, and emission control downtime; and a subsequent operating year assuming 8,760 hours of routine power generation operation (i.e., without any startups, shutdowns, or emission control downtime).

TABLE 5.1-10 MAXIMUM FACILITY-WIDE ANNUAL EMISSIONS (TPY)			
Pollutant	**First Year of Operation**	**Subsequent Year of Operation with Startups, Shutdowns and Emission Control Downtime**	**Subsequent Year of Operation without Startups, Shutdowns and Emission Control Downtime**
NOx	2.00	2.00	2.00
CO	8.35	8.35	8.35
VOC	1.35	2.15	2.28
SOx	0.02	0.02	0.02
PM10	3.73	13.5	15.8
PM2.5	2.23	8.12	9.50
H_2S	183	65.6	8.92
Ammonia	179	476	493

Source: Jacobs 2023ii

District Rule 207 requires emission offsets for any new or modified stationary emission source with a PTE greater than 137 pounds per day for VOCs, PM10, NOx, or SOx. The project's operation emissions will not exceed these thresholds and therefore will not be required to offset those emissions. For CO, the threshold of 137 lbs/day also applies but offsets are not required if the source is in CO attainment areas (Rule 207, C.2.h), which is the case of this project. As discussed under **Section 5.1.2.2c** and "Cumulative Impacts" subsection below, project operation would not expose sensitive receptors to substantial criteria pollutant concentrations with mitigation measures. Therefore, the project's operations would not result in a cumulatively considerable net increase of any criteria pollutant, and the impact of criteria pollutants would be less than significant.

c. Would the project expose sensitive receptors to substantial pollutant concentrations?

This section quantifies the ambient air quality pollutant concentrations caused by the project and determines whether sensitive receptors could be exposed to substantial pollutant concentrations.

This section addresses impacts from criteria pollutants in staff's Air Quality Impact Analysis (AQIA). Staff's AQIA discusses criteria pollutant impacts from construction and operation. **Section 5.10 Public Health** discusses the results of toxic air contaminants for both construction and operation.

Air Quality Impact Analysis for Criteria Pollutants

Staff considers any new AAQS exceedance and substantial contribution to any existing AAQS exceedance caused by the project's emissions to be substantial evidence of potentially significant impacts that would require the evaluation of potential mitigation

measures. In this case, the project area in ICAPCD is classified as nonattainment for ozone and PM10 CAAQS.

Construction

Less Than Significant with Mitigation Incorporated. Construction emissions of criteria pollutants are shown in **Table 5.1-6** under criterion "b" of the CEQA environmental checklist. **Table 5.1-6** shows that criteria pollutant emissions during project construction would not exceed significance thresholds for construction activities except for NOx. An exceedance of the significance thresholds does not necessarily indicate the project would have significant impacts but does indicate the need for additional analysis. This section of the staff analysis explores the ambient air quality impacts of criteria pollutant emissions during construction to evaluate whether substantial pollutant concentrations could occur.

The applicant provided the modeled ambient air quality concentrations caused by the construction emissions (Jacobs 2023ii). CEC staff reviewed the applicant's dispersion modeling files and agrees with the inputs used by the applicant and the outputs from the model for the construction AQIA for all criteria pollutants.

The applicant's AQIA uses the U.S. EPA preferred and recommended dispersion model, AERMOD (Version 22112) to estimate ambient air quality impacts. For the 1-hour NO_2 modeling analysis, the applicant used the Ambient Ratio Method #2 (ARM2) with default minimum/maximum NO_2/NOx ambient ratios of 0.5/0.9 in AERMOD, as described in U.S. EPA's Guideline on Air Quality Models (U.S. EPA 2017).

Meteorological Data. Five years of meteorological data from the Imperial County Airport were obtained from the CARB Hotspots Analysis and Reporting Program (HARP) AERMOD Meteorological Files webpage[3]. The five years of data were processed by CARB with AERMET, AERMOD's meteorological data preprocessor module, Version 19191 for 2015 through 2018 and 2021. The years 2019 and 2020 were not included in the meteorological data set because they were likely determined to be incomplete by CARB. Even though the Imperial County Airport station is approximately 25.1 miles south of the project, it is still considered representative of the project site because there are no significant geographic features between the two locations and both are south/southeast of the Salton Sea.

Modeling Assumptions. The applicant modeled combustion emissions from mobile sources, including diesel construction-type equipment and onsite vehicles, and fugitive dust emissions. To represent the onsite equipment and vehicle exhaust emissions, the applicant placed a grid of point sources with a horizontal stack release spaced approximately 25 meters (m) apart over the entire construction area. For modeling fugitive dust emissions from roadways, grading activities, and material loading/unloading, the applicant used a single area-poly source within the property, with a 10-m buffer from the nearest property boundary and assuming a ground-level release. This approach is

3 Available online at: https://ww2.arb.ca.gov/resources/documents/harp-aermod-meteorological-files.

conservative for modeling ground-level fugitive emissions with no initial vertical dimension and assumes grading activities would not continuously occur within 10 m of the proposed facility fence line (Jacobs 2023ii).

Table 5.1-11 shows the impacts of the project during the construction period. The project impact column shows the worst-case impacts of the project from modeling. The background column shows the highest concentrations, or the three-year averages of the highest concentrations for 24-hour PM2.5 and federal 1-hour NO_2 and SO_2 standards according to the forms of these standards, from the prior three years (2020-2022). The background data are from the closest and most representative ambient air monitoring stations as described above.

The background PM10 concentrations are shown in **bold** because they already exceeded the CAAQS. The total impact column shows the sum of the existing background condition plus the maximum impact predicted by the modeling analysis for construction. The limiting standard column combines CAAQS and NAAQS, whichever is more stringent.

TABLE 5.1-11 MAXIMUM AMBIENT AIR QUALITY IMPACTS DURING CONSTRUCTION (µg/m³)

Pollutant	Averaging Time	Project Impact	Background	Total Impact	Limiting Standard	Percent of Standard
PM10	24-hour	8.4	**474.7**	**483.1**	50	**966%**
	Annual	1.5	**48.6**	**50.1**	20	**251%**
PM2.5 [a]	24-hour	1.4	24.5	25.9	35	74%
	Annual	0.3	9.4	9.7	12	81%
CO	1-hour	146.8	5,726	5,873	23,000	26%
	8-hour	120.4	4,123	4,243	10,000	42%
NO_2 [b]	State 1-hour	61.8	105.0	166.8	339	49%
	Federal 1-hour	58.7	70.6	129.3	188	69%
	Annual	11.3	14.9	26.2	57	46%
SO_2 [c]	State 1-hour	0.34	22.5	22.9	655	3%
	Federal 1-hour	0.34	16.6	16.9	196	9%
	24-hour	0.18	7.1	7.3	105	7%
	Annual	0.1	1.1	1.2	80	2%

Notes: Concentrations in **bold** type are those that exceed the limiting ambient air quality standard.
[a] To compute the total impacts for the 24-hour PM2.5 NAAQS, staff conservatively combined the maximum modeled 24-hour PM2.5 impacts to the three-year average of 98th percentile PM2.5 background.
[b] NO_2 impacts are evaluated with ARM2 option in AERMOD, with U.S. EPA-default minimum/maximum NO_2/NOx ambient ratios of 0.5/0.9. The state 1-hour NO_2 total impacts include the maximum modeled project impact combined with maximum NO_2 background value. The federal 1-hour NO_2 total impacts include the modeled 5-year average of 98th percentile daily maximum 1-hour NO_2 project impact combined with 3-year average of 98th percentile daily maximum 1-hour background NO_2.
[c] To compute the total impacts for the 1-hour SO_2 NAAQS, staff conservatively combined the maximum modeled 1-hour SO_2 impacts to the three-year average of 99th percentile SO_2 background.
Sources: Jacobs 2023ii, Table 5.1-35 with modeling files, CEC staff analysis

Table 5.1-11 shows that the impacts from project construction would be below the limiting standards for PM2.5, CO, NO_2, and SO_2. **Table 5.1-11** also shows that the existing 24-hour and annual PM10 background concentrations are already above the CAAQS. The project would, therefore, contribute to existing exceedances of the 24-hour and annual PM10 CAAQS. The maximum modeled 24-hour PM10 impact of 8.4 µg/m^3 from project construction would exceed the U.S. EPA PM10 SILs of 5 µg/m^3 for 24-hour impacts. The maximum modeled annual PM10 concentration of 1.5 µg/m^3 would exceed the PM10 SILs of 1 µg/m^3 for annual impacts. However, the results provided in **Table 5.1-11** are maximum impacts predicted to occur primarily due to fugitive dust at the project fence line. Thus, practices that reduce the generation of dust during construction will reduce the levels of PM10 throughout the project site. The impacts would decrease rapidly with distance from the fence line, and for any location beyond 75 m (246 feet) of the fence line, the PM10 impacts would be below the U.S. EPA PM10 SILs levels. The closest residence (sensitive receptor) to the project site is about 2,160 m (about 1.3 miles) north-northeast of the project boundary (based on staff analysis of applicant's modeling files). The maximum PM10 impacts at the nearest sensitive receptors would be lower than PM10 SILs levels. In addition, construction is considered short term, and the impacts to the general population and sensitive populations during construction would be reduced with the implementation of **AQ-SC1** through **AQ-SC5**. With mitigation, the PM10 impacts of the project during construction would be less than significant.

Table 5.1-11 also shows that construction emissions from the project would result in maximum modeled impacts that exceed the U.S. EPA SILs for 1-hour NO_2 of 7.5 µg/m^3, annual NO_2 of 1 µg/m^3, and annual PM2.5 of 0.2 µg/m^3. As discussed in more detail under "Cumulative Impacts" subsection below, the applicant performed a localized cumulative impacts modeling analysis for 1-hour and annual NO_2 and annual PM2.5 during project construction to determine whether the project combined with other local emission sources would expose sensitive receptors to substantial pollutant concentrations.

Secondary Construction Impacts from Precursors. The applicant estimated the secondary formation of PM2.5 and ozone from emissions of their precursors during construction. The secondary impacts of PM2.5 and ozone would be well below the corresponding SILs levels (Jacobs 2023ii). Therefore, secondary impacts of PM2.5 and ozone during construction would be less than significant.

With the implementation of **AQ-SC1** through **AQ-SC5**, project construction would not expose sensitive receptors to substantial criteria pollutant concentrations, and this impact would be less than significant.

Operation

Less Than Significant with Mitigation Incorporated. The AQIA for project operation includes emissions from the cooling tower, generators, diesel fire water pump, production testing units (PTU), mobile testing unit (MTU), rock muffler (RM), and HCl scrubber. The MTU would operate prior to the other emission sources during the commissioning year, therefore, it is assumed to not operate concurrently with any routine operations.

Emissions from operations and maintenance equipment and vehicles were not modeled as those operations are infrequent, varied spatially throughout the project site, and assumed to have a negligible impact on ground-level concentrations relative to the project's other emission sources.

The applicant's AQIA compares worst-case ground-level impacts resulting from the project operation with established state and federal AAQS. Staff reviewed the applicant's dispersion modeling files, and staff agrees with the inputs used by the applicant and the outputs from the model for the AQIA, except for the 1-hour H_2S impacts analysis as discussed in detail below.

Modeling Assumptions. Stack parameters (e.g., stack height, exit temperature, stack diameter, and stack exit velocity) were based on the parameters given by the vendor data and the applicant. The cooling tower represent emissions from the cooling tower process as well as the sparger. Emissions from direct release of geothermal steam through the PTU, the RM and the MTU are modeled as point sources. A single MTU is expected to be moved from well pad to well pad for a limited number of hours during commissioning. The applicant modeled the maximum hourly emissions at each MTU location (well pad) for worst-case 1-hour impacts analysis and modeled annual emissions as being evenly distributed amongst all MTU locations for annual impacts (Jacobs 2023ii).

The emergency generators would be equipped with Tier 4 certified engines. Normally the SCR control device used to control NOx emissions needs time to warm up before it can reach full control effectiveness. In the absence of manufacturer-provided data regarding the engine warm-up period, the applicant assumed the engine would warm up from an uncontrolled Tier 2 state during the first 15 minutes to a fully controlled Tier 4 state for the remainder of the one-hour test. For the 1-hour NO_2 modeling analysis, the applicant used the Ambient Ratio Method #2 (ARM2) with default minimum/maximum NO_2/NOx ambient ratios of 0.5/0.9 in AERMOD, as described in U.S. EPA's Guideline on Air Quality Models (U.S. EPA 2017). The applicant assumed only one (1) diesel-fired emergency generator or the diesel fire water pump would operate in a single hour (Jacobs 2024n). Staff proposes to add this condition as Condition of Certification **AQ-SC7**.

For modeling purposes, the fire pump is assumed to operate one hour per day and the generators are assumed to operate up to 2 hours per day and once per 8-hour period, all of which are conservatively assumed to potentially occur within the same day.

For analysis relative to the state one-hour NO_2 standard, the maximum modeled 1-hour NO_2 results from AERMOD are added to the maximum 1-hour background NO_2 value to arrive at the total NO_2 impact to compare with the 1-hour NO_2 CAAQS. For the 1-hour NO_2 NAAQS analysis, the applicant used an hourly emission rate averaged from the annual emissions of the intermittent testing according to the U.S. EPA guidance for the NO_2 NAAQS (U.S. EPA 2011). The modeled 5-year average of 8th-highest of the daily maximum 1-hour values are then added to the 3-year average of 98th percentile daily maximum 1-hour background NO_2 concentration, consistent with the U.S. EPA guidance for the NO_2 NAAQS (U.S. EPA 2011).

Table 5.1-12 shows the maximum impacts from project operation, except for the H_2S impacts which are shown in **Table 5.1-13**. The project impact column shows the worst-case impacts of the project from modeling. The background column shows the highest concentrations, or the three-year averages of the highest concentrations for 24-hour PM2.5 and federal 1-hour NO_2 and SO_2 standards according to the forms of these standards, from the prior three years (2020-2022). The background PM10 concentrations are shown in **bold** because they already exceeded the CAAQS. The total impact column shows the sum of the existing background condition plus the maximum impact predicted by the modeling analysis for operation. The limiting standard column combines CAAQS and NAAQS, whichever is more stringent.

TABLE 5.1-12 MAXIMUM AMBIENT AIR QUALITY IMPACTS DURING OPERATION (µg/m³)

Pollutant	Averaging Time	Project Impact	Background	Total Impact	Limiting Standard	Percent of Standard
PM10	24-hour	7.2	**474.7**	**481.9**	50	**964%**
	Annual	0.7	**48.6**	**49.3**	20	**247%**
PM2.5 [a]	24-hour	4.4	24.5	28.9	35	83%
	Annual	0.4	9.4	9.8	12	82%
CO	1-hour	1,326.6	5,726	7,053	23,000	31%
	8-hour	119.6	4,123	4,242	10,000	42%
NO_2 [b]	State 1-hour	138.7	105.0	243.7	339	72%
	Federal 1-hour	1.3	70.6	71.9	188	38%
	Annual	0.1	14.9	15.0	57	26%
SO_2 [c]	State 1-hour	0.001	22.5	22.5	655	3%
	Federal 1-hour	0.001	16.6	16.6	196	8%
	24-hour	0.00003	7.1	7.1	105	7%
	Annual	0.00000	1.1	1.1	80	1%

Notes: Concentrations in **bold** type are those that exceed the limiting ambient air quality standard.
[a] To compute the total impacts for the 24-hour PM2.5 NAAQS, staff conservatively combined the maximum modeled 24-hour PM2.5 impacts to the three-year average of 98th percentile PM2.5 background.
[b] NO_2 impacts are evaluated with ARM2 option in AERMOD, with U.S. EPA-default minimum/maximum NO_2/NOx ambient ratios of 0.5/0.9. The state 1-hour NO_2 total impacts include the maximum modeled project impact combined with maximum NO_2 background value. The federal 1-hour NO_2 total impacts include the modeled 5-year average of 98th percentile daily maximum 1-hour NO_2 project impact combined with 3-year average of 98th percentile daily maximum 1-hour background NO_2.
[c] To compute the total impacts for the 1-hour SO_2 NAAQS, staff conservatively combined the maximum modeled 1-hour SO_2 impacts to the three-year average of 99th percentile SO_2 background.
Sources: Jacobs 2023ii, Table 5.1-31, Jacobs 2024n, Table DR13-3 with modeling files, CEC staff analysis

Table 5.1-12 shows that the impacts from project operation would be below the limiting standards for PM2.5, CO, NO_2, and SO_2. **Table 5.1-12** also shows that the existing 24-hour and annual PM10 background concentrations are already above the CAAQS. The project would, therefore, contribute to existing exceedances of the 24-hour and annual

PM10 CAAQS. The maximum modeled 24-hour PM10 impact of 7.2 µg/m^3 from project operation would exceed the U.S. EPA PM10 SILs of 5 µg/m^3 for 24-hour impacts. However, the results provided in **Table 5.1-12** are maximum impacts predicted to occur at the project fence line. The impacts would decrease rapidly with distance from the fence line, and for any location beyond 30 m (98 feet) of the fence line, the 24-hour PM10 impacts would be below the U.S. EPA PM10 SILs levels. The closest residence (sensitive receptor) to the project site is about 2,160 m (about 1.3 miles) north-northeast of the project boundary (based on staff analysis of applicant's modeling files). The 24-hour PM10 impacts at the sensitive receptors would be below the U.S. EPA PM10 SILs levels.

In addition, the maximum modeled annual PM10 concentration of 0.7 µg/m^3 would not exceed the PM10 SILs of 1 µg/m^3 for annual impacts. Therefore, the PM10 impacts of the project during operation would be less than significant.

Table 5.1-12 also shows that operation emissions from the project would result in maximum modeled impacts that exceed the U.S. EPA SILs for 24-hour PM2.5 of 1.2 µg/m^3 and annual PM2.5 of 0.2 µg/m^3. As discussed in more detail under "Cumulative Impacts" subsection below, the applicant performed a localized cumulative impacts modeling analysis for 24-hour and annual PM2.5 during project operation to determine whether the project combined with other local emission sources would expose sensitive receptors to substantial pollutant concentrations.

Project operation would not expose sensitive receptors to substantial criteria pollutant concentrations, and therefore this impact would be less than significant.

H_2S Impacts. H_2S is regulated as a nuisance based on its odor detection level. The H_2S standard of 0.03 ppm (or 42 µg/m^3) for a one-hour average was adopted in 1969 for the purpose of odor control. However, additional health effects of H_2S have only been reported with exposures greater than 50 ppm (eye irritation), considerably higher than the odor threshold-based standard. If the standard were based on adverse health effects, it would be set at a much higher level (CARB 2024a). For example, the Occupational Safety and Health Administration (OSHA) set an acceptable ceiling limit of 20 ppm (or 28,000 µg/m^3) for H_2S in workplace air. The ceiling limit is a 15-minute timeweighted average that cannot be exceeded at any time during the working day. The National Institute for Occupational Safety and Health (NIOSH) recommends a 10-minute ceiling limit of 10 ppm (or 14,000 µg/m^3). NIOSH also determined that 100 ppm (or 140,000 µg/m^3) is immediately dangerous to life or health of workers (ATSDR 2024).

H_2S in the ambient air near the Salton Sea is subject to episodic events that result in concentrations which temporarily exceed the CAAQS. These episodic events of H_2S exceedances are well known and largely due to biogenic sources and activity (SCAQMD 2021). As a result, monitoring data in the region may not be representative for use in a CAAQS modeling analysis and the project's modeled maximum impacts are instead be compared to the CAAQS directly.

The impacts tables from the applicant only show H_2S impacts for routine operations of the cooling tower, sparger, and biological oxidation box. The applicant states that emissions resulting from the PTU, RM, and cooling tower/sparger/biological oxidation box bypass operations are limited, infrequent, and not to occur in the same hour as routine operation of the cooling tower, sparger, and biological oxidation box (Jacobs 2023ii). Therefore, the applicant did not include these emission sources in the H_2S impacts analysis.

CEC staff agrees that the sparger and biological oxidation box bypass operations are only expected to occur during breakdown scenarios in which the associated control equipment is not properly functioning. Although these breakdown scenarios are possible, they are not considered reasonably foreseeable. Furthermore, these breakdown operations would be limited in duration by ICAPCD Rule 111, which provides that breakdown conditions must be remedied within 24 hours of the event. If not remedied within that time, the facility must be shut down. Therefore, staff concludes that assessing the short-term impacts of the sparger and biological oxidation box bypass operations would be speculative due to the infrequent, irregular, and unplanned nature of such operations. The sparger and biological oxidation box bypass operations would be unlikely to expose sensitive receptors to substantial concentrations of criteria air pollutants.

However, staff considers the PTU and RM operations during commissioning, startups, and shutdowns to be more reasonably foreseeable than the sparger and biological oxidation box bypass operations. RM would operate 336 hours during commissioning year and a total of 572 hours in subsequent years (74 hours during cold startups, 300 hours during warm startups, and 198 hours during shutdowns). PTU would operate 216 hours during commissioning year and 120 hours during cold startups in subsequent years (Jacobs 2023nn). For a conservative analysis, staff presents the worst-case modeled H_2S impacts from PTU and RM as well as from routine operations in **Table 5.1-13**. The PTU and RM impacts are separately reported from the routine operations, assuming PTU and RM would not occur in the same hours as routine operations of the cooling tower, sparger, and biological oxidation box. Staff's independent modeling analysis also shows that the worst-case 1-hour H_2S impacts of these emission sources would not overlap with each other.

In addition, per CEC staff request, the applicant analyzed the 1-hour H_2S impacts from the MTU and the results are also separately reported in **Table 5.1-13** from the routine operations impacts because the MTU operations would not occur concurrently with any onsite operations and only occur prior to the other emission sources coming online during the once-in-a-lifetime commissioning.

Table 5.1-13 shows the maximum modeled 1-hour H_2S impacts from project routine operations, PTU, RM, and MTU operations. The column "Maximum Modeled Impact in Modeling Domain" shows results modeled at any receptor in the modeling domain (within 10,000 m from the fence line) during the five modeling years. These results are usually modeled at or near the project fence line or MTU well pad locations. The results indicate the 1-hour H_2S CAAQS of 42 $\mu g/m^3$ may be exceeded by PTU, RM, and MTU operations if they would occur during worst-case meteorological conditions. However, the impacts

would be much lower than the NIOSH 10-minute ceiling limit of 14,000 µg/m^3 (or 10 ppm) and OSHA acceptable ceiling limit of 28,000 µg/m^3 (or 20 ppm). Therefore, any temporary H_2S exceedances would be characterized as a nuisance rather than an issue of public health.

It should be noted that the results shown in **Table 5.1-13** are based upon a five-year meteorological data period and represent the worst-case conditions that occur during that period. Therefore, the results represent a low-likelihood situation given the probability of the limited operations of PTU, RM, and MTU occurring during worst-case meteorological conditions. For RM operations, the worst-case modeled probability of H_2S impacts exceeding the CAAQS of 42 µg/m^3 would only be 0.2 percent (=1377/(5*8760)*572/8760) at the project fence line and decrease rapidly with distance from the fence line. For PTU operations, the worst-case modeled probability of H_2S impacts exceeding the CAAQS of 42 µg/m^3 would only be 0.03 percent (=503/(5*8760)*216/8760) at the project fence line and decrease rapidly with distance from the fence line. For MTU operations, the worst-case modeled probability of H_2S impacts exceeding the CAAQS of 42 µg/m^3 would only be 0.04 percent (=609/(5*8760)*240/8760) at the MTU well pad locations and decrease rapidly with distance from the MTU well pad locations.

In addition, there is a low probability that a single person would be within the area with modeled H_2S impacts exceedance during these operations and coincident worst-case meteorological conditions. **Table 5.1-13** also shows the "Maximum Modeled Impact at Residential Receptors". The results show that the maximum modeled 1-hour H_2S impacts at residential receptors would not exceed the 1-hour H_2S CAAQS. The project H_2S emissions would not expose residential receptors to substantial concentrations of H_2S.

In summary the results of the H_2S modeling show there is less than a half of a percent chance that an exceedance of the H_2S standard for nuisance odor will occur at the fence line and no exceedances will occur at the nearest residences. Based on this low probability of a nuisance odor at the fence line, the project would have a less than significant impact relating to H_2S emissions.

Also, as discussed in **Section 5.10 Public Health**, since the applicant owns the land on which the hazard indices are being exceeded, public access to those areas would be restricted (Jacobs 2024v). The applicant would also comply with the public notification requirements for the project's acute risks (Jacobs 2024w).

TABLE 5.1-13 MAXIMUM H_2S IMPACTS DURING OPERATION/COMMISSIONING (µg/m³)

Emission Source	Averaging Time	Maximum Modeled Impact in Modeling Domain	Maximum Modeled Impact at Residential Receptors	CAAQS [a]	Exceeds CAAQS at Residential Receptors?
Routine Operations	1-hour	37.5	6.1	42	No
PTU		154.8	11.5	42	No
RM		386.2	39.9	42	No
MTU		148.4	26.0	42	No

Note: [a] The H_2S CAAQS of 0.03 ppm (or 42 µg/m³) for a one-hour average was adopted based on its odor detection level. If the standard were based on adverse health effects, it would be set at a much higher level. For example, OSHA set an acceptable ceiling limit of 28,000 µg/m³ (or 20 ppm) for H_2S in workplace air. NIOSH recommends a 10-minute ceiling limit of 14,000 µg/m³ (or 10 ppm [ATSDR 2024]).
Sources: Jacobs 2023ii, Table 5.1-31, Table 5.1-32 with modeling files, CEC staff analysis

Fumigation Impacts. The applicant conducted fumigation analysis for inversion breakup conditions using the AERSCREEN (Version 15181) dispersion model. The applicant also assessed shoreline fumigation impacts as the nearest distance to the shoreline of any large bodies of water is within 3 kilometers with the Salton Sea located less than 1,000 m to the west and northwest of the project. The results of the applicant's fumigation analysis in AERSCREEN indicated no meteorological hours fit the fumigation criteria. Therefore, no fumigation impacts are expected to occur from the project (Jacobs 2023ii).

Secondary Operation Impacts from Precursors. The applicant estimated the secondary formation of PM2.5 and ozone from emissions of their precursors during operation. The secondary operation impacts of PM2.5 and ozone would be well below the corresponding SILs levels (Jacobs 2023ii). Therefore, secondary impacts of PM2.5 and ozone during operation would be less than significant.

Emergency Operations Impacts for Criteria Pollutants. Emergency use of the emergency generators and the fire pump could occur in the event of a power outage or other disruption, upset, or instability that triggers a need for emergency backup power at the project.

The air quality impacts of the emergency generators and the fire pump during emergencies are not quantified below because the impacts of emergency operations are typically not evaluated during facility permitting and local air districts do not normally conduct an air quality impact assessment of such impacts. Modeling the air quality impacts of emergency operations would require a host of unvalidated, unverifiable, and speculative assumptions about when and under what circumstances such a hypothetical emergency would occur. Such a speculative analysis is not required under CEQA (CEQA Guidelines §§ 15064(d)(3), 15145), and, most importantly, would not provide meaningful information by which to determine project impacts.

Emergency operations would be very infrequent and would not occur routinely during the lifetime of the facility. Accordingly, the potential for any adverse impacts to ambient air quality concentrations would be a very-low probability event. The project's emergency operations would be unlikely to expose sensitive receptors to substantial concentrations of criteria air pollutants.

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

This section considers impacts that may arise from emissions other than criteria air pollutants and TACs, such as emissions that may lead to odors.

ICAPCD Rule 407 states that no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such persons or the public or which cause or have a natural tendency to cause injury or damage to business or property. The pollutant emitted by the project that is most likely to lead to a nuisance concern is H_2S.

Construction

Less Than Significant Impact. Minor odor sources during construction activities include diesel exhaust from heavy-duty equipment. Odors from construction activities near existing receptors would be temporary in nature and dissipate as a function of distance. Accordingly, the construction of the project is not expected to result in substantial emissions that may lead to odor impacts or impacts of emissions other than those of criteria pollutants and toxic air contaminants identified elsewhere in this analysis.

Fugitive dust emissions can also create a nuisance that can cause adverse effects. The project would comply with the construction fugitive dust control measures specified in **AQ-SC3** and so should not have substantial fugitive dust emissions during construction that could adversely affect a substantial number of people.

Therefore, the construction of the project would not result in other emissions, such as those leading to odors, that could adversely affect a substantial number of people and would have a less than significant impact.

Operation

Less Than Significant Impact. Project operation would result in emissions of H_2S, which is a known odorous compound. Staff incorporates its discussion on H_2S above and a finding of less than significant impacts.

As also stated above, sparger and biological oxidation box bypass operations are only expected to occur during breakdown scenarios in which the associated control equipment is not properly functioning. Assessing the impacts of the sparger and biological oxidation box bypass operations would be speculative due to the infrequent, irregular, and unplanned nature of such operations. Therefore, staff concludes that sparger and

biological oxidation box bypass operations would be unlikely to create objectionable odors affecting a substantial number of people and impacts would be less than significant.

Other potential odor sources from the project would include diesel exhaust from the fire pump engine, emergency generators, operation and maintenance equipment and vehicles. When compared to existing odor sources near the project site, which include emergency generators and agricultural equipment, odor impacts from the fire pump engine, emergency generators, operation and maintenance equipment and vehicles of the project would be similar.

The project operation would not result in odors or other emissions that could adversely affect a substantial number of people and would have a less than significant impact related to odors.

Cumulative

Less Than Significant with Mitigation Incorporated. "Cumulative impacts" are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines, §15355). Such impacts can be relatively minor and incremental yet still be significant because of the existing environmental background, particularly when considering other closely related past, present, and reasonably foreseeable future projects.

Under CEQA environmental checklist criterion "b" above, staff concludes that with the implementation of **AQ-SC1** through **AQ-SC5**, the project emissions would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard. In addition, the applicant provided a localized cumulative impacts analysis to determine whether the project combined with other local emission sources would expose sensitive receptors to substantial pollutant concentrations.

Localized Cumulative Impacts

The project and other reasonably foreseeable projects could cause impacts that would be locally combined and future projects would introduce stationary sources that are not included in the "background" conditions. Reasonably foreseeable future projects are those that are either currently under construction or in the process of being approved by a local air district or municipality. Projects that have not yet entered the approval process do not normally qualify as "foreseeable" since the detailed information needed to conduct this analysis is not available.

Projects with stationary sources located up to six miles from the proposed project site usually need to be considered by the cumulative analysis. Based on staff's modeling experience, beyond six miles there is no statistically significant concentration overlap for nonreactive pollutant concentration between two stationary emission sources. The applicant performed a review of other stationary emissions sources within a six-mile radius that have received construction permits but are not yet operational or are in the

permitting process. For previous power plant proceedings, CEC considered stationary sources with emissions of less than five tons per year (tpy) as *de minimis*. Based on staff's modeling experience, impacts areas of such sources would be very limited and it's unlikely they would contribute significantly to cumulative impacts. The stationary emission sources within six-mile radius of the project were screened to include only new or modified sources (individual emission units) that would cause a net increase of five tpy or more per modeled criteria pollutant. The only nearby proposed sources identified as having emissions greater than five tpy of criteria pollutant in the permitting process are the Elmore North Geothermal Project (ENGP) and the Black Rock Geothermal Project (BRGP). Therefore, the localized cumulative impact modeling analysis only included three projects: MBGP, ENGP, and BRGP.

Since each of the background monitoring stations is in an urban area with nearby major vehicle-related emission sources, the background concentrations from the monitoring stations represent conservative estimates of fugitive and existing stationary sources, such as the existing geothermal power plants, in the project vicinity. In addition, in the Responses to CURE Comments on the ICAPCD PDOC (Jacobs 2024w), the applicant explained that due to the limited SIL impact radius for the project (i.e. 0.3 kilometer [km] or less), it is unlikely that PM2.5 (pollutant of concern for cumulative modeling during operation as discussed below) impacts from nearby existing sources would overlap with the project's impact areas. The applicant also qualitatively demonstrated that it's unlikely that the project's highest PM2.5 impacts would overlap with the highest PM2.5 impacts from nearby existing sources, including J.L. Featherstone (i.e. Hudson Ranch Power Plant), because they would occur in the same general direction under the same meteorological conditions instead of overlapping in an area requiring different wind directions. Therefore, explicit modeling of the existing sources is not needed in the cumulative impacts analysis.

The applicant's cumulative impact analysis focuses on the pollutants and averaging periods for which the project exceeds the applicable SIL. For pollutants and averaging periods with a predicted concentration that is not significant (that is, if they are less than the SIL), the modeling is complete for that pollutant and averaging period and compliance with the NAAQS/CAAQS is demonstrated by not causing or contributing to a violation.

Localized Cumulative Impacts during Construction

Table 5.1-11 shows that construction emissions from the project would result in maximum modeled impacts that exceed the U.S. EPA SILs for 1-hour NO_2 of 7.5 µg/m^3, annual NO_2 of 1 µg/m^3, annual PM2.5 of 0.2 µg/m^3, 24-hour PM10 of 5 µg/m^3, and annual PM10 of 1 µg/m^3.

However, as discussed in detail in the construction impacts analysis under CEQA environmental checklist criterion "c" above, the area where the maximum modeled PM10 impacts exceed SILs is very small (within 75 m [246 feet] of the fence line). The maximum PM10 impacts at the nearest sensitive receptors would be lower than PM10 SILs. Due to the limited SIL impact radius for the project (75 m), it's unlikely that PM10 impacts from nearby sources would overlap with the project's impact areas. In addition, construction

is considered short term, and the impacts to the general population and sensitive populations during construction would be reduced with the implementation of **AQ-SC1** through **AQ-SC5**. Therefore, a cumulative impacts analysis for PM10 during construction is not required.

The applicant performed a localized cumulative impacts modeling analysis for 1-hour and annual NO_2 and annual PM2.5 during project construction. Because construction of each geothermal projects evaluated (i.e. MBGP, ENGP, and BRGP) is not expected to overlap with operation of each other, only their construction emissions were included in the construction cumulative impact analysis (Jacobs 2023ii).

Table 5.1-14 shows the maximum modeled cumulative impacts associated with concurrent construction of MBGP, ENGP, and BRGP. **Table 5.1-14** shows that the cumulative impacts from concurrent construction of MBGP, ENGP, and BRGP would be below the limiting standards for PM2.5 and NO_2. Therefore, construction of each project would not expose sensitive receptors to substantial criteria pollutant concentrations, and therefore this impact would be less than significant.

TABLE 5.1-14 CUMULATIVE AIR QUALITY IMPACTS DURING CONSTRUCTION (µg/m^3)

Pollutant	Averaging Time	Cumulative Impact	Background	Total Impact	Limiting Standard	Percent of Standard
PM2.5 [a]	24-hour	1.4	24.5	25.9	35	74%
	Annual	0.3	9.4	9.7	12	81%
NO_2 [b]	State 1-hour	72.7	105.0	177.7	339	52%
	Federal 1-hour	69.0	70.6	139.6	188	74%
	Annual	11.6	14.9	26.5	57	46%

Notes:
[a] To compute the total impacts for the 24-hour PM2.5 NAAQS, staff conservatively combined the maximum modeled 24-hour PM2.5 impacts to the three-year average of 98th percentile PM2.5 background.
[b] NO_2 impacts are evaluated with ARM2 option in AERMOD, with U.S. EPA-default minimum/maximum NO_2/NOx ambient ratios of 0.5/0.9. The state 1-hour NO_2 total impacts include the maximum modeled project impact combined with maximum NO_2 background value. The federal 1-hour NO_2 total impacts include the modeled 5-year average of 98th percentile daily maximum 1-hour NO_2 project impact combined with 3-year average of 98th percentile daily maximum 1-hour background NO_2.
Sources: Jacobs 2023ii, Table 6-2 with modeling files, CEC staff analysis

Localized Cumulative Impacts during Operation

Table 5.1-12 shows that operation emissions from the project would result in maximum modeled impacts that exceed the SILs for 24-hour PM2.5 of 1.2 µg/m^3, annual PM2.5 of 0.2 µg/m^3, and 24-hour PM10 of 5 µg/m^3.

However, as discussed in detail in the operation impacts analysis under CEQA environmental checklist criterion "c" above, the area where the maximum modeled PM10

impacts exceed SILs is very small (within 30 m [98 feet] of the fence line). The maximum 24-hour PM10 impacts at the sensitive receptors would be below the U.S. EPA PM10 SIL. Due to the limited SIL impact radius for the project (30 m), it's unlikely that PM10 impacts from nearby sources would overlap with the project's impact areas. In addition, the project's PM10 emissions are expected to be less than the ICAPCD Rule 207 PM10 offset threshold of 137 pounds per day (lbs/day) and CEQA PM10 significance threshold of 150 lbs/day, as presented in **Table 5.1-9**. Furthermore, the project would implement Best Available Control Technology to reduce particulate matter emissions from cooling tower and to minimize emissions from diesel combustion by using a Tier 3-certified fire pump and Tier 4-certified emergency generators. Thus, the project would have a less-than-significant impact for PM10 and not require further analysis, including a cumulative impacts analysis.

The applicant performed a localized cumulative impacts modeling analysis for 24-hour PM2.5 and annual PM2.5 during project operation. In addition, per CEC staff request, the applicant also analyzed the cumulative 1-hour H_2S impacts during project operation. Because operation of each geothermal projects evaluated (i.e. MBGP, ENGP, and BRGP) is not expected to overlap with construction of each other, only their operational emissions were considered in the operational cumulative impacts analysis (Jacobs 2023ii).

Table 5.1-15 shows the maximum modeled cumulative impacts associated with concurrent operation of MBGP, ENGP, and BRGP. **Table 5.1-15** shows that the cumulative impacts from concurrent operation of MBGP, ENGP, and BRGP would be below the limiting standards for PM2.5 and H_2S. Therefore, operation of each project would not expose sensitive receptors to substantial criteria pollutant concentrations, and therefore this impact would be less than significant.

TABLE 5.1-15 CUMULATIVE AIR QUALITY IMPACTS DURING OPERATION (µg/m³)

Pollutant	Averaging Time	Cumulative Impact	Background	Total Impact	Limiting Standard	Percent of Standard
PM2.5 [a]	24-hour	4.4	24.5	28.9	35	83%
	Annual	0.4	9.4	9.8	12	82%
H_2S [b]	1-hour	37.5	--	37.5	42	89%

Notes:
[a] To compute the total impacts for the 24-hour PM2.5 NAAQS, staff conservatively combined the maximum modeled 24-hour PM2.5 impacts to the three-year average of 98th percentile PM2.5 background.
[b] The maximum modeled cumulative 1-hour H_2S impacts at any receptor in the modeling domain is shown here for a conservative analysis.
Sources: Jacobs 2023ii, Table 6-1 with modeling files, CEC staff analysis

5.1.3 Applicable LORS and Project Conformance

Table 5.1-16 shows staff's determination of conformance with applicable local, state and federal LORS, including any proposed Conditions of Certification (COCs), where applicable, to ensure the project would comply with LORS. As shown in this table, CEC

staff concludes that with implementation of specific COCs, the proposed project would be consistent with all applicable LORS. The subsection below, "Staff Proposed Conditions of Certification," contains the full text of the referenced COCs.

TABLE 5.1-16 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
Federal	
Clean Air Act	
40 Code of Federal Regulations (CFR) Part 51, Nonattainment NSR Program	**Yes.** New source review requirements are implemented through ICAPCD rules and regulations. Condition of Certification **AQ-SC6** would ensure ICAPCD permit conditions are satisfied.
State	
California Health and Safety Code	
Section 41700, Nuisance Provisions	**Yes.** Applies to all of the proposed project's emitting activities and sources. To avoid the potential for injury, detriment, nuisance, or annoyance this analysis includes COC **AQ-SC1** to **AQ-SC4** for minimizing visible dust during construction.
ICAPCD	
Rule 201, Permits Required	**Yes.** This analysis includes Condition of Certification **AQ-SC6** for stationary source permit conditions.
Rule 204, Applications	**Yes.** The project owner has satisfied this rule with the submittal of a complete permit application to the District for the proposed construction of the MBGP. The application was deemed complete by the Air District on June 22, 2023.
Rule 206, Processing of Applications	**Yes.** The project will exceed the emissions threshold in Section C.3 of 100 pounds per day for H_2S and thus will trigger public notice requirements of this rule.
Rule 207, New and Modified Stationary Source Review	**Yes.** The rule includes standards for the implementation of best available control technology (BACT) and emission offsets, as well as provisions for an air quality impact assessment. Because the MBGP involves the development of a power plant with a net generation capacity of 140 MW, it is subject to this rule.

5.1.4 Conclusions and Recommendations

As discussed above, with implementation of COCs, the project would have a less than significant impact related to air quality and would conform with applicable LORS. CEC staff recommends adopting the COCs as detailed in subsection "5.1.5 Proposed Conditions of Certification" below.

5.1.5 Proposed Conditions of Certification

The following proposed COCs include measures to both mitigate environmental impacts and ensure conformance with applicable LORS. The conditions below are enforceable as part of the CEC's certificate for the portions of the project constituting the site and related

facility as detailed in the Project Description. Additional impacts associated with project components outside of CECs jurisdiction, such as the well complex licensed by CalGEM, the temporary structures such as the laydown yard to be permitted by Imperial County, and the switching station to be permitted by IID, may require mitigation to be less than significant.

This CEQA analysis evaluates all impacts resulting from all aspects of the project, and for the entire project to have less than significant impacts, the mitigation actions described in these COCs would need to be implemented by the various licensing jurisdictions as mitigation measures (MMs) where appropriate. For purposes of the facility certification issued by CEC, the following COCs must be complied with by the applicant on the jurisdictional site and related facilities as delineated in **Section 3.1 Project Description**. Verifications set forth below only apply to the COCs, not the MMs.

Staff proposes the following COCs (identified as the **AQ-SCx** series of conditions) to provide measures to mitigate environmental impacts and ensure conformance with applicable LORS. Those COCs staff recommends be applied to the project components under the authority of other jurisdictions are labeled as MM.

AQ-SC1/MM AQ-SC1 Air Quality Construction Mitigation Manager (AQCMM): The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with Conditions of Certification AQ-SC3, AQ-SC4 and AQ-SC5 for the entire project site and linear facility construction. The on-site AQCMM may delegate responsibilities to one or more AQCMM Delegates. The AQCMM and AQCMM Delegates shall have full access to all areas of construction on the project site and linear facilities and shall have the authority to stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM and AQCMM Delegates may have other responsibilities in addition to those described in this condition. The AQCMM shall not be terminated without written consent of the Compliance Project Manager (CPM).

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall submit to the CPM for approval, the name, resume, qualifications, and contact information for the on-site AQCMM and all AQCMM Delegates.

AQ-SC2/MM AQ-SC2 Air Quality Construction Mitigation Plan (AQCMP): The project owner shall provide an AQCMP, for approval, which details the steps that will be taken and the reporting requirements necessary to ensure compliance with Conditions of Certification AQ-SC3, AQ-SC4, and AQ-SC5.

Verification: At least 30 days prior to the start of any ground disturbance, the project owner shall submit the AQCMP to the CPM for approval. The AQCMP shall include effectiveness and environmental data for the proposed soil stabilizer. The CPM will notify the project owner of any necessary modifications to the plan within 15 days from the date of receipt.

AQ-SC3/MM AQ-SC3 Construction Fugitive Dust Control: The AQCMM shall submit documentation to the CPM in each Monthly Compliance Report that demonstrates compliance with the Air Quality Construction Mitigation Plan (AQCMP) mitigation measures for the purposes of minimizing fugitive dust emission creation from construction activities and preventing all fugitive dust plumes that would not comply with the performance standards identified in AQ-SC4 from leaving the project site. Any deviation from the AQCMP mitigation measures shall require prior CPM notification and approval.

Report monthly on the following fugitive dust mitigation measures that shall be included in the Air Quality Construction Mitigation Plan (AQCMP) required by AQ-SC2:

1. The main access roads through the facility will be either paved or stabilized using soil binders, or equivalent methods, to provide a stabilized surface that is similar for the purposes of dust control to paving, that may or may not include a crushed rock (gravel or similar material with fines removed) top layer, prior to initiating construction, and delivery areas for operations materials (chemicals, replacement parts, etc.) will be paved or treated prior to taking initial deliveries.
2. All unpaved construction roads and unpaved operation and maintenance site roads, as they are being constructed, shall be stabilized with a non-toxic soil stabilizer or soil weighting agent that can be determined to be as efficient as or more efficient for fugitive dust control than CARB approved soil stabilizers, and that shall not increase any other environmental impacts, including loss of vegetation to areas beyond where the soil stabilizers are being applied for dust control. All other disturbed areas in the project and linear construction sites shall be watered as frequently as necessary during grading; and after active construction activities shall be stabilized with a non-toxic soil stabilizer or soil weighting agent, or alternative approved soil stabilizing methods, in order to comply with the dust mitigation objectives of Condition of Certification AQ-SC4. The frequency of watering can be reduced or eliminated during periods of precipitation.
3. No vehicle shall exceed 10 miles per hour on unpaved areas within the construction site, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.
4. Visible speed limit signs shall be posted at the construction site entrances.
5. All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.
6. Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.

7. All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.
8. All construction vehicles shall enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the CPM.
9. Construction areas adjacent to any paved roadway below the grade of the surrounding construction area or otherwise directly impacted by sediment from site drainage shall be provided with sandbags or other equivalently effective measures to prevent run-off to roadways, or other similar run-off control measures as specified in the Storm Water Pollution Prevention Plan (SWPPP), only when such SWPPP measures are necessary so that this condition does not conflict with the requirements of the SWPPP.
10. All paved roads within the construction site shall be swept daily or as needed (less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.
11. At least the first 500 feet of any paved public roadway exiting the construction site or exiting other unpaved roads en route from the construction site or construction staging areas shall be swept as needed (less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff resulting from the construction site activities is visible on the public paved roadways.
12. All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered or shall be treated with appropriate dust suppressant compounds.
13. All vehicles that are used to transport solid bulk material on public roadways and that have potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least two feet of freeboard.
14. Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

Verification: The AQCMM shall provide the CPM a Monthly Compliance Report to include the following to demonstrate control of fugitive dust emissions:

a. A summary of all actions taken to maintain compliance with this condition;
b. Copies of any complaints filed with the District in relation to project construction; and

c. Any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC4/MM AQ-SC4 Dust Plume Response Requirement: The AQCMM or an AQCMM Delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported (A) off the project site and within 400 feet upwind of any regularly occupied structures not owned by the project owner or (B) 200 feet beyond the centerline of the construction of linear facilities indicate that existing mitigation measures are not resulting in effective mitigation. The AQCMP shall include a section detailing the additional mitigation measures described in the verification below and how they will be implemented to meet these fugitive dust control performance standards.

The AQCMM or Delegate shall implement the following procedures for additional mitigation measures if visible dust plumes as defined above are observed:

Step 1: The AQCMM or Delegate shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

Step 2: The AQCMM or Delegate shall direct implementation of additional methods of dust suppression if Step 1, specified above, fails to result in adequate mitigation within 30 minutes of the original determination.

Step 3: The AQCMM or Delegate shall direct a temporary shutdown of the activity causing the emissions if Step 2, specified above, fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or Delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The project owner may appeal to the CPM any directive from the AQCMM or Delegate to shut down an activity, if the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM before that time.

Verification: The AQCMM shall provide the CPM a Monthly Compliance Report to include:

a. A summary of all actions taken to maintain compliance with this condition;

b. Copies of any complaints filed with the District in relation to project construction; and

c. Any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC5/MM AQ-SC5 Diesel-Fueled Engine Control: The AQCMM shall submit to the CPM, in the Monthly Compliance Report, a construction mitigation report that demonstrates compliance with the AQCMP mitigation measures for purposes of

controlling diesel construction-related emissions. Any deviation from the AQCMP mitigation measures shall require prior and CPM notification and approval.

The following off-road diesel construction equipment mitigation measures shall be included in the Air Quality Construction Mitigation Plan (AQCMP) required by AQ-SC2:

1. All diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCMM showing that the engine meets the conditions set forth herein.
2. All construction diesel engines with a rating of 25 hp or higher shall meet, at a minimum, the Tier 4 Final California Emission Standards for Off-Road Compression-Ignition Engines, as specified in California Code of Regulations, Title 13, section 2423(b)(1), unless a good faith effort to the satisfaction of the CPM that is certified by the on-site AQCMM demonstrates that such engine is not available for a particular item of equipment. In the event that a Tier 4 Final engine is not available for any off-road equipment larger than 50 hp, a Tier 4 Interim or Tier 3 engine shall be used or that equipment shall be equipped with retrofit controls to reduce exhaust emissions of nitrogen oxides (NOx) and diesel particulate matter (DPM) to no more than Tier 3 levels unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this condition, the use of such devices is "not practical" for the following, as well as other, reasons.
    i. There is no available retrofit control device that has been verified by either the California Air Resources Board or U.S. Environmental Protection Agency to control the engine in question or
    ii. The construction equipment is intended to be on site for 10 days or less; or
    iii. The CPM may grant relief from this requirement if the AQCMM can demonstrate a good faith effort to comply with this requirement and that compliance is not practical.
3. The use of a retrofit control device may be terminated immediately, provided that the CPM is informed within 10 working days of the termination and that a replacement for the equipment item in question meeting the controls required in item "b" occurs within 10 days of termination of the use, if the equipment would be needed to continue working at this site for more than 15 days after the use of the retrofit control device is terminated, if one of the following conditions exists:
    i. The use of the retrofit control device is excessively reducing the normal availability of the construction equipment due to increased down time for maintenance, and/or reduced power output due to an excessive increase in back pressure.
    ii. The retrofit control device is causing or is reasonably expected to cause engine damage.

iii. The retrofit control device is causing or is reasonably expected to cause a substantial risk to workers or the public.

iv. Any other seriously detrimental cause which has the approval of the CPM prior to implementation of the termination.

4. All heavy earth-moving equipment and heavy-duty construction-related trucks with engines meeting the requirements of (b) above shall be properly maintained and the engines tuned to the engine manufacturer's specifications.

5. All diesel heavy construction equipment shall not idle for more than five minutes. Vehicles that need to idle as part of their normal operation (such as concrete trucks) are exempted from this requirement.

6. Construction equipment will employ zero-emission or hybrid powertrains and electric motors when feasible.

Verification: The AQCMM shall include in the Monthly Compliance Report the following to demonstrate control of diesel construction-related emissions:

a. A summary of all actions taken to control diesel construction related emissions;

b. A list of all heavy equipment used on site during that month, including the owner of that equipment and a letter from each owner indicating that equipment has been properly maintained; and

c. Any other documentation deemed necessary by the CPM, and the AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC6 New Source Review Permits: The project owner shall provide the CPM copies of any APCD issued Authority to Construct (ATC) and Permit to Operate (PTO) for the facility. The project owner shall submit to the CPM for review and approval any modification proposed by the project owner to any project air permit. The project owner shall submit to the CPM any modification to any permit proposed by the APCD or U.S. Environmental Protection Agency (U.S. EPA), and any revised permit issued by the APCD or U.S. EPA, for the project.

Verification: The project owner shall submit any ATC, PTO, and proposed air permit modification to the CPM within 5 working days of its submittal either by 1) the project owner to an agency, or 2) receipt of proposed modifications from an agency. The project owner shall submit all modified air permits to the CPM within 15 days of receipt.

AQ-SC7 The project owner shall perform readiness testing and maintenance on only one (1) diesel-fired emergency generator or the diesel fire water pump in a single hour.

Verification: The project owner shall demonstrate compliance with this condition in the Quarterly Operational Reports.

AQ-SC8 The project owner shall submit to the CPM Quarterly Operation Reports, following the end of each calendar quarter, that include operational and emissions information as necessary to demonstrate compliance with the COCs herein. The Quarterly Operation Report shall specifically note or highlight incidences of noncompliance.

Verification: The project owner shall submit the Quarterly Operation Reports to the CPM no later than 30 days following the end of each calendar quarter.

District Preliminary Determination of Compliance Conditions (ICAPCD 2024c)

The following ICAPCD conditions apply to each unit of equipment, and the proposed facility as a whole.

General Conditions

AQ-1 The facility shall be constructed to operate in substantial compliance with the project description, and operating parameters of the Application dated April 24, 2023, and subsequent data submittals on June 12, 2023, October 4, 2023, November 10, 2023, and November 14, 2023, except as may be modified by more stringent requirements of law or these conditions.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-2 Operation of all equipment shall be in compliance with all data and specifications submitted with the Application under which this permit is issued unless otherwise noted.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-3 Operation of all equipment shall be in compliance with applicable ICAPCD Rules and Regulations.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-4 These conditions of certification do not authorize the emissions of air contaminants in excess of those allowed by the USEPA (Title 40 of the Code of Federal Regulation [CFR]), the State of California (Division 26, Part 4, Chapter 3 of the Health & Safety Code), or the ICAPCD (Rules and Regulations).

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-5 These conditions of certification cannot be considered permission to violate applicable existing laws, regulations, rules or statues of other governmental agencies.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-6 No air contaminant shall be released into the atmosphere which causes 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.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-7 All equipment shall be maintained in good operating conditions and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-8 Disturbances of soil related to any construction, demolition, excavation, or other earthmoving activities shall comply with the requirements for fugitive dust control stated in Air District Rule 801.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-9 The project owner shall prevent or cleanup any carry-out or track-out, as specified in Air District Rule 803.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-10 The project owner shall implement Best Available Control Measures (BACM) at any applicable open areas to control fugitive dust emissions, as specified in Air District Rule 804.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-11 Any unpaved and paved road, and open areas subject to be disturbed by vehicle traffic shall comply with the requirements of Air District Rule 805 for fugitive dust control.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-12 The project owner shall not release or discharge into the atmosphere any air contaminant for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann Chart 1 or 20% opacity.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-13 The project owner shall maintain all unpaved haul/access roads and parking areas within the facility with a dust suppression system consisting of gravel, crushed/recycled asphalt, water suppression, or other forms of physical stabilization.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-14 The emissions of any regulated pollutant, as defined pursuant to 40 CFR 70.2, shall be less than the major source threshold values listed in Air District Rule 900, Section B.23.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-15 The emissions of any single hazardous air pollutant, as defined pursuant to Section 112(b) of the 1990 Clean Air Act shall be less than 10 tons per year. Total combined emissions of all hazardous air pollutants, as defined pursuant to Section 112(b) of the 1990 Clean Air Act, shall be less than 25 tons per year.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

Facility Emissions and Operational Limits

AQ-16 The following facility-wide emissions limits shall not be exceeded by the project owner at the MBGP facility during routine power generation, when all abatement systems are operating.

Pollutant	Emission Limits (lb/hr)	Emission Limits (lb/day)
Hydrogen Sulfide (H_2S)	2.04	48.96

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-17 The following facility-wide emissions limits shall not be exceeded by the project owner at the MBGP during times in which the sparger abatement system is being bypassed or during breakdown, which is limited to a maximum of 200 hours per year.

Pollutant	Emission Limits (lb/hr)	Emission Limits (lb/day)
Hydrogen Sulfide (H_2S)	82.3	1,975.2

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-18 The following facility-wide emissions limits shall not be exceeded by the project owner at the MBGP during times in which the Ox-Box abatement system is being bypassed or during breakdown, which is limited to a maximum of 200 hours per year.

Pollutant	Emission Limits (lb/hr)	Emission Limits (lb/day)
Hydrogen Sulfide (H_2S)	55.6	1,334.4

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-19 The following facility-wide emissions limits shall not be exceeded by the project owner at the MBGP facility during commissioning.

Pollutant	Emission Limits (lb/hr)	Emission Limits (lb/day)
Hydrogen Sulfide (H_2S)	136	3,264

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-20 The following emissions limits shall not be exceeded by the project owner at the MBGP facility during well flow back conditions.

Pollutant	Per Well	Facility-Wide
	Emission Limits (lb/hr)	Emission Limits (lb/day)
Hydrogen Sulfide (H_2S)	9.95	238.8

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-21 The following emissions limits shall not be exceeded by the project owner at the MBGP facility during well testing.

Pollutant	Per Well	Facility-Wide
	Emission Limits (lb/hr)	Emission Limits (lb/day)
Hydrogen Sulfide (H_2S)	40.4	969.6

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-22 The following facility-wide emissions limits shall not be exceeded by the project owner at the MBGP facility during cold and warm startups, which are limited to a maximum of 200 hours per year and 400 hours per year, respectively.

Pollutant	Emission Limits (lb/hr)	Emission Limits (lb/day)
Hydrogen Sulfide (H_2S)	136	3,264

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-23 The following facility-wide emissions limits shall not be exceeded by the project owner at the MBGP facility during shutdown, which is limited to a maximum of 198 hours per year.

Pollutant	Emission Limits (lb/hr)	Emission Limits (lb/day)
Hydrogen Sulfide (H_2S)	154	3,696

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-24 The following facility-wide emissions and throughput limits shall not be exceeded by the project owner at the MBGP facility during HCl scrubber and tank operation.

Pollutant	Emission Limits (lb/hr)	Emission Limits (lb/day)	Throughput Limits (gal/yr)
Hydrogen Chloride (HCl)	0.11	2.75	52,560,000

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-25 The total facility-wide emissions, including maintenance/bypass of emissions control systems, startups, shutdowns, maintenance of geothermal wells and normal operations, shall not exceed the following annual rates:

a. Hydrogen sulfide emissions shall be limited to 183 tons in the first production year, which includes well testing and commissioning activities.

b. Hydrogen sulfide emissions shall be limited to 65.6 tons per year, for each subsequent year of production.

c. PM10 emissions shall be limited to 15.8 tons per year.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-26 The Ox-Box and sparger abatement systems shall follow the below operating conditions:

a. The project owner shall engage control equipment upon plant startup and shall utilize controls as long as practicable during periods of malfunction. Use of the controls will establish an affirmative defense to any excess emissions during startup, shutdown, and malfunction if the control equipment is maintained and operated in a manner consistent with good practice for minimizing emissions.

b. The project owner shall operate the Ox-Box and sparger abatement systems for hydrogen sulfide control to achieve compliance with the hydrogen sulfide emission limits.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-27 The project owner shall install, operate, and maintain the listed Ox-Box and sparger abatement system (utilizing the oxidizing biocide [BIOX] process) at all times the production wells are in use, except for the following:

a. When control equipment or upstream equipment maintenance requires bypassing either the Ox-Box system or sparger system, bypass of each abatement system will be limited to a maximum of 200 hours per year.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-28 The project owner shall limit the flow-back duration for new wells to twenty-four (24) hours per well and the well testing duration for new wells to 240 hours per well, with the permittee using best available control methods to minimize fugitive emissions and venting to the atmosphere.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

Cooling Tower

AQ-29 The MBGP cooling tower shall not exceed the following PM10 emissions limits.

Pollutant	Emission Limits (lb/hr)	Emission Limits (lb/day)
PM10	3.59	86.16

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-30 The water circulated in the MBGP cooling tower shall not exceed the following concentration limit for TDS.

Pollutant	Concentration Limits (ppmv)
TDS	9,000

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-31 The project owner shall control PM10 emissions by installing high efficiency drift eliminators that comply with the drift loss specs (0.0005%) claimed by the project owner.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-32 The project owner shall maintain the drift eliminators of the cooling tower in good working order at all times to perform in accordance with the manufacturer specifications.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-33 Testing of emissions from the Ox-Box system and sparger system will be conducted at the shrouds of the cooling tower during normal operation.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

Emergency Units

AQ-34 Each listed emergency generator shall be restricted to operate a total of fifty (50) hours per year for maintenance and testing purposes.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-35 The listed emergency fire pump shall be restricted to operate a total of fifty (50) hours per year for maintenance and testing purposes and to comply with the requirements of the National Fire Protection Association (NFPA) 25.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-36 Operation of the listed emergency generators for other than testing and maintenance purposes shall be limited to providing backup power, and in each instance, documented to the satisfaction of the ICAPCD.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-37 All internal combustion engines shall not discharge into the atmosphere any visible air contaminant, other than uncombined water vapor, for a period or periods

aggregating more than three minutes in any one hour, which is 20% opacity or greater.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-38 Each listed emergency unit shall be equipped with a non-resettable hour meter which must be kept in proper working condition at all times.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-39 The diesel engine of each listed emergency unit shall be fueled only with one or a combination of the following, (per Airborne Toxic Control Measure for Stationary Compression Ignition [CI] Engines § 93115.5 (a)):

a. CARB diesel fuel; or

b. an alternative diesel fuel, such as biodiesel or a biodiesel blend that does meet the definition of CARB diesel fuel; or

c. any alternative diesel fuel that meets the requirements of the Verification Procedure; or

d. CARB diesel fuel used with fuel additives that meets the requirements of the Verification Procedure.

Verification: The project owner shall submit to the CPM the diesel fuel purchase record as part of the Quarterly Operation Report (AQ-SC8) and make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-40 The project owner shall maintain an operation engine log onsite for each listed emergency unit. The project owner shall maintain all required records for a minimum of two (2) calendar years and make them available to the ICAPCD upon request. The log(s) shall include the following for each unit:

a. Engine manufacturer name, model number, brake horsepower output rating, and type of fuel combusted;

b. A manual of recommended maintenance as provided by the engine manufacturer or other maintenance procedure as approved in writing by the APCO;

c. Record of routine engine maintenance, including date(s) and type of maintenance performed;

d. A specific emission inspection procedure, with an inspection schedule, to ensure that the engine is operated in continual compliance with Air District Rule 400.3. Inspections shall be conducted every quarter or after every 2,000 hours of engine operation. In no event shall the frequency of inspections be less than once per year.

e. For each emergency unit, the total daily recorded hours of operation for maintenance and testing purposes.

f. For each emergency unit, the total daily recorded hours of operation for emergency events.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-41 The listed three emergency generators, with Kohler Engines Model KD83V16, shall be limited to the following emission limits:

a. 4.8 lbs/hr of NOx

b. 25.1 lb/hr of CO

c. 0.21 lb/hr of PM10.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-42 The project owner shall conduct an initial source test for each listed emergency generator to demonstrate compliance with the emission limits of Condition **AQ-41** within 60 days of start-up and once every 36 months thereafter. All emission rates shall be based on an hourly average, and the NOx emissions concentration shall be calculated as an average of three test runs.

Verification: The project owner shall submit to the CPM for review and the District for approval the initial source test protocol 30 days prior to all source tests. The project owner shall notify the CPM and District at least 7 days prior to the proposed source test date and time.

AQ-43 The frequency of compliance testing required per Condition **AQ-42** may be extended to not less than every 60 months per emergency generator, provided that the unit operated less than 500 hours per 12-month period (as demonstrated by operating logs) and which emitted less than 5 tons of NOx per 12-month period. This period may be extended if the project owner can prove that the unit(s) did not operate during the calendar year.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-44 The listed emergency generators shall each be source tested at no less than 80% of its total horsepower rating to determine compliance with the emission limits of Condition **AQ-41**. If the project owner demonstrates to the satisfaction to the APCO that a listed unit cannot operate at 80% capacity, then the source test shall be performed at the highest achievable continuous power rating. Compliance with

the NOx emission limits shall be determined by using CARB Method 100, ISO Method 8178, or US EPA Method 7E. Oxygen Content shall be determined by using CARB Method 100, ISO Method 8178, or US EPA Method 3A. Compliance with the CO emission limits shall be determined by using CARB Method 100, ISO Method 8178, or US EPA Method 10.

Verification: The project owner will submit all source test reports to the CPM for review and the District for approval within 60 days of the completion of those tests.

AQ-45 The source test protocol for each required test of Condition **AQ-42** shall be submitted to the ICAPCD for approval 30 days prior to commencing testing. Additionally, the project owner shall notify the ICAPCD at least seven (7) days prior to a scheduled source test with the exact date and time of the source test. The source test results shall be submitted to the ICAPCD within 60 days of the test being completed.

Verification: The project owner shall submit to the CPM for review and the District for approval the source test protocol 30 days prior to all source tests. The project owner shall notify the CPM and District at least 7 days prior to the proposed source test date and time. The project owner will submit all source test reports to the CPM for review and the District for approval within 60 days of the completion of those tests.

AQ-46 The project owner shall ensure that the ammonia slip emissions from the SCR systems abating the emergency generators do not exceed 5 ppmv, dry @ 15% O2. The APCO may request source testing by the project owner to demonstrate compliance with this emission limit.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-47 The project owner shall maintain all records for the listed emergency combustion units for a minimum of two (2) calendar years. These records shall be maintained with the unit or at the company's office and shall be made available to the District upon request.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

HCl Scrubber

AQ-48 The HCl storage tank shall be controlled by a scrubber with a minimum control efficiency of 99% for HCl emissions.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-49 The project owner shall conduct a source test of the HCl scrubber within ninety (90) days of startup of the power plant and every three years thereafter or sooner if requested by the APCO. The source test shall use EPA methods or ICAPCD-approved equivalent (for hydrogen chloride, ARB Method 421). Testing protocol(s) shall be submitted to the District for approval 30 days prior to source testing being conducted. Additionally, the project owner shall notify the ICAPCD at least seven (7) days prior to a scheduled source test with the exact date and time of the source test. The source test results shall be submitted to the ICAPCD within 60 days of the test being completed.

Verification: The project owner shall submit to the CPM for review and the District for approval the source test protocol 30 days prior to all source tests. The project owner shall notify the CPM and District at least 7 days prior to the proposed source test date and time. The project owner will submit all source test reports to the CPM for review and the District for approval within 60 days of the completion of those tests.

Monitoring Program

AQ-50 The project owner shall monitor the H_2S concentration (ppm) and mass flow rate (lb/hr) at the inlet of the Ox-Box on a weekly basis.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-51 The project owner shall monitor the H_2S concentration (ppm) and mass flow rate (lb/hr) at the inlet of the sparger abatement system at least once a week.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-52 The project owner shall measure the H_2S concentration (ppm) and mass flow rate (lb/hr) at the exhaust of each cooling tower shroud on a weekly basis. Each week, the outlet mass flow and the inlet mass flow (determined in Conditions **AQ-50** and **AQ-51**) will be used to calculate the overall abatement efficiency of the Ox-Box and sparger abatement systems.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-53 Prior to operations, the project owner shall submit to the APCO a compliance plan that meets the requirements of Section D of ICAPCD Rule 1003. This plan must be maintained onsite for at least two years and available to the Air District upon request.

Verification: The project owner shall submit to the CPM the compliance plan to demonstrate compliance with this condition within five working days of its submittal to the District.

AQ-54 The project owner shall inspect on a yearly basis the cooling tower drift eliminators to ensure that every cooling tower cell has the complete set of panels of drift eliminators, and replace those that are damaged. As a part of this annual inspection, the project owner shall conduct an inventory survey of the drift eliminators to ensure that the equipment is operating to specifications (i.e., maximum drift loss of 0.0005%).

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-55 The project owner, within 30 days of the end of each month, shall calculate the previous month's total H_2S emissions for the MBGP facility, and add it to the preceding eleven months to get a rolling twelve-month total. These calculations shall be maintained in a log and made available to the ICAPCD upon inspection to demonstrate compliance with the emissions limit set forth in Condition **AQ-25a** and **AQ-25b**. In addition, a third-party contractor shall conduct testing and analyze H_2S emissions for the MBGP facility at least once per year.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-56 The project owner, within 30 days of the end of each month, shall calculate the previous month's total PM10 emissions for the MBGP facility, based on methods in Condition **AQ-70** and add it to the preceding eleven months to get a twelve-month rolling total. These calculations shall be maintained in a log and made available to the ICAPCD upon inspection in order to demonstrate compliance with the emissions limits set forth in Condition **AQ-25c** and Condition **AQ-29**. In addition, a third-party contractor shall conduct testing and analyze PM10 emissions for the MBGP, according to the method in Condition **AQ-70**, at least once per year.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-57 In accordance with Condition **AQ-72**, the project owner shall conduct a cooling tower source test of the MBGP facility within ninety (90) days of start-up and every four years thereafter or sooner if requested by the APCO to ensure compliance.

Verification: The project owner shall submit to the CPM for review and the District for approval the cooling tower source test protocol 30 days prior to all source tests. The project owner shall notify the CPM and District at least seven days prior to the proposed source test date and time. The project owner will submit all source test reports to the CPM for review and the District for approval within 60 days of the completion of those tests.

AQ-58 For maintenance of the Ox-Box and sparger abatement systems and associated upstream equipment, the project owner shall maintain an up-to-date operational log, keeping records for a minimum of the three previous years, to track periods of maintenance for each system.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-59 The project owner shall maintain an up-to-date operating log of facility startup and load rejection events, keeping records for a minimum of the three previous years.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-60 The project owner shall maintain an up-to-date operating log of geothermal wells maintenance venting, keeping records for a minimum of the three previous years, to track periods of venting from maintenance of each of the facility's wells.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-61 The project owner shall analyze H_2S emissions using Tracer Enthalpy Test Procedures during well flow back to demonstrate compliance with Condition **AQ-20**.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-62 The project owner, when requested by the APCO, shall provide records, collect samples or gather other required information that will enable the APCO to determine compliance status (Rule 109). The ICAPCD may at any time elect to have itself or a third-party source test contractor or agency take samples and analyze for concentration and emission rates of any pollutant.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-63 All the source testing, sampling, analysis, and reporting cost shall be borne by the project owner.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

AQ-64 Upon proper notification, the ICAPCD or its designee shall have the right to enter to inspect and take samples from the emission sources at the MBGP facility.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the CEC.

Notification Requirements

AQ-65 Breakdowns:

a. The project owner shall notify the ICAPCD (per Rule 111) of any upset conditions or breakdown at the MBGP facility which causes a violation of emission limitations prescribed by ICAPCD Rules and Regulations, or by State law. The Air District shall be notified no later than two (2) hours after its detection. The completion of corrective measures or the shutdown of emitting equipment is required within 24 hours of occurrence of a breakdown condition, unless a Variance has been obtained. Venting due to plant startup, load rejection, or well testing is not considered a breakdown condition.

b. In the event of a breakdown, the project owner shall submit, within 10 days after a breakdown occurrence has been corrected, a written report to the APCO which includes: a) a statement that the occurrence has been corrected, b) the reason(s) or cause(s) of the occurrence, c) a description of the corrective measures undertaken, and d) the type of emission(s) and estimated quantity of each type of emissions caused by the occurrence.

Verification: The project owner shall notify the District and submit the report regarding any breakdowns as required in this condition and shall document all such occurrences in each Quarterly Operation Report (**AQ-SC8**).

AQ-66 Maintenance:

a. The project owner shall notify the ICAPCD at least 24 hours in advance before any scheduled maintenance is performed on the Ox-Box system, sparger system, or associated upstream equipment.

b. The project owner shall notify the ICAPCD within at least two hours after the start of any unscheduled maintenance of the Ox-Box system, sparger system, or associated upstream equipment.

c. The project owner shall notify the ICAPCD at least 24 hours in advance before any scheduled maintenance of geothermal wells.

d. The project owner shall notify the ICAPCD within at least two hours after the start of any unscheduled maintenance of geothermal wells.

e. The project owner shall notify the ICAPCD of any material physical change, change in method of operation, or addition to the facility that results in a net emission increase or decrease of any regulated pollutant.

Verification: The project owner shall notify the District regarding any maintenance as required in this condition and shall document all such occurrences in each Quarterly Operation Report (**AQ-SC8**).

Analyses

AQ-67 The project owner shall conduct a weekly analysis of the H_2S content in the condensate at the inlet of the Ox-Box in accordance with Condition **AQ-50**. Each laboratory analysis shall use USEPA approved methods or ICAPCD approved equivalents.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-68 The project owner shall conduct a weekly analysis of the H_2S content in the non-condensable gases at the inlet of the sparger abatement system in accordance with Condition **AQ-51**. Each laboratory analysis shall use USEPA approved methods or ICAPCD approved equivalents.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-69 The project owner shall conduct weekly analysis of the H_2S concentration (ppm) and mass flowrate (lb/hr) at the exhaust of each cooling tower shroud in accordance with Condition **AQ-52**. Laboratory analysis shall use USEPA approved methods or ICAPCD approved equivalents.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-70 The project owner shall conduct monthly testing of the recirculating water TDS levels for the cooling tower at MBGP to verify compliance with the cooling tower PM10 emission limit in Condition **AQ-29** and TDS limit in Condition **AQ-30**.

Verification: The project owner shall submit to the CPM operating data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-71 In accordance with **AQ-49**, the project owner shall conduct a source test of the MBGP facility within ninety (90) days of start-up and every three years thereafter or sooner if requested by the APCO to ensure compliance. The source testing shall be witnessed by APCD Staff, with all analytical results made available at the facility for inspection. The source test protocol shall be submitted for APCD approval 30 days prior to source testing being conducted, including testing described in Condition **AQ-49** above. Laboratory analysis shall use the EPA approved methods or an ICAPCD approved equivalent for the following:

a. Controlled emissions from the HCl scrubber for hydrogen chloride.

Verification: The project owner shall submit to the CPM for review and the District for approval the cooling tower source test protocol 30 days prior to all source tests. The project owner shall notify the CPM and District at least seven days prior to the proposed source test date and time. The project owner will submit all source test reports to the CPM for review and the District for approval within 60 days of the completion of those tests.

AQ-72 In accordance with Condition **AQ-57**, the project owner shall conduct a source test of the MBGP facility within ninety (90) days of start-up and every four years thereafter or sooner if requested by the APCO to ensure compliance. The source testing shall be witnessed by APCD Staff, with all analytical results made available at the facility for inspection. The source test protocol shall be submitted for APCD approval 30 days prior to source testing being conducted, including testing described in Condition F.8 above. Laboratory analysis shall use the EPA approved methods or an ICAPCD approved equivalent for the following:

a. Hot well condensate from the turbine condensers and cooling tower blow down for ammonia, arsenic, benzene, cadmium, chromium, copper, hydrogen sulfide, lead, manganese, mercury, nickel, radon, selenium, and zinc.

b. Of the non-condensable gases vented for: hydrogen sulfide, ammonia, arsenic, mercury, radon, benzene, toluene, and xylene.

Verification: The project owner shall submit to the CPM for review and the District for approval the cooling tower source test protocol 30 days prior to all source tests. The project owner shall notify the CPM and District at least seven days prior to the proposed source test date and time. The project owner will submit all source test reports to the CPM for review and the District for approval within 60 days of the completion of those tests.

Reports

AQ-73 The project owner shall submit to the ICAPCD a monthly report within 30 days of the preceding month that includes the following:

a. The combined Ox-Box and sparger abatement efficiency of H_2S, based on the analysis of:

1. The H_2S concentration in the condensate at the inlet of the Ox-Box in ppm and H_2S mass flow in lb/hr per Condition **AQ-67**;
2. The H_2S concentration in the non-condensable gases at the inlet of the sparger in ppm and H_2S mass flow in lb/hr per Condition **AQ-68**; and
3. The analysis of the H_2S concentration (ppm) and mass flow rate (lb/hr) at the exhaust of each cooling tower shroud per Condition **AQ-69**.

b. The overall H_2S removal efficiency by the air abatement systems, for the Ox-Box and sparger abatement systems combined (percent removal based on mass flow rate).

c. The monthly number of hours during which the sparger abatement system was bypassed or broken down, and the year-to-date total, to demonstrate compliance with Condition **AQ-17**.

d. The monthly number of hours during which the Ox-Box abatement system was bypassed or broken down, and the year-to-date total, to demonstrate compliance with Condition **AQ-18**.

e. The monthly number of hours for facility cold startups, and the year-to-date total, to demonstrate compliance with Condition **AQ-22**.

f. The monthly number of hours for facility warm startups, and the year-to-date total, to demonstrate compliance with Condition **AQ-22**.

g. The monthly number of facility shutdown hours, and the year-to-date total, to demonstrate compliance with Condition **AQ-23**.

h. The monthly throughput of hydrogen chloride through the HCl storage tank, and the year-to-date total, to demonstrate compliance with Condition **AQ-24**.

i. The monthly number of hours per well for flow back, to demonstrate compliance with Condition **AQ-28**.

j. The results of H_2S emissions analyses conducted during flow back in that month, to demonstrate compliance with Conditions **AQ-20**.

Verification: The project owner shall submit to the CPM the monthly report required by this condition as part of the Quarterly Operation Reports.

AQ-74 The project owner shall submit to the ICAPCD a report with the results of the cooling tower drift eliminators survey within sixty (60) days of the completion of the survey, in accordance with Condition **AQ-54** of this Permit.

Verification: The project owner shall submit to the CPM the report required by this condition within 7 days of submittal to the District.

AQ-75 The project owner shall submit to the ICAPCD a report containing the HCl scrubber source testing pursuant to Conditions **AQ-49** and **AQ-71**. The report shall be submitted 60 days after each source testing completion.

Verification: The project owner shall submit to the CPM the report required by this condition within 7 days of submittal to the District.

AQ-76 The project owner shall submit to the ICAPCD a report containing the cooling tower source testing pursuant to Conditions **AQ-57** and **AQ-72**. The report shall be submitted 60 days after each source testing completion.

Verification: The project owner shall submit to the CPM the report required by this condition within 7 days of submittal to the District.

AQ-77 The project owner shall submit to the ICAPCD an annual report by the end of February of each operating year. This report shall include the following items:

a. Total tons of H_2S emissions for the reporting year.

b. Types and quantities of cooling water additives.

c. Gross megawatts produced and net electrical megawatt-hours sold for the reporting year.

d. Results from each monthly test of the recirculating water total dissolved solids levels for the cooling tower, per Condition **AQ-70**.

e. The monthly fuel consumption, hours operated per month for maintenance and/or testing, and hours operated per month for emergency events for each listed emergency combustion unit.

f. The status of all active wells associated with the facility used for production or injection during the reporting year. For each well include the total days of rig activity (work over, clean out, or drilling) and the total hours of venting to the atmosphere (from test units).

g. The total annual number of hours during which the sparger abatement system was bypassed or broken down.

h. The total annual number of hours during which the Ox-Box abatement system was bypassed or broken down.

i. The total annual number of hours for facility cold startups.

j. The total annual number of hours for facility warm startups.

k. The total annual number of facility shutdown hours.

l. The total annual throughput of hydrogen chloride through the HCl storage tank.

Verification: The project owner shall submit to the CPM the annual report required by this condition within seven days of submittal to the District.

District Preliminary Determination of Compliance Equipment/Source List (ICAPCD 2024c)

Geothermal Power Plant

(1) (1) Morton Bay Geothermal Power Plant, with a capacity of approximately 157 MW gross (approximately 140 MW net).

Emergency Combustion Units

(1) Fire Pump, driven by a Clarke Model JU6H-UFADP0 diesel engine, with a rating of 316 bhp or equivalent as approved by the APCO.

(3) Standby Power Generators, 3,250 kW, driven by a Kohler Model KD83V16 diesel engine, with a rating of 4,680 bhp or equivalent as approved by the APCO.

Abatement Equipment

(1) Biological Oxidizer Box (Ox-Box), including a trickle block, splash fill, or equivalent packaging.

(1) Sparger Abatement System, utilizing oxidizing biocide (BIOX), consisting of distribution pipes with bubble diffusers/nozzles in the cooling tower for the abatement of hydrogen sulfide emissions in the non-condensable gases.

(1) Hydrochloric acid (HCl) scrubber.

Cooling Tower

(1) Cooling Tower. Model TBD, consisting of fourteen cells, equipped with high-efficiency drift eliminators (0.0005%).

Hydrogen Chloride Dosing System

(1) 20,000-gallon HCl storage tank and dosing system.

Geothermal Wells

(9) Production Wells, named as follows: MB-08, MB-07, MB-06, MB-05, MB-04, MB-03, MB-02, MB-01, and MB-09.

(8) Injection Wells (Brine), named as follows: MBI-21, MBI-22, MBI-23, MBI-24, MBI- 25, MBI-26, MBI-27, and MBI-28.

(2) Injection Wells (Condensate), named as follows: MBC-101, MBC-103.

(1) Injection Well (Aerated Fluid), named MBA-102.

5.1.6 References

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5.2 Biological Resources

Leane Dunn, Chris Huntley

This section of the staff assessment describes the biological resources present or with the potential to occur in or near the proposed Morton Bay Geothermal Project (MBGP). The term "project" refers to the whole of the project, including elements of the proposed project that fall under the CEC license and those elements of the proposed project requiring permitting by local or other jurisdiction. Specific components of the project that fall under the CEC license are referred to by name (i.e., generating facility). In addition, this section presents the regulatory background, discusses impacts associated with the construction and operation of the proposed project, and identifies mitigation and conditions of certification to reduce impacts to sensitive biological resources.

The information presented in this section is based on information described in technical studies and surveys conducted by the applicant, California Energy Commission (CEC) staff's independent review of existing literature and reports, and coordination with staff from regulatory agencies (see Appendix A at the end of this section). In addition, CEC staff conducted a one-day reconnaissance level site visit to gain an overview of the site. CEC staff's independent review, analysis, and recommendations follow.

5.2.1 Environmental Setting

Regional and Local Setting

The proposed project is in the Salton Sink (Sink) area of the Salton Trough (Patten 2008) in Imperial County, California, within the broader Colorado Desert (IID 2023). The Colorado Desert is a desert of much lower elevation than the Mojave Desert to the north, and much of the land lies below 1,000 feet above mean sea level (AMSL). Mountain peaks rarely exceed 3,000 feet AMSL. Common habitat in this region includes sandy desert, scrub, palm oasis, and desert wash. Summers are hot and dry, and winters are cool and moist. The Sink area is below sea level (IID 2023) and generally consists of alluvial fans and bajadas that border the Salton Sea. The Salton Sea is the lowest point in the valley, at a current elevation of approximately 227 feet below mean sea level (BMSL).

Agricultural lands are common in the region and small communities such as Niland, Calapatria, Westmorland, and Brawley are present. Agricultural lands extend from the southern end of the Salton Sea south to the Mexican border. Several highways intersect the area, including Highways 78, 86, 111, 115. Interstate 8 bisects the agricultural area further south between El Centro and Herber.

The Sink is bordered to the east and west by substantial mountain ranges. The Chocolate Mountains are to the east and northeast and reach elevations exceeding 2,000 feet AMSL. The Santa Rosa Mountains are located to the west and northwest with peaks up to 4,500 feet AMSL. Rain falling on the interior slopes of the surrounding mountain ranges flows to the Salton Sea, where it is supplemented by irrigation water (TN249723).

On a local scale, the project site would be on approximately 51 acres of a 160-acre parcel within the unincorporated areas of Imperial County at the southern end of the Salton Sea. The surrounding area consists of actively farmed fields and geothermal plants. The existing Hudson Ranch Power I Power Station is located approximately 0.25 miles east of the proposed generating facility. The Sonny Bono Salton Sea National Wildlife Refuge (NWR) Headquarters is approximately 2.25 miles southwest, and the Alamo River is located approximately 0.20 mile southwest, of the plant location. At its closest point, one of the project's production wells are adjacent to the Alamo River along Red Hill Road, and the gen-tie lines cross over the Alamo River at Garst Road.

The proposed project would include nine production wells installed on six new well pads, 11 injection wells installed on five injection well pads, one future expansion injection well pad, auxiliary features such as borrow pits and staging areas, and a generation interconnect (gen-tie) line. Production and injection wells would be connected to the geothermal facility by aboveground pipelines supported on metal pedestals in concrete foundations. The gen-tie line would connect the site to a new switching station and existing electrical infrastructure.

A concise description of the project and each of the proposed elements that fall under the CEC license is described below.

- **Generating Facility.** The proposed generating facility site is bounded by McDonald Road on the north, Davis Road on the east, W Schrimpf Road on the south, and an unnamed access road on the west. The site consists of bare ground with iodine bush (*Allenrolfea occidentalis*), berms, pooled water in depressions, and piles of dead trees and brush. Remnants of old Typha pools and gastropod shells were observed at the plant location. Vegetation communities on-site identified by the applicant include disturbed with vegetation (majority of the site), developed (access roads adjacent to the site and that traverse the site), iodine bush scrub (southwest corner), canals and drains (irrigation canals parallel to roads), and Tamarisk thickets (parallel to W Schrimpf Road).
- **Class II Surface Water Impoundment (Brine Ponds), Service Water Pond, Storm Water Retention Basin.** The Class II Surface Water Impoundment (brine pond) is a triple lined large concrete-surfaced "U" shaped basin that is sized to accommodate spent geothermal fluid; solids that have either precipitated or settled out of the geothermal fluid during the power generation process; fluids generated during emergency situations, maintenance operations, and water from hydro blasting, safety showers and eye wash stations, vehicle wash station effluent, water from the plant conveyance system and reject water from reverse osmosis; and fluid from production wells during flow-testing. The service water pond would be a lined earthen structure that would hold water for facility service water needs, including cooling tower makeup, dilution water, fire water, maintenance uses, and RO potable water system. The storm water retention pond would be a lined earthen structure that would contain storm water from the largest anticipated storm event. The brine pond, service water pond, and storm water retention pond would be within the generating facility,

and the entire geothermal facility would be fenced off. Vegetation and land cover is the same as those described under the MBGP generating facility location.

- **Water Supply Pipelines.** Water supply pipelines would extend off the generating facility, go north parallel to Davis Road and then east parallel to Hazard Road bordering the northernmost borrow pit. A buried pipeline would be installed to transfer water either by gravity or via transfer pump system from the custody transfer point to the service water pond. The pipe orientation mainly overlaps disturbed with vegetation (generating facility location, roads and areas adjacent to roads) and disturbed with no vegetation (northernmost borrow pit site). The water pipes would also cross canals and drains and a small silver of barren land at the southeast intersection of Davis Road and McDonald Road.
- **Gen-Tie Line.** Electricity generated by the generating facility would be delivered to an onsite substation near the northeast corner of the generating facility site; and this onsite substation would deliver energy through a one-half mile long generation interconnection (gen-tie) transmission line into the Imperial Irrigation District (IID) transmission system at a new switching station (the first point of interconnection) near and northwest of the intersection of Garst Road and West Sinclair Road. The gen-tie lines would extend south along the western side of the plant site, west along W Shcrimpf Road to the intersection of Red Hill Road, cross south over the Alamo River to Garst Road, and then continue south before connecting to the switching station at the Elmore North Geothermal project site.
- **Thermal Fluid Conveyance Pipeline.** The conveyance pipeline(s) extending from the MBGP site to the first well pad.

A concise description of the elements of the proposed project requiring permitting by local or other jurisdiction and not within the CEC certificate.

- **Production Wells, Well Pads, and System Pipelines.** These areas are adjacent to the plant site, and north of McDonald Road and south of Hazard Road. Vegetation and land cover types identified by the applicant include disturbed with vegetation and developed (adjacent to plant site), disturbed with no vegetation (north of McDonald Road), canals and drains (irrigation canals parallel to roads), and disturbed with vegetation (roads and areas adjacent to roads). Habitat consists of dry, bare ground with no vegetation and inundated areas. Patches of inundated areas occur between McDonald Road and Hazard Road, just east of Morton Bay, which consist of patches of cattails and common reed interspersed with water and bare ground. Wetlands and other aquatic features were identified at these areas. A large irrigation canal on the north side of Hazard Road (P Drain) was overgrown with common reed.
- **Injection Wells, Well Pads, and System Pipelines.** These areas are along W Schrimpf Road, and south of W Schrimpf Road and north of Brand Rd/Simpson Road. Vegetation and land cover types identified by the applicant include cattail marsh (between W Shcrimpf Road and Simpson Road), canals and drains (irrigation canals parallel to roads), disturbed with vegetation (roads and areas adjacent to roads), barren lands (north of W Schrimpf Road and south of the existing mud pots), iodine

bush scrub (also north of W Shcrimpf Road), and developed (existing infrastructure north of W Schrimpf Road). Wetlands and other aquatic features were identified at the well pad locations south of Schrimpf Road. Habitat consists of dry, bare ground, though scattered iodine bush was visible throughout the site. A dirt drainage irrigation canal inundated with water and ruderal vegetation occurs between W Schrimpf Road and the bare site. South of the area, on the south side of W Schrimpf Road, a large canal heavily overgrown with common reed runs parallel to the road. A berm occurs between W Schrimpf Road and the large canal with scattered iodine bush. On the south side of W Schrimpf Road, outside the project area, is the location of CDFW Imperial Wildlife Area Hazard Unit. This area is inundated with patches of cattails scattered throughout the water.

An additional injection well pad for future expansion occurs along Red Hill Road bordered by Morton Bay on the northeast and Alamo River on the southwest. Vegetation and land cover types identified by the applicant include Tamarisk thickets and cattail marsh (along Red Hill Road).

- **Construction Laydown and Parking Areas.** There are nine proposed construction laydown and parking areas for the generating facility. These sites are located across the general project area, from Morton Bay in the north to Obsidian Butte in the south. Vegetation and land cover types identified by the applicant include agriculture (a majority of the locations), disturbed with vegetation (access roads, areas adjacent to roads, berms between agricultural fields, and disturbed areas not used for agriculture), canals and drains (irrigation ditches parallel to roads), developed (area associated with the existing Vulcan Power Plant and existing pipelines), disturbed with vegetation (plant location), tamarisk thickets (vegetation along the large irrigation canal along Severe Road and other canals), and iodine bush scrub (section along Schrimpf Road near Morton Bay). Known mud pots are located east of Davis Road, outside the project area.

In some areas, the sites are adjacent to sensitive habitats including areas that could support special status species. One area at the western end of McKendry Road, where a parking area for the NWR is for lands adjacent to the Salton Sea, northwest, west and southwest (outside) of the site. An area of inundation occurs west of the parking lot with low growing iodine bush. The NWR to the northwest was inundated and heavily overgrown with common reed, scattered cattails (*Typha* sp.), and iodine bush. Obsidian Butte is to the southwest. A dirt drainage canal occurs along the north side of McKendry Road along the existing agricultural field.

North of McDonald Road there is a large irrigation canal overgrown with cattails and common reed. Patches of inundated areas occur between McDonald Road and Hazard Road, just east of Morton Bay, which also consist of patches of cattails and common reed interspersed with water and bare ground. The CDFW Imperial Wildlife Area Hazard Unit occurs between W Schrimpf Road south to Cox Road, which is outside, but adjacent to, Construction Laydown and Parking Areas. NWR owned land occurs between W Sinclair

Road south to McKendry Road, also outside but adjacent to a Construction Laydown and Parking Area.

- **Construction Camps.** There are two construction camps proposed for the proposed project, both on the west side of Cox Road. These areas would be used for worker housing if developed and are in areas supporting active agriculture. Vegetation and land cover types identified by the applicant include agriculture (majority of the site), disturbed with vegetation (roads and areas adjacent to roads) and canals and drains (various concrete canals and drains).
- **Borrow Pits.** There are four proposed borrow pits that would be used to support construction of the project. Most of the borrow pit sites are on agricultural lands or disturbed ground (with or without vegetation). Additional vegetation land cover types identified by the applicant include canals and drains and cattail marsh (within the irrigation canal along Hazard Road). One site at Brandt Road contains scattered iodine bush, one saltcedar tree (*Tamarix* sp.), and stacks of hay bales. The northeastern corner of the site was highly disturbed, with evidence of tire tracks and broken up cement. A dirt lined canal that was inundated during the survey runs along the south side of W. Sinclair Road. Hatfield Road the southern third of the site consists of dry, bare ground, whereas the northern two-thirds of the site consists of wet, bare ground. A small area of inundation of the soil was observed in a shallow depression along the western side.
- **Switching Station.** A new proposed 230kV switching station, the first point of interconnection, would be constructed as part of the IID system upgrades, approximately 2.3 miles from MBGP near and northwest of the intersection of Garst Road and West Sinclair Road. The applicant will engineer, construct, own, operate, and maintain the gen-tie line between the proposed MBGP generator step-up transformer and the switching station.

Biological Surveys

CEC staff conducted a reconnaissance-level biological survey on November 9, 2023. The applicant's biologists and botanist conducted the following biological resource surveys within the project area (TN249723, TN254834):

- February 28-March 3, 2022: Aquatic resource delineation and reconnaissance-level wildlife survey, burrowing owl habitat assessment and occupancy determination
- March 4, 2022: Protocol-level botanical surveys
- March 4-13 & 15, 2022: Burrowing owl habitat assessment and occupancy determination
- March 5-12, 2022: Protocol-level botanical surveys, reconnaissance-level wildlife surveys
- March 13, 2022: Aquatic resource delineation; reconnaissance-level wildlife survey
- March 15, 2022: Aquatic resource delineation; reconnaissance-level wildlife survey

- March 19, 2022: Protocol-level botanical surveys
- May 6-31, 2022: Protocol-level Yuma Ridgway's rail and California black rail surveys
- June 5-8, 2023: Burrowing owl breeding season impact assessment
- July 10-12, 2023: Burrowing owl breeding season impact assessment
- August 14-16, 2023: Burrowing owl breeding season impact assessment
- November 4, 2022: Reconnaissance-level biological survey, burrowing owl habitat assessment and occupancy determination
- November 6-7, 2023: Burrowing owl non-breeding season impact assessment

All biological surveys conducted by the applicant and CEC staff are collectively referred to as "biological surveys." Protocol-level botanicals surveys conducted by the applicant throughout the month of March are collectively referred to as "botanical surveys." Survey methodology is described in greater detail in Section 5.2.2.1, Methodology.

Literature and Database Review

Information on existing biological conditions was derived from data provided by the applicant, review of relevant local literature, database searches, and coordination with local biological resources experts and biologists from the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW).

Agency Communication

The following consists of agency communications provided by the applicant (TN250679).

- USFWS: Vincent James, USFWS Division Supervisor, was the Point of Contact (POC) for the geothermal sites regarding federally listed species. Felicia Sirchia, USFWS Palm Springs, is the desert pupfish specialist. Morgan King, USFWS is the assigned biologist to the project. Stephanie Menjivar, USFWS, Kent Kowalski, USFWS, were present during some of the meetings. Agencies requested desert pupfish analysis include more permanent effects to drains and canals. Agencies requested copy of the rail survey report, discussed habitat areas, and mentioned that Yuma Ridgway rails disperse at night and collide with fences and transmission lines. May and June 2023. Additional email communication occurred from June 2023 through
- Magdalena Rodriguez, CDFW, provided survey recommendations for burrowing owls, and stated active agricultural lands are not suitable burrowing owl locations except for features such as concrete structures or pipes. Rose Banks, CDFW, Maria Davydova-Flores, CDFW, Charley Land, CDFW, and Brett Daniels, CDFW were present during meetings. Agencies requested desert pupfish analysis include more permanent effects to drains and canals. Agencies requested copy of the rail survey report, discussed habitat areas, and mentioned that Yuma Ridgway rails disperse at night and collide with fences and transmission lines. June 2023.
- Communication with CDFW supported a survey protocol deviation from the 2012 CDFG burrowing owl survey guidelines. June 2023.

- CDFW and USFWS confirmed that desert pupfish surveys are not required because presence of desert pupfish in the area is presumed. Felicia Sirchia, USFWS, also provided a kmz of 2020 desert pupfish occupied canals and drains. Maria Davydova-Flores, CDFW, provided additional 2022 desert pupfish occurrence data, 2023 confirmed desert pupfish at Red Hill Bay Drains (in the vicinity of Elmore North well pads). Sharon Keeney, CDFW, stated that a survey in the end of May 2023 yielded over 400 desert pupfish, mostly juveniles, in the main connector channel of the Red Hill Bay Drains. May/June 2023.
- Charles (Charley) Land, CDFW Salton Sea Program, regarding state listed species.
- Kyle Dahl, U.S. Army Corps of Engineers (USACE), regarding Section 404 and Section 7 Consultation.
- Zakary Owens, Reginal Water Quality Control Board (RWQCB) Colorado River Basin, regarding waters of the state.

Staff also coordinated with the following agency staff to discuss emergent wetlands that support listed species, impacts to desert pupfish and Yuma Ridgway's rail, jurisdictionally of aquatic resource features, and agency mitigation measures:

- CDFW: Magdalena Rodriguez and Rose Banks
- USFWS: Felicia Sirchia, Kent Kowalski, and Stephanie Menjivar

Vegetation Communities and Other Land Cover Types

The applicants Application for Certification (AFC) Volume 1 (TN249723, Section 5.2 Biological Resources), Land Cover and Vegetation Types Figure DRR 25 (TN252552) and Community Mapping based on *A Manual of California Vegetation, Second Edition* (Sawyer et. al 2009; TN252491-01) describe the Land Cover and Vegetation Types in the project area. These land cover types were verified during the site visit conducted by CEC staff and are described below.

Agriculture: The predominant land cover within the project area is agriculture. The crops grown in these fields observed during the botanical surveys include alfalfa (*Medicago sativa*), beets (*Beta sp.*), Bermuda grass, corn (*Zea mays*), cultivated oats (*Avena sativa*), romaine lettuce (*Lactuca sativa*), and wheat (*Triticum aestivum*). Some fields were fallow or in between crop rotation. These lands provide foraging habitat for overwintering migratory birds and resident waterfowl. The agricultural land cover type includes an area of planted palm trees observed in the project buffer. Additional trees observed along the perimeter of agricultural fields include Guamúchil tree (*Pithecellobium dulce*) and salt cedar (*Tamarix* sp.). This land cover occurs at most of the construction laydown and parking areas, at the construction camps, and at one of the borrow pit locations.

Barren Lands: Barren lands are characterized as barren areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits, and other accumulation of earthen material. Generally, vegetation accounts for less than 15 percent of total cover. Barren lands appears to be extensively utilized

and maintained barren by agricultural practices including staging, storage, processing, and parking. The barren lands land cover type is only present on the northeast intersection Schrimpf Road and Davis Road, south of the mud pots.

Canals and Drains: Canals and drains are a nonnatural land cover type that includes concrete-lined and unlined drains located along north-south and east-west oriented roads and in between agricultural fields. Generally, drains are less than 20 feet in width and have steep earthen or concrete-lined banks. The drains within the project area support sparse vegetation consisting of southern cattail (*Typha domingensis*), giant reed (*Arundo donax*), and salt cedar (*Tamarix aphylla*). Periodic maintenance, including removal of vegetation, may limit the presence of special-status plant species. Wildlife may forage in these locations and some of these areas could support sensitive wildlife when flow is present. Burrowing owls are known to use holes in drains and under portions of the concrete canals. Irrigation infrastructure, including canals and drains, would not be directly impacted by the proposed project.

Developed: The developed land cover type is a nonnatural land cover type with manmade structures. Within the project site, these areas generally consist of energy production facilities and associated infrastructure. The areas lack typically natural vegetation cover. Some buildings and structures provide suitable roosting or nesting habitat for common bat and bird species.

Disturbed with Vegetation: The disturbed with vegetation land cover type is not a natural land cover type and is characterized by some form and intensity of human disturbance. The amount and type of vegetation present is dependent on such things as level of soil compaction and duration since last disturbance; species typically found here are generally ruderal such as Bermuda grass (*Cynodon dactylon*) and Russian thistle (*Salsola sp.*). This category also includes previously disturbed wetlands now with dead vegetation. In particular, this was most apparent during the CEC site visit in the area west of Davis Road between McDonald Road and W. Schimpf Road, where remnants of old Typha pools and gastropod shells were observed. This land cover type includes some areas at generating facility location, borrow pit locations, at or adjacent to injection wells, at one of the injection wells, and at areas adjacent to existing roads. The disturbed with vegetation land cover provides poor-quality wildlife habitat because of the level of human disturbance, sparse vegetation, and compacted soil. Wildlife species may still walk or fly over this land cover type as they move between higher-quality habitats. Bermuda grass and Russian thistle are considered invasive species by the California Invasive Plant Council (Cal-IPC 2024a).

Disturbed with No Vegetation: The disturbed with no vegetation land cover type is not a natural land cover type. These areas consist of unpaved north-south and east-west oriented roads, and other cleared areas adjacent to agricultural fields and roadways typically used for equipment and material staging, parking, and deliveries in support of agricultural activities on the project site. Wildlife use of disturbed areas would be transient only, however sensitive species could use areas immediately adjacent to these areas.

Tamarisk Thickets/Invasive Southwest Riparian Woodland and Shrubland: Invasive Southwest Riparian Woodland and Shrubland corresponds to *Tamarix* spp. Shrubland Semi-Natural Alliance (Tamarisk thickets) in the A Manual of California Vegetation, Second Edition (MCV) (Sawyer et. al 2009). Semi-Natural stands do not have a Global or State rank. Tamarisk or salt cedar is dominant in the open to continuous shrub canopy of this seminatural vegetation community. Emergent trees, such as willows (*Salix* sp.) or cottonwood (*Populus fremontii*), may be present at low cover. Other associated species include giant reed (*Arundo donax*), common reed (*Phragmites australis*), and arrowweed (*Pluchea sericea*). Salt cedar and giant reed are considered invasive species by the California Invasive Plant Council (Cal-IPC 2024a). Tamarisk thickets form in temporarily flooded areas along rivers, streams, or in depressions. This community is found at the injection well pad for future expansion along Red Hill Road, within inundated areas adjacent to roads (W Schrimpf Road, Garst Road, Cox Road, Boyle Road, and Severe Road), at the construction laydown and parking area associated with the proposed Elmore North generating facility site, and a small patch near the construction laydown and parking area between Severe Road and Boyle Road. This vegetation community provides cover, foraging, and nesting for wildlife species.

Typha Herbaceous Alliance (Cattail Marsh)/North American Arid West Emergent Marsh: North American Arid West Emergent Marsh corresponds to Typha (*angustifolia*, *domingensis*, *latifolia*) Herbaceous Alliance (cattail marsh) in the MCV (Sawyer et. al 2009). This Alliance is ranked G5/S5 (demonstrably secure). In this vegetation community, cattails (*T. angustifolia*, *T. domingensis* or *T. latifolia*) are dominant or co-dominant in the herbaceous layer, which is intermittent to continuous in cover. Other herbaceous vegetation includes bulrush (*Schoenoplectus* spp.) and common reed (*Phragmites australis*). Emergent trees, such as willows (*Salix* sp.), may be present at lower densities. North American Arid West Emergent Marshes are frequently or continually inundated with water and have saturated soils. This community is found in semi-permanently flooded freshwater or brackish areas, such as along slow-moving streams and rivers, sloughs, and ponds, with clayey or silty soils; or in intermittently flooded managed wetlands. Managed wetlands may be used for bird habitat or hunting and are found on private and public property. This community type is present at the injection well sites between W Shrimpf Road and Brandt Road, along Garst Road near the gen-tie lines, at the northernmost borrow pit site, and the injection well pad for future expansion along Red Hill Road at the Morton Bay. A variety of wildlife has potential to use this habitat for foraging and nesting. This vegetation type also is observed in intermittently flooded managed wetlands. Managed wetlands may be used for bird habitat or hunting and are found on private and public property.

Iodine Bush Scrub/North American Warm Desert Playa: North American Warm Desert Playa North American Warm Desert Playa corresponds to the *Allenrolfea occidentalis* Shrubland Alliance (iodine bush scrub) in the MCV (Sawyer et. al 2009). This Alliance is ranked G4/S3 and is considered sensitive by CDFW. Iodine bush (*Allenrolfea occidentalis*) is the dominant or co-dominant in this vegetation community, which is found on intermittently flooded alkaline or saline playas and hummocks. Vegetation is typically

sparse with less than 10 percent cover and highly alkaline or saline soils, though one area on the north side of N Lateral Road at the proposed plant site is approximately 15-25 percent vegetation cover, based on Google Earth® aerial photos. This vegetation community is also found at one of the injection well pads and associated pipelines. These areas provide poor wildlife nesting habitat but could provide foraging habitat when flooded. Varying levels of disturbance were noted within iodine bush scrub. Areas that were highly disturbed were nearly devoid of vegetation but were classified as such due to the alkaline soils and other indicators of a playa habitat.

Desert Holly Scrub/North American Warm Desert Volcanic Rockland: North American Warm Desert Volcanic Rockland is a natural vegetation type restricted to barren and volcanic substrates such as basalt lava and tuff. Vegetation is sparse and includes desert holly (*Atriplex hymenelytra*) and iodine bush. This community corresponds to the *Atriplex hymenelytra* Shrubland Alliance (Desert holly scrub) in the MCV (Sawyer et. al 2009) and is ranked G5/S4. Some of these outcrops have been mined. Birds may nest or perch on these outcrops. Use of these outcrops by other wildlife is expected to be transient because of sparse vegetation. North American Warm Desert Volcanic Rockland community type is only present in the buffer areas around the project.

Open Water: Open water has less than 25 percent cover of vegetation or soil. Open water is associated with the Salton Sea, associated inlets, and adjacent areas within the National Wildlife Refuge. Waterfowl and aquatic species use open water resources. Open water land cover type is only present in the buffer areas around the project.

Noxious or Invasive Weeds

Noxious or invasive weeds are plants that can directly or indirectly cause problems for agriculture, natural resources, wildlife, recreation, navigation, public health, or the environment (CDFA 2024). Noxious and other invasive plants are non-native plant species to California that can cause significant damage to natural landscapes, special-status plants, special-status wildlife, and other resources. The California Department of Food and Agriculture (CDFA) (CDFA 2024) and the California Invasive Plant Council (Cal-IPC) (Cal-IPC 2024b) have rated invasive or noxious weeds in California based on the threat these species pose to the natural landscape. Invasive plant species identified during biological surveys conducted by the applicant include: salt cedar, Bermuda grass, giant reed, golden wattle (*Acacia pycnantha*), Sahara mustard (*Brassica tournefortii*), field bindweed (*Convolvulus arvensis*), Kentucky bluegrass (*Poa pratensis*), London rocket (*Sisymbrium irio*), rabbitfoot grass (*Polypogon monspeliensis*), Russian thistle (*Salsola tragus*), Mediterranean grass (*Schismus* sp.), and puncturevine (*Tribulus terrestris*) (TN249723). Invasive salt cedar and sesbania (*Sesbania exalta*), which thrive in the moist soil of wetlands, are actively managed by the Refuge to control growth (USFWS 2024b). Many of the other invasive species are common to the area and are often associated with agricultural and other disturbed land use.

Invasive Wildlife

Many invasive wildlife species can displace native animal populations and can spread quickly from their point of introduction. Invasive wildlife can also cause harm to the environment, economy, or human health. Often a single individual may produce masses of larvae that quickly spread through an ecosystem. Invasive wildlife that live in or near the water can be easily dispersed to distant water bodies by river flows, streams, floods, and aqueducts. Further, these species typically do not have any natural control measures such as disease, insects, or wildlife that keep them in check. European starling (*Sturnus vulgaris*), which was identified during biological surveys conducted by the applicant, is considered an agriculture pest by UC IPM (2016). American bullfrog (*Lithobates catesbeianus*), mute swan (*Cygnus olor*), and brown-headed cowbird (*Molothrus ater*) are considered invasive wildlife by CDFW and are known to occur in the region (CDFW 2024f; iNaturalist 2024). Quagga mussels (*Dreissena rostriformis bugensis*) were discovered in the Colorado River at Imperial Dam in Imperial County in February 2008 (CDFW 2021). Native to Ukraine and Russia, these mussels attach to aquatic plants, boats, motors, trailers, and recreation equipment, and can survive out of water for a week or longer (CDFW 2024g).

Designated Critical Habitat and Special Habitat Designations

Designated Critical Habitat. Critical habitat is designated by the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) as essential for the conservation of a federally listed species (USFWS 2017). Federal or private action that may result in a take of a listed species, or destruction or adverse modification of designated critical habitat, requires consultation with the USFWS pursuant to sections 7 or 10 of the Federal Endangered Species Act (FESA). There are no areas designated as critical habitat within the project area. The closest critical habitat is for desert pupfish in San Felipe Creek, over 12 miles west of the project site. The second closest designated critical habitat occurs in the North Algodones Dunes Wilderness over 13 miles to the southeast, which is designated critical habitat for Peirson's milk-vetch (USFWS 2023, NMFS 2023).

Significant Regional Protected Areas

The applicant identified important ecological reserves and designated open spaces that occur within the region (AFC TN249723, Figure 5.2-2). These include the NWR, the Salon Sea State Recreational Area, and Imperial Wildlife Management Areas. In addition, the Salton Sea Monitoring Implementation Plan (CNRA 2022) also identifies the IID Managed Marsh Complex. A review of Google Earth® identified the Niland Ranch Wildlife Habitat Foundation, Inc., a certified wildlife habitat by the National Wildlife Foundation (NWF; Calexico Chronicle 2021). These protected areas provide important habitat for migratory birds along the Pacific Flyway, as well as habitat for several special-status plant and wildlife species.

The NWR is managed by the USFWS and consists of two managed units that contain wetland habitats, farm fields, and desert uplands. The refuge is managed under the LEA

Act, to create and maintain wildlife habitat to reduce crop damage to the surrounding agricultural lands and protect migratory birds and threatened and endangered species, as well as provide opportunities for wildlife-orientated recreation and study and conserve the Salton Sea (USFWS 2024a). The NWR was established in 1930 and includes lands owned and leased along the Salton Sea's southeast shoreline and within the Salton Sea. The project gen-tie lines traverse the edge of the NWR managed lands along Garst Road.

The Salton Sea State Recreation Area is managed by the California Department of Parks and Recreation. This area is located approximately 14 miles northwest of the project site along the Salton Sea's eastern shore. This area provides visitors with recreation opportunities such as bird watching, fishing, boating, camping, hiking, day use, and swimming (CSP 2008).

The Imperial Wildlife Management Area is managed by the CDFW, and includes salt marshes, freshwater ponds, and desert scrub. There are three units in the Wildlife Area: Wister, Finney-Ramer, and Hazard. Wister is located north of the project area, with the southern terminus near Noffsinger Road. Finney-Ramer is along the Alamo River around Ramer Lake, southeast of the project area. Hazard is near Red Island Volcano (CDFW 2024a). The project gen-tie lines traverse the edge of the Hazard Tract along Garst Road, and cross over the Alamo River.

The IID Managed Marsh Complex is located adjacent to Highway 111, approximately two miles south of Niland. This 959-acre complex was constructed in phases between 2009 and 2019 to mitigate increases in salinity and potential selenium impacts within IID's agricultural return flow drains. Project goals include creating habitat, minimizing irrigation water usage, evaluating design, construction and management techniques, and minimizing construction impacts. The Yuma Ridgway's rail and California black rail are target indicator species for the success of the marsh. Once the complex is completed, a conservation easement with CDFW would be put in place (IID 2024, CNRA 2022). The project area just under one mile away at its closest point.

The Niland Ranch Wildlife Habitat Foundation, Inc., is a private property that has been certified as wildlife habitat by the National Wildlife Foundation. The property was burned during Niland fire of 2020, and the property owner has been in the process of restoring habitat on-site. As of 2021, approximately a third of the property has been restored. The site contains Washingtonia palm trees and three relatively large ponds that attract local wildlife, including bobcats, coyotes, skunks, migratory birds, waterfowl snakes, owls, foxes, and muskrats (Calexico Chronicle 2021). The project area is approximately 3.25 miles northeast of the project site at its closest point, near the community of Niland.

Imperial County Conservation and Open Space Element. The Imperial County Conservation and Open Space Element (ICCOSE; Imperial County 2016) is the official conservation guide for all decision makers in the County. The ICCOSE identifies Sensitive Habitats (ICCOSE Figure 1), Sensitive Species (ICCOSE Figure 2), and Agency Designated Habitats (ICCOSE Figure 3). No Sensitive Habitats are identified south of the Salton Sea, other than the Alamo River and New River. The area south of the Salton Sea is not within

desert tortoise modeled habitat or flat-tailed horned lizard modeled species distribution but is within the burrowing owl species distribution model. Agency designated habitats include the NWR and Imperial Wildlife Area, which are discussed under the *Salton Sea Monitoring Implementation Plan* section above.

Aquatic Resources. The project site is within the Salton Sea Watershed (18100200) hydrologic unit (USGS, 2023a). The dominant hydrologic features in this area include Morton Bay, Alamo River, and the Salton Sea. Surface flow is also provided to the Salton Sea by the New River and the Alamo River, which generally flow south to north into the south end of the sea. Large irrigation features in the project area include the East Highline Canal, Coachella Canal, and the Westside Main Canal (USGS, 2023b; GoogleEarth®). The area also has numerous smaller irrigation canals and drains parallel to existing roads that crisscross the project area (EcoAtlas, 2023). These supply canals provide irrigation water while the drains typically convey flow towards the Salton Sea. The Salton Sea is a traditional navigable water under Section 404 (USACE – Los Angeles District 2001; TN252694).

Salton Sea. The Salton Sea is a topographically closed depression with no natural outlet that is a regional and local sink for surface water and groundwater in the watershed. Since 1905, the lake has been sustained by inflows primarily composed of agricultural runoff (USGS 2013). The Salton Sea is a modern-day remnant of Lake Cahuilla, a larger lake at the same spot that may have been the northern terminus of the Gulf of California or an alternate floodplain for the lower Colorado River. Three rivers flow into the Salton Sea – the Whitewater River from the north, and the New River and Alamo River in the south (Audubon 2013a). With no outlet to purge accumulated salts and nutrients, the Salton Sea has become increasingly saline, and current salinity concentrations are significantly higher than ocean water. Though the Salton Sea is high in nutrients, making it a productive ecosystem, it also contributing to deteriorating water quality (IID 2023).

The increased salinity and reduction of water flow to the Salton Sea has created a risk for fish species that reside in the sea, mainly tilapia, and bird species that depend on those species, such as pelicans (Chattopadhyay and Bairagi 2001). Overall, there is evidence that the loss of fish or large invertebrates in deep water habitat is resulting in a loss of bird species, such as grebes, pelican, cormorants, and others that rely on fish species (Audubon 2019).

Inflows into the Salton Sea are primarily farm return flow water, though water also flows in from Mexico during large precipitation events. A decline in the water levels in the Sea have occurred over the last several decades due to climate fluctuations, agricultural conservation measures, cropping practices and decreased inflow from Mexico. The declining water levels have resulted in an increase in salinity, and more particulate air pollution. Governor Brown formed the Salton Sea Task Force in 2015 to address these challenges, resulting in the development of Salton Sea Management Plan (CNRA 2018). The SSMP first 10-year phase (Phase I Plan) outlines short- and long-term goals, the first phase is planned to expedite the construction of habitats and suppress exposed dust areas (SSMP; CNRA 2018). On the southern end of the Salton Sea, much of the receding

playa areas are designated areas for habitat and dust mitigation. Habitat and dust mitigation projects for the outer exterior of the Salton Sea is planned for 2018-2023, and for the interior of the Salton Sea is planned for 2023-2028. These projects include water backbone infrastructure projects, which provide conveyance of river and Salton Sea water to air quality and habitat projects; SSMP air quality and habitat projects associated with the water backbone infrastructure; Phase I Species Conservation Habitat (SCH) Project (saline impoundments along the southern shore to support fish and wildlife); Red Hill Bay Project, an effort of the U.S. Fish and Wildlife Service and IID to restore habitat on the southeastern shore; and Torres Martinez Wetland Project, an effort of the Torres Martinez Desert Cahuilla Indians to build shallow wetlands along the northern edge of the Salton Sea.

Water backbone infrastructure design was planned to be compatible with renewable energy projects by designing them outside or at the edges of the known geothermal resource area. The exception to this is the Red Hill Bay Project; however, the Red Hill Bay Project was canceled in 2023 (TN254015). The SCH Project is at the outlet of New River to the Salton Sea, south of the project site. The Torres Martinez Wetland Project is on the northern end of the Salton Sea. Another CNRA project is outlined north of Morton Bay, outside the project area of the three geothermal projects (CNRA 2018).

The Salton Sea Monitoring Implementation Plan (CNRA 2022) identifies, prioritizes, and describes monitoring activities to track status and trends of resources at the Salton Sea, which can be used to inform the implementation of restoration programs. Monitoring is addressed for several resource areas: hydrology, water quality, geography, air quality, biological resources, and socioeconomics. The Monitoring Implementation Plan identifies Wildlife Lands that are managed by the NWR, IID, and Imperial Wildlife (CNRA 2022).

Alamo River. The Alamo River flows northwest through the middle of the proposed project site and discharges into the Salton Sea. The Alamo River is impacted by "…urban and agricultural runoff, pollution, sedimentation, trash, and invasive species, rarely functioning as naturally flowing river. Much of the floodways…are populated with high-density invasive plant species including salt cedar…[and] giant reed. These species provide low habitat value for listed wildlife species, reduce water availability, increase fire risk in riparian zones, alter soil chemistry, and increase flood risk." (CNRA 2023). Gen-tie line towers and conductors, construction equipment, and work area would be positioned to avoid aquatic resources (TN250679).

Aquatic Resources Delineation. The applicant conducted an aquatic resource delineation of the project area in March 2022. This included a review of the USFWS National Wetlands Inventory (NWI) and USGS National Hydrography Dataset (NHD) maps to determine locations of mapped aquatic resources within the project site (AFC TN249723 Figure 5.2-3). The databases identified the Salton Sea and nearby inundated areas (lake), several excavated wildlife ponds (freshwater ponds), minor irrigation canals and drains (canal or ditch), and areas of palustrine emergent marsh (freshwater emergent wetland) and woodland/scrub-shrub habitat (freshwater forested/shrub wetland) within the project area. At its closest point, one of the project's production wells is adjacent to

the Alamo River along Red Hill Road, and the gen-tie lines cross over the Alamo River at Garst Road (TN249723).

The field delineation identified approximately 58.78 acres of aquatic resources potentially under the jurisdiction of USACE and RWQCB in the study area. A total of 18.14 acres of wetlands were identified during the field delineation. Under the USACE delineation methodology, wetlands display evidence of three parameters: dominant hydrophytic vegetation, the presence of hydric soils, and evidence of wetland hydrology. Within the study area, locations meeting these parameters included two palustrine emergent marsh (PEM) wetlands and three palustrine scrub-shrub (PSS) wetlands. Two watercourses were identified during the field delineation: the Alamo River and a ditch. These features totaled 1.41 acres (1,589 linear feet). A total of 39.23 acres of other aquatic resources were identified during the field delineation. Resources in this section meet two of the three USACE wetland delineation parameters and may qualify as waters of the U.S. (WOTUS) or waters of the state (WOTS). Within the study area, this includes Morton Bay, two salt flats, and three excavated waterbodies (impounded lake, waterfowl hunting pond, and excavated salt flat) (TN252694).

During CEC staff's reconnaissance survey, the CEC's biologist noted whether there was evidence of aquatic resources within and adjacent to the project site. Aquatic resources were observed outside the project area, north of the Construction laydown and parking area on the north side of Cox Road (going east-west). The area immediately to the east of the gen-tie lines along Garst Road, outside the project area, was inundated with water and contained patches of cattails. The plant location near Morton Bay along Schrimpf Road showed evidence of old cattail pools and gastropod shells, indicating past inundation. Morton Bay north of W Schrimpf Road and west of the plant location, outside the project area, contains inundation and marsh habitat known to support Yuma Ridgway's rail and habitat for other marsh bird species. The injection well pad for future expansion along Red Hill Road overlaps a portion of the Morton Bay area. The parcel located northwest of the intersection of Davis Road and McDonald Road, at the location of the northernmost production wells, contained areas of inundation and cattails interspersed with bare ground. A large irrigation canal overgrown with cattails (*Typha* sp.) and common reed (*Phragmites australis*) occurs north of McDonald Road. Patches of inundated areas occur between McDonald Road and Hazard Road, just east of Morton Bay, which also consist of patches of cattails and common reed interspersed with water and bare ground. The CDFW Imperial Wildlife Area Hazard Unit occurs between W Schrimpf Road south to Cox Road, which is located outside, but adjacent to, the plant location.

As the water levels at the Salton Sea decline, previously inundated and likely jurisdictional areas, become dry and may not support surface water in the future. When this occurs, the exposure of previously submerged lakebed, known as playa results in a loss of aquatic habitat and becomes a source of fine airborne dust that is a significant health hazard. Projected playa exposure was modeled by SSMP which anticipated 48,300 acres of new

dry areas would occur by 2028. To counteract the exposure, the plan proposes 29,800 acres of habitat construction in other areas or dust suppression techniques (CNRA 2018).

Staff conducted a review of Google Earth® historic aerial photographs which show a decline of inundated areas since 1985. The location of the production wells adjacent and north of the plant site, and a portion of the plant site itself, has historically and episodically been inundated with water long enough to support the growth of emergent vegetation. Based on a review of Google Earth Pro images from 1985 to present, these areas were at least partially inundated for the following months and years: Dec. 1985; June 1996; May 2002; June, Aug. and Dec. 2005; Jan. and Aug. 2006; Feb. 2008; June 2009; May and June 2012; Mar. 2014; Mar. 2015; and Oct. 2016. Though the areas began to dry out after 2016, remnants of vegetation are still visible. Sections of the northernmost production pads were inundated again in February 2023, which is the most recent aerial photograph.

According to the applicant's AFC (TN249723), the *Imperial County General Plan* indicates that the project site is not located within the 100-year floodplain. The applicant is in the process of requesting a Letter of Map Revision (LOMR) to remap the area because of extensive changes in the Salton Sea elevation in recent years. The applicant submitted this request to FEMA early in the second quarter of 2023. The applicant's Status Report No. 7 (TN256084), dated April 30, 2024, stated the statutory deadline for a response from FEMA had passed in April. However, a change in vendor reviewing applications caused a delay, and FEMA has yet to provide a response. The applicant received informal, minor comments from FEMA and provided responses. A copy of submittals to FEMA would be filed with the CEC in a timely manner. The entire project site would have a perimeter berm for site containment in the event of a clarifier release, which would also provide flood protection, though flooding is not anticipated.

Wildlife Corridors and Special Linkages

Movement and dispersal corridors that connect large blocks of habitat are essential to the long-term viability of plant and wildlife populations. The California Essential Habitat Connectivity Project (Connectivity Project) was commissioned by the California Department of Transportation (Caltrans) and CDFW to create a statewide assessment of essential habitat connectivity to be used for conservation and infrastructure planning (Spencer et. al 2010). One of its goals was to create the Essential Connectivity Map, which depicts large, relatively natural habitat blocks that support native biodiversity (Natural Landscape Blocks) and areas essential for ecological connectivity between them (Essential Connectivity Areas). Another goal of the Connectivity Project was to highlight streams and rivers that provide additional routes for terrestrial and aquatic connectivity between Natural Landscape Blocks and Essential Connectivity Areas, referred to as Potential Riparian Connections (Spencer et. al 2010). These maps do not reflect the needs of particular species but are based on overall biological connectivity and ecological integrity.

Fish and Game Code sections 1955-1958, titled "Wildlife Connectivity Actions," allow CDFW to adopt guidelines to promote habitat connectivity projects in California. Habitat connectivity protects and enhances movement and migration of California's species (CDFW 2023a). The California Department of Transportation (Caltrans) and CDFW (formerly California Department of Fish and Game or CDFG) commissioned the California Essential Habitat Connectivity (CEHC) Project which includes a statewide Essential Habitat Connectivity Map that depicts large, relatively natural habitat blocks that support native biodiversity (Natural Landscape Blocks) and areas essential for ecological connectivity between them (Essential Connectivity Areas) (Spencer et. al 2010). There are no Essential Habitat Connectivity Areas at the project site, the closest approximately 10 miles to the northeast in the Chocolate Mountains (BIOS 2014).

Areas of Conservation Emphasis (ACE) build on the CEHC map by gathering spatial data into maps for conservation planning purposes, including biodiversity, significant habitats, connectivity, climate resilience, and recreation (CDFW 2019a). Most of the project area has a terrestrial connectivity of Rank 1 "limited terrestrial connectivity opportunity", with the exception of the northernmost section that has Rank 3 "connections with implementation flexibility" (important but not identified as core areas) (CDFW 2019b).

The Salton Sea is an important link to the Pacific Flyway, supporting federally or state listed endangered species (IID 2023). The Sea is considered one of the most ecologically productive wetlands on the Pacific Flyway in the Interior West. Upwards of 400 bird species have been recorded at the Salton Sea. The Sea supports, among others, wintering populations of brown pelicans and western grebes, summer populations of Yuma Ridgway rail and California black rail in nearby wetlands, and interior wintering sites and breeding populations of interior western snowy plovers (Jones et. al 2019).

The Important Bird Areas (IBA) Program is a global initiative of BirdLife International, implemented by Audubon and local partners in the United States. The IBA program identifies and aims to conserve areas that are vital to birds and other biodiversity (Cornell 202). The Salton Sea and agricultural areas southeast of the Salton Sea are considered IBAs of global conservation priority level (Audubon 2013a). Most of the wetland habitat is contained within the NWR and the Imperial State Wildlife Area, as well has a handful of private duck clubs and local flood irrigated agricultural fields. The agriculture, irrigation, flooded agriculture, and native alkali sink scrub contribute to a high diversity of bird species that utilize the area year-round (Audubon 2013b).

Plant and Wildlife Species

Common Wildlife. This section describes common wildlife species that were documented during previous studies conducted by the applicant or have the potential to occur in the project area based on an independent review of staff. These include some species that have been designated as "watch list" species by CDFW or as "birds of conservation concern" by USFWS. Special-status species are discussed in the "Special-Status Wildlife" section.

The project area supports a variety of common wildlife species that could use project site, including agricultural areas, vegetated habitats, Salton Sea, irrigation canals, and adjacent areas. Many additional bird species use this region as either wintering habitat, seasonal breeding, or temporary refugia during migration, as the region is in the Pacific Flyway.

The distribution of wildlife in the project area varies by location and proximity to specific habitat. Large exposed barren areas supporting salt crusts typically support fewer species than areas with riparian or wetland vegetation. Agricultural fields often have assemblages of various insects, reptiles, and small mammals. Midsize carnivores and avian species are also associated with these areas, and many follow the crop rotations in the region. Below is a collection of species known from the general region and not all the species were directly observed on the project or ancillary sites.

Invertebrates. Habitat conditions within the project area provide a moderate microhabitat condition for terrestrial and aquatic insects, mollusks, arthropods, crustaceans, and other invertebrates. These microhabitats can primarily be found within the vegetated drains and canals, agricultural edge areas, and other vegetated areas. Salt pans and barren areas likely support a lower diversity of invertebrates.

As in all ecological systems, invertebrates play a crucial role in multiple biological processes. They serve as the primary or secondary food source to a variety of fish, amphibian, reptile, bird, and mammal predators; they provide pollination vectors for numerous plant species; they act as efficient components in controlling pest populations; and they support naturally occurring maintenance of an area by consuming detritus and contributing to necessary soil nutrients.

Focused surveys for invertebrates were not conducted for this project. However, invertebrate species known to occur in the general area include western spotted orbweaver (*Neoscona oaxacensis*), western honey bee (*Apis mellifera*), blue-ringed dancer (*Argia sedula*), western pygmy-blue (*Brephidium exilis*), white checkered-skipper (*Burnsius albezens*), wetsalts tiger beetle (*Cicindela haemorrhagica*), orange sulphur (*Colias eurytheme*), monarch (*Danaus plexippus*), western pondhawk (*Erythemis collocata*), fiery skipper (*Hylephila phyleus*), desert forktail (*Ischnura barberi*), comanche skimmer (*Libellula comanche*), widow skimmer (*Libellula luctuosa*), roseate skimmer (*Orthemis ferruginea*), blue dasher (*Pachydiplax longipennis*), west coast lady (*Vanessa annabella*), painted lady (*Vanessa cardui*), among others (iNaturalist 2024).

Fish. Aquatic and riparian habitat is common in the region and within some portions of the project area. Particularly in the drains that support perennial flow and have connectivity to larger drainages such as the New or Alamo rivers. Fish would be expected to occur in the larger rivers, the margins of the Salton Sea and the various drains that are adjacent to proposed work sites. Some of the species known from the area include red shiner (*Cyprinella lutrensis*), common carp (*Cyprinus carpio*), American gizzard shad (*Dorosoma cepedianum*), western mosquitofish (*Gambusia affinis*), channel catfish (*Ictalurus punctatus*), largemouth bass (*Micropterus salmoides*), Mozambique tilapia

(*Oreochromis mossambicus*), sailfin molly (*Poecilia latipinna*), sailfin molly (*Poecilia latipinna*), and flathead catfish (*Pylodictis olivaris*) (iNaturalist 2024). There has been a long history of introduced fish in the area, but as the sea has continued to grow more saline, most fish have been extirpated from the sea. Desert pupfish (*Cyprinodon macularius*) are no longer found in the sea but do occur in the river deltas, irrigation ditches, and marshes along the edge of the Sea (USFWS 2024b). They would also be expected to occur in many of the drains that border the various project sites.

Amphibians. Amphibian species require a source of standing or flowing water to complete their life cycle. For many species, breeding takes place in aquatic habitats such as lakes, rivers, streams, creeks, and pools. Generally, the larval and juvenile stages occur within the same aquatic habitat. Although some amphibious species may remain within or adjacent to standing or flowing water for their entire lives, other species spend significant portions of their adult lives in upland habitats surrounding aquatic breeding sites. In the project area these species may breed in the various ponds, rivers, and drains. Common amphibians known to occur in the general area include Rio Grande leopard frog (*Lithobates berlandieri*) and American bullfrog (*Lithobates catesbeianus*) (iNaturalist, 2024). Other amphibians common to the area include lowland leopard frogs (*Rana yavapaiensis*), Woodhouse's toad (*Bufo woodhousii*) and red-spotted toads (*Bufo punctatus*). Some of these species would be expected to occur in the project disturbance areas when foraging. Due to environmental factors, amphibians are not found in large numbers or diversity at the NWR (USFWS 2024b).

Reptiles. The number and type of reptile species that may occur at a given site is related to a number of biotic and abiotic features. These include the diversity of plant communities, substrate, soil type, and presence of refugia such as rock piles, boulders, and native debris. These are crucial factors to support the survival and reproduction of various reptile species.

Most reptiles, even if present in an area, are difficult to detect because they are cryptic, and various life history characteristics (i.e., foraging and thermoregulatory behavior) limit their ability to be observed during most surveys. Many species are active only within relatively narrow thermal limits, avoiding hot and cold conditions, and most take refuge in microhabitats that are not directly visible to the casual observer, such as rodent burrows, crevices, under rocks and boards, and in dense vegetation where they are protected from unsuitable environmental conditions and predators. In some cases, they are observed when flushed from their refugia.

Marcy's checkered garter snake (*Thamnophis marcianus marcianus*) and side-blotched lizard (*Uta stansburiana*) were observed in the project area during the biological surveys conducted by the applicant (TN249725). Other reptiles known to occur in the general area include spiny softshell turtle (*Apalone spinifera*), western whiptail (*Aspidoscelis tigris*), western diamondback rattlesnake (*Crotalus atrox*), California king snake (*Lampropeltis californiae*), coachwhip (*Masticophis flagellum*), gopher snake (*Pituophis catenifer*), and desert spiny lizard (*Sceloporus magister*) (iNaturalist 2024; USFWS 2024b).

Birds. The diversity of birds in the project area is a function of the existing habitat, including the Salton Sea, rivers, and large tracts of agricultural lands, and native desert scrub communities in the broader region. The project site is within the Pacific Flyway and numerous species of birds are known to migrate through the region. The Pacific Flyway is a major north-south flyway for migratory birds and extends from Alaska to Patagonia and spans the western U.S.

Birds are the most abundant group of wildlife that is present in the project site and the general area. A total of 45 species of birds were observed during the biological surveys; and many more are listed on iNaturalist and eBird. The project site is next to the SNSSBWF refuge which has some of the most diverse array of bird species of any national wildlife refuge in the West, with over 400 different species recorded and a continuous birding hotspot for rare vagrant species (USFWS 2024b).

The SNSSBWF monitors species that visit the Salton Sea and refuge areas. Starting in the spring, overwinter birds such as snow geese (*Anser caerulescens*), Ross geese (*Anser rossii*), ducks, and shorebirds leave the refuge wetlands to head north to their summer nesting sites. Wood warblers (family Parulidae) and red-winged blackbirds (*Agelaius phoeniceus*) are stopping by to rest and feed before continuing further north. American kestrels (*Falco sparverius*), Northern harriers (*Circus cyaneus*), burrowing owls (*Athene cunicularia*) and other resident raptors are beginning nesting behavior. In the summer, locally common birds that are nesting and rearing include roadrunner (*Geococcyx californianus*), Gambel's quail (*Callipepla gambelii*), and verdin (*Auriparus flaviceps*). Rare species, such as Yuma Ridgway's rail (*Rallus longirostris yumanensis*), Western gull-billed tern (*Gelochelidon nilotica vanrossemi*), and black skimmer (*Rynchops niger*), are also nesting and rearing young. Yellow-footed gull (*Larus livens*), a species typically found in Mexico, migrates through the refuge in late summer. Shorebirds, finished nesting elsewhere, return in August and September and peak in November. These species include Northern shovelers (*Spatula clypeata*), ruddy ducks (*Oxyura jamaicensis*) and other species that migrated out of the area in the spring. Common winter residents include snow geese and sandhill cranes (USFWS 2024b).

Mammals. The distribution of mammals in the project area is associated with the presence of perennial water but may be limited due to the extensive agricultural activities and historic disturbance in the region. However, five common mammals were observed in the project area during the biological surveys conducted by the applicant. These included bobcat (*Lynx rufus*), Botta's pocket gopher (*Thomomys bottae*), coyote (*Canis latrans*), racoon (*Procyon lotor*) and desert cottontail (*Sylvilagus audubonii*) (TN249725). Other species known to occur in the general area include white-tailed antelope squirrel (*Ammospermophilus leucurus*), desert pocket mouse (*Chaetodipus penicillatus*), black-tailed jackrabbit (*Lepus californicus*), striped skunk (*Mephitis mephitis*), big-eared woodrat (*Neotoma macrotis*), muskrat (*Ondatra zibethicus*), brown rat (*Rattus norvegicus*), Mexican free-tailed bat (*Tadarida brasiliensis*), gray fox (*Urocyon cinereoargenteus*), kit fox (*Vulpes macrotis*), round-tailed ground squirrel (*Xerospermophilus tereticaudus*) (iNaturalist, 2024). The refuge is also known to support

Merriam's kangaroo rat (*Dipodomys merriami*), round-tailed ground squirrel (*Xerospermophilus tereticaudus*), and various bat species (USFWS 2024b).

Sensitive Biological Resources

This section provides an overview of sensitive natural communities relative to the project area. It also provides information on special-status plants and animals observed within the project area or with a potential to be present. The specific habitat requirements and the locations of known occurrences of each special-status species were the principal criteria used for inclusion in the lists of special-status species potentially occurring within the project area.

Special-status species are plant and wildlife species that have been afforded special protection by federal, state, or local resource agencies or organizations. Methods to develop a list of special-status species that have the potential to occur in the project site included a literature review that consist of queries from the USFWS Information for Planning and Consultation (IpaC) species list, CDFW California Natural Diversity Database (CNDDB) RareFind 5, CDFW Biogeographic Information and Observation System (BIOS), California Native Plant Society (CNPS) Rare Plant Inventory, California Consortium of Herbaria, iNaturalist, eBird, and Salton Sea Birds (CDFW 2024c) (collectively referred to as 'literature review'). Applicable species from the special-status species list in the Imperial County General Plan Conservation and Open Space Element were reviewed for the proposed project (Minnick 2016). The potential for a special-status species to occur within the project area was determined using the results of the database searches, literature review, applicant and CEC biological reconnaissance surveys, and applicant focused surveys. A summary of the information gathered in in Table 5.2-1 and 5.2-2.

- For the purposes of this analysis, a plant or wildlife species was considered special status if it met one or more of the following criteria: Listed, proposed for listing, or candidates for listing as threatened or endangered species (including designated or proposed critical habitat) under the Federal Endangered Species Act (FESA).
- Listed, or candidates for listing as threatened or endangered under the California Endangered Species Act (CESA).
- Designated by California Department of Fish and Wildlife (CDFW) as Fully Protected (FP) and/or a Species of Special Concern (SSC) in the Special Animals List (CDFW 2024e).
- Bald and golden eagles protected under the Bald and Golden Eagle Protection Act (BGEPA).
- Plants assigned a California Rare Plant Rank (CRPR) by the California Native Plant Society (CNPS) (CDFW 2024d).
- Plants listed as rare under the California Native Plant Protection Act.
- Plants that meet the definition of rare or endangered under the California Environmental Quality Act (CEQA) section 15380 (b) and (d).

- Plants considered special-status species in local or regional plans, policies, or regulations.

There are species designated by CDFW was Watch List (WL) species or by U.S. Fish and Wildlife Service Birds (USFWS) as Birds of Conservation Concern (BCC). These designations do not typically warrant protections under the FESA, CESA, or other federal, state, or local regulations. Most bird species considered WL or BCC species are protected under the Federal Migratory Bird Treaty Act (MBTA) and/or State Fish and Game Code (FGC).

Databases tracks other species with no federal or state special-status listing; these were not included the analysis. Special-status species from these lists with known or potential habitat or distribution within a five-mile buffer of the project were evaluated for potential impacts from construction and operation. The results of this evaluation are discussed in the following sections.

Each of these species was assessed for potential to occur within the project area based on the following criteria:

- **Present**: Species (or sign) was observed in the project area or within the BSA during surveys conducted by the applicant or CEC, or a population has been acknowledged by CDFW, USFWS, or local experts.
- **High**: Habitat (including soils) for the species occurs in the Study Area and a known occurrence occurs within 5 miles within the past 20 years; however, the species was not detected during recent surveys.
- **Moderate**: Habitat (including soils) for the species occurs in the Study Area and a known regional record has been documented, but not within 5 miles of the project site or within the past 20 years; or there is a documented occurrence within 5 miles of the Study Area within the past 20 years and marginal or limited habitat occurs on site; or the species' range includes the geographic area and suitable habitat exists in the Study Area.
- **Low**: Limited habitat for the species occurs in the Study Area and the species' range includes the geographic area, but there are no documented occurrences within 5 miles of the Study Area within the past 20 years.
- **Not Likely to Occur**: Species or signs not observed in the Study Area, the Study Area is outside of the species' known range, and conditions in the Study Area are not suitable for occurrence.

Habitat conditions include soil type, vegetation, and other factors relevant to each species. The criteria are general guidelines and a species' potential for occurrence may be modified based on biological analysis of habitat quality, isolation, and other factors. In this context, species refers to a taxonomic entity and can include recognized subspecies, population segments, or other genetically or geographically distinct units.

Sensitive Natural Communities

CDFW evaluates natural communities using NatureServe's Heritage Methodology, which assigns both Global (G; full natural range within and outside of California) and State (S; within California) state rarity ranks. Ranks range from 1 (very rare and threatened) to 5 (demonstrably secure). Natural Communities with ranks of S1-S3 are considered Sensitive Natural Communities to be addressed in the environmental review processes of CEQA and its equivalents (CDFW 2024b). No Sensitive Natural Communities were identified. Iodine bush scrub/North American Warm Desert Playa corresponds to the *Allenrolfea occidentalis* Shrubland Alliance (iodine bush scrub) in the MCV (Sawyer et. al 2009). This Alliance is ranked G4/S3 and is considered a sensitive natural community by CDFW.

Special Status Plant Species

Rare plant surveys were conducted in March of 2022 (AFC TN249723). Botanists completed a reconnaissance-level botanical survey focused on identifying all land cover and vegetation communities within the biological study area (BSA; TN249723, Figure 5.2-1) and the potential for these communities to support special-status plant species. Windshield surveys were conducted by driving at 15 to 20 miles per hour along dirt and paved roads throughout the entire BSA. Where natural communities with potentially suitable habitat for special-status plants were encountered, botanists conducted surveys in accordance with CDFW and USFWS protocols (CDFW 2018; USFWS 1996). No special-status plants were documented during the rare plant surveys (TN249723). Given the existing anthropogenic use of the area, including agricultural and disturbed lands use, special-status plant species are not anticipated. A summary of the information gathered based on the applicant's data and staff literature review is provided Table 5.2-1.

TABLE 5.2-1 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
Plants			
Salton milk-vetch *Astragalus crotalariae*	Fed: None State: CRPR 4.3	Perennial herb found in sandy and gravelly substrates in Sonoran Desert scrub in Imperial, Riverside, and San Diego cos. From -195-820 ft (-60-250 m). Typically blooms January through April.	**Low.** Poor quality suitable saline and alkaline habitat is present in the project area. CalFlora historical records of this species from 1985 or earlier are within approximately 1 mile. The species was not observed during protocol-level botanical surveys conducted during the blooming season.
Harwood's milk-vetch *Astragalus insularis* var. *harwoodii*	Fed: None	Annual herb sometimes found in gravel and sandy substrates in desert dunes and Mojave Desert	**Not Likely to Occur.** The project area does not contain gravel and

TABLE 5.2-1 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
	State: CRPR 2B.2	scrub from 0 to 2,330 ft (0-710 m). Commonly occurs on desert pavement. Typically blooms January through May. This species is not tolerant of saline conditions.	sandy substrates in desert dunes. There is one CNDDB record of this species within 10 miles of the project area along the Coachella Canal at the base of the Chocolate Mountains.
Gravel milk-vetch *Astragalus sabulonum*	Fed: None State: CRPR 2B.2	Annual or perennial herb found in sandy areas, sometimes gravelly areas; flats, washes, and roadsides in desert dunes and, Mojave and Sonoran Desert scrub in Imperial, Inyo, Riverside, and San Diego from -195 to 3,050 (-60-930 m) elevation. Typically blooms February through June. This species is not known to occur in saline conditions.	**Not Likely to Occur.** The project area does not contain sandy or gravelly areas, washes, or desert dunes. On historic 1906 record occurs within 3 miles of the site near Niland. There are no other records within 10 miles.
Desert fairy duster *Calliandra eriophylla*	Fed: None State: CRPR 2B.3	Perennial deciduous shrub found on sandy and rocky substrates in Sonoran Desert scrub in Imperial, Riverside, and San Diego cos. From 395 to 4,920 ft (120-1,500 m). Typically blooms January through March.	**Not Likely to Occur.** The project area does not contain sandy and rocky substrates. There are no records of this species within 10 miles of the project area.
Munz's cholla *Cylindropuntia munzii*	Fed: None State: CRPR 1B.3	Perennial stem found on gravelly and sandy substrates in Sonoran Desert scrub Imperial and Riverside cos. From 490 to 1,970 feet (150-600 m) elevation. Known only from the Chocolate and Chuckwalla Mtns. Typically blooms in May. This species is not tolerant of saline conditions.	**Not Likely to Occur.** The project area is outside the known range of this species. The project area does not contain sandy and rocky substrates. There is one large CNDDB record for this species just under 10 miles from the project area in the Chocolate Mountains; and a closer approximately 3 miles historic 1931 CalFlora record near Niland.
Glandular ditaxis *Ditaxis claryana*	Fed: None State: CRPR 2B.2	Perennial herb found in sandy substrates in Mojave and Sonoran Desert scrub Imperial, San Bernadino, and Riverside cos. From 0 to 1,525 ft (0-465 m). Typically blooms December through March, sometimes October.	**Not Likely to Occur.** The project area does not contain sandy substrates. There is on historic 1978 CNDDB record approximately 9.5 mile from the project

TABLE 5.2-1 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
			area at the base of the Chocolate Mountains; and a CNPS records within the Iris quad that overlaps agricultural lands and the Chocolate Mountain range near the town of Iris.
Abrams' spurge *Euphorbia abramsiana*	Fed: None State: CRPR 2B.2	Annual herb found in sandy substrates in Mojave and Sonoran Desert scrub in Imperial, Riverside, San Bernardino, and San Diego cos from -15 to 1,3010 ft (-5-915 m) elevation. Typically blooms August through November. May not tolerate saline soils.	**Not Likely to Occur.** The project area does not contain sandy substrates. There are no CNDDB or CalFlora records within 10 miles of the project area.
Arizona spurge *Euphorbia arizonica*	Fed: None State: CRPR 2B.3	Perennial herb found on sandy flats in Sonoran Desert scrub found in Imperial, Riverside, and San Diego cos., as well and S and E to Texas, Mexico, central Baja; from 165 to 985 ft (50-300 m) elevation. Typically blooms from March through April. May not tolerate saline soils.	**Not Likely to Occur.** The project area does not contain sandy flats. There are no CNDDB or CalFlora records within 10 miles of the project area.
Flat-seeded spurge *Euphorbia platysperma*	Fed: None State: CRPR 1B.2	Annual herb found in sandy substrates of desert dunes and Sonoran Desert scrub in Imperial, Riverside, and San Bernardino cos. From 215 to 330 ft (65-100 m) elevation. Typically blooms February through September. May not tolerate saline soils.	**Not Likely to Occur.** The project area does not contain sandy substrates and desert dunes. There are no CNDDB or CalFlora records within 10 miles of the project area.
Curly herissantia *Herissantia crispa*	Fed: None State: CRPR 2B.3	Annual or perennial herb found in Sonoran Desert scrub in Imperial and San Diego cos. .at approximately 2300 ft. (700m) elevation. Known in CA from only two occurrences at Mountain Springs Grade and Vallecito Wash. Typically blooms August through September, sometimes April. May occur in disturbed locations such as roadsides.	**Not Likely to Occur.** The project area is outside the known geographic range of this species. There are no CNDDB or CalFlora records within 10 miles of the project area.
Bitter hymenoxys *Hymenoxys odorata*	Fed: None State: CRPR 2B.1	Annual herb found on sandy substrates in riparian scrub and Sonoran Desert scrub in Imperial, San Bernadino, and Riverside cos.	**Not Likely to Occur.** The project area does not contain sandy substrates. There are no

TABLE 5.2-1 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
		From 150 to 500 ft. (45-150 m) elevation. Typically blooms February through November.	CNDDB or CalFlora records within 10 miles of the project area.
Ribbed cryptantha *Johnstonella costata*	Fed: None State: CRPR 4.3	Annual or perennial herb found on sandy substrates in desert dunes and, Mojave and Sonoran Desert scrub in Imperial, Inyo, Riverside, San Bernardino, and San Diego from -195 to 1,640 (-60-500 m) elevation. Typically blooms February through May.	**Not Likely to Occur.** There is one historic 1906 CalFlora record near Niland, just under 4 miles away; and one CNPS record on the Niland Quad.
Southwestern spiny rush *Juncus acutus* ssp. *leopoldii*	Fed: None State: CRPR 4.2	Perennial rhizomatous herb found in coastal scrub, alkaline seeps and meadows, coastal salt marshes and swamps, and mesic coastal dunes in Imperial, Los Angeles, Marin, Orange, Riverside, San Diego, San Luis Obispo, Santa Barbara, and Ventura from 10 to 2,955 ft (3-900 m) elevation. Typically blooms May through June, sometimes March.	**Low.** Poor quality habitat is present in the project area. This species was not observed during protocol-level botanical surveys conducted in March. There are no CalFlora records within 10 miles of the project area.
Cooper's rush *Juncus cooperi*	Fed: None State: CRPR 4.2	Perennial herb found in mesic, alkaline, or saline meadows and seeps in Imperial, Riverside, San Bernardino, and San Diego cos. From -855 through 5,805 ft. (260 - 1,770 m). Typically blooms. April through May, sometimes in August.	**Low.** Poor quality habitat is present in the project area. This species was not observed during protocol-level botanical surveys conducted in March. There is one CNPS records within 10 miles of the area on the Wister quad just north of Niland.
Torrey's box-thorn *Lycium torreyi*	Fed: None State: CRPR 4.2	Perennial shrub found in rocky and sandy substrates, streambanks, and washes in desert valleys of Mojave and Sonoran Desert scrub in Imperial, Inyo, Los Angeles, Riverside, San Bernardino, San Diego, and Santa Barbara cos. From -165 from 4,005 ft (-50-1,220 m) elevation. Typically blooms March through June, sometimes as early as January, or as late as November	**Not Likely to Occur.** The project area does not contain rocky and sandy substrates, streambanks, or washes. There is one CNPS record within the Kane Spring quad on the western side of the Salton Sea, likely within the sandy habitat.
Slender-lobed four o'clock	Fed: None	Perennial herb found in Sonoran Desert scrub in Riverside, San	**Not Likely to Occur.** The project area is

TABLE 5.2-1 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
Mirabilis tenuiloba	State: CRPR 4.3	Bernardino, San Diego, and Imperial cos. From 755 -3,595 ft (230-1,095 m). Typically blooms March through May, sometimes February.	outside the elevational range of this species. There are no CalFlora records within 10 miles of this project area.
Roughstalk witch grass *Panicum hirticaule* ssp. *hirticaule*	Fed: None State: CRPR 2B.1	Annual herb found in sandy, silty depressions in desert dunes, Mojave and Sonoran Desert scrub, and Joshua tree woodlands in Imperial, Riverside, and San Bernardino cos. From 150 to 4,315 ft (45-1,315) elevation. Typically blooms August through December.	**Not Likely to Occur.** The project area does not contain sandy or silty depressions, desert dunes or Joshua tree woodlands. There are no CNDDB or CalFlora records within 10 miles of the project area.
Sand food *Pholisma sonorae*	Fed: None State: CRPR 1B.2	Parasitic perennial herb found on sandy substrates in desert dunes and Sonoran Desert scrub in Imperial Co. from 0 to 655 ft (0-200 m). Typically blooms April through June.	**Not Likely to Occur.** The project area does not contain sandy substrates and desert dunes. There are no CNDDB records within 10 miles of the project area; and one historic record form 1928 just under 10 miles near Hwy 86 near Elmore Desert Ranch. There is also a CNPS record on the Kane Spring quad in the vicinity of the 1928 record.
Thurber's pilostyles *Pilostyles thurberi*	Fed: None State CRPR 4.3	Internal stem parasite on *Psorothamnus*, especially. *P. emoryi* found in Sonoran Desert scrub in Imperial and San Diego cos. From 0 to 1,200 ft. (0-365 m) elevation. Typically blooms December through April. *Psorothamnus*, may occur on sandy beaches, but this species is not tolerant of saline soils.	**Not Likely to Occur.** The project area does not provide habitat for the host plant *Psorothamnus*, nor was the host plant observed during botanical surveys. There is one undated (prior to 1986) record just under 10 miles away from the project area near Elmore Desert Ranch. Additional CalFlora records, from the 1980s or earlier, occur in the vicinity of Elmore Desert Ranch; and a CNPS record occurs within the Kane

TABLE 5.2-1 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
			Spring quad that overlaps the project area.
Orocopia sage *Salvia greatae*	Fed: None State: CRPR 1B.3	Perennial evergreen shrub found in Mojave and Sonoran Desert scrub in Imperial and Riverside cos. From -130 to 2,705 ft (-40-825 m). Typically blooms March through April. Not known to occur in saline habitats.	**Not Likely to Occur.** The project area has marginal habitat in saline soils. There are no CNDDB or CalFlora records within 10 miles of the project area.
Dwarf germander *Teucrium cubense* ssp. *depressum*	Fed: None State: CRPR 2B.2	Annual herb found in desert dunes, Sonoran Desert scrub, and margins of playas in Imperial and Riverside cos. From 150 to 1,310 ft (45-400 m) elevation. Typically blooms from March to May, sometimes September to November.	**Low.** The project area does not contain desert dunes or playas, and marginal scrub habitat. This species was not observed during the botanical surveys conducted during the blooming season. There are no CNDDB or CalFlora records within 10 miles of the project area.

Sources: CDFW 2024d, CCH 2024; CNPS 2020 and 2024; Calflora 2024; iNaturalist 2024; Jepson 2024a

Federal designations: (federal Endangered Species Act, U.S. Fish and Wildlife Service).

FE: Federally listed, endangered
FT: Federally listed, threatened
FD: Federally delisted
–PRO: Proposed for listing
–CAN: Candidate for listing

State (CA) designations: (California Endangered Species Act, California Department of Fish and Wildlife [CDFW])

SE: State listed, endangered.
ST: State listed, threatened.
SC: State candidate for listing, endangered or threatened
SR: State rare plant

California Native Plant Society Rare Plant Rank (CRPR) designations. Note: According to CNPS (http:// www. cnps. org/ cnps/ rareplants/ ranking. php), plants ranked as California Rare Plant Rank (CRPR) 1A, 1B, and 2 meet definitions as threatened or endangered and are eligible for state listing. That interpretation of the state Endangered Species Act is not in general use.

1A: Plants presumed extinct in California.
1B: Plants rare and endangered in California and throughout their range.
2: Plants rare, threatened, or endangered in California but more common elsewhere in their range.
3: Plants about which we need more information; a review list.
4: Plants of limited distribution; a watch list.
CBR: Considered but rejected. Plants that previously had a CRPR, or were considered for addition, but were rejected.

California Rare Plant Rank Threat designations:

.1 Seriously endangered in California (more than 80% of occurrences threatened / high degree and immediacy of threat)
.2 Fairly endangered in California (20–80% occurrences threatened)
.3 Not very endangered in California (less than 20% of occurrences threatened or no current threats known)

Special Status Wildlife Species

The applicant conducted a reconnaissance-level wildlife survey of the project area in late February and March 2022 (TN249723). The primary focus of this survey was to record observed wildlife species in the project area, including incidental observations, habitat assessment, and occupancy determination of burrowing owls. The biologists recorded all wildlife observations and wildlife sign (such as burrows, tracks, scat, carcasses, and vocalizations). Notes were made on vegetation types providing potentially suitable wildlife habitat. The applicant also conducted habitat assessments for marsh species using the Standardized North American Marsh Bird Monitoring Protocol (Conway 2011), specifically for rail and other marshland bird species. CDFW and USFWS informed the applicant that desert pupfish are presumed present in the project area, hence protocol level surveys were not needed. Based upon review of the literature, databases, and applicant materials, a list of special-status wildlife species that are known or expected to occur in the project area was compiled. A summary of the information gathered based on the applicant's data and staff literature review is provided Table 5.2-2.

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
WILDLIFE SPECIES			
Invertebrates			
Crotch's bumble bee *Bombus crotchii*	State: CE	Inhabits open grassland and scrub habitats. Occurs primarily in CA, including the Mediterranean region, Pacific Coast, Western Desert, Great Valley, and adjacent foothills through most of southwestern CA. Generalist forager reported visiting a wide variety of flowering plants. Agricultural intensification and rapid urbanization in CA's Central Valley may have reduced populations, since this species was historically common in the Central Valley. Tilling may directly destroy bumble bee overwintering sites and bumble bee nests may be at risk of being destroyed by farm machinery.	**Low.** The Salton Sea is within the current range of this species, but areas south of the Salton Sea are within the historical range. The existing agricultural use in the area has likely destroyed potential habitat. One historical 1948 CNDDB occurrence is located over 10 miles south of the project area. There are no iNaturalist records within 10 miles.
Monarch butterfly – California overwintering population *Danaus plexippus plexippus* pop. 1	Fed: CAN State: None	Overwinter in groves of trees scattered from Mendocino County south to Baja California; start to migrate inland in the spring feeding on flower nectar, mating and laying eggs on a variety of milk-weed plants	**Moderate.** Individuals are known to pass through the project area. There are several iNaturalist records around the NWR Visitors Center; and another at Westemorland. No

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
		(*Asclepias* ssp.), the sole source of food for caterpillars.	*Asclepias* species were observed during the botanical surveys. The project area and surrounding area does not contain overwintering groves of trees. The closest CNDDB records of overwintering populations are along the coast, over 90 miles away.
Fish			
Desert pupfish *Cyprinodon macularius*	Fed: FE State: SE	San Felipe Ck and Salt Ck (Imperial Co.); also, several refugia populations and in irrigation canals near Salton Sea.	**Present**. The project is within the geographic range of this species. This species is known to occur in the IID irrigation canals throughout the project area. There are numerous CNDDB occurrences within the irrigation canals bordering the Salton Sea. There is one iNaturalist record over 10 miles away. Critical habitat is in San Felipe Creek, approximately 12.5 miles to the east.
Razorback sucker *Xyrauchen texanus*	Fed: FE State: SE, FP	Habitats required by adults in rivers include deep runs, eddies, backwaters, and flooded off-channel environments in spring; runs and pools often in shallow water associated with submerged sandbars in summer; and low-velocity runs, pools, and eddies in winter.	**Low.** There are historic records from the 1940's and 1950s in the Alamo River draining to the Salton Sea; and 1970s and 1990 records in the East Highline Canal. There are no iNaturalist records for this species. The project area is within the historic range of this species, but not within the current range.
Amphibians			
Sonoran Desert toad *Incilius* (=*Bufo*) *alvarius*	Fed: None State: SSC	Ranged in California along the lower Colorado River and into the Imperial Valley. Found in a variety of water sources used for breeding, including springs, stock ponds, washes, river	**Low.** Known from nearby Arizona, this species is believed to be extinct in California. The last verified records are from 1955. One historic CNDDB record

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
		bottoms and irrigation ditches. It is not known if records in the Imperial Valley are a natural part of the historic range or whether they represent recent range expansion following the development of irrigation.	from 1916 occurs approximately 2.5 miles northeast of the project area. There are no iNaturalist records of this species in CA.
Lowland leopard frog *Lithobates* (=*Rana*) *yavapaiensis*	Fed: None State: SSC	Historically found in slow-moving water along the San Felipe Creek drainage and Lower Colorado River in marshy areas with bulrushes, cattails, and grasses with a willow overstory. Jennings and Hayes, in their 1994 California survey, concluded this species had been extirpated from the state. Isolated populations could remain in the Imperial Valley and the San Felipe Creek drainage, however unlikely. The last record in California is from 1965 in an irrigation ditch east of Calexico. A survey of the Colorado River in 1978 did not find any. Introduced Rio Grande leopard frog (*L. berlandieri*) is known to occur in the marshes of the Salton Sea, complicating identification.	**Low.** This species is likely extirpated from the state. Irrigation ditches are present in the project area that could provide habitat if the species was present. There is one historic record from 1940 approximately 3 miles northeast of the project area. There are no iNaturalist records of this species in the project area.
Couch's spadefoot *Scaphiopus couchii*	Fed: None Stat: SSC	Requires soils that are soft enough to allow burrowing in areas with some vegetation; and presence of temporary desert rain pools that retain water for at least 8 days to allow sufficient time for metamorphosis. Continued agricultural use and development is a threat to this species.	**Low.** The soils and hydrology in the project area have been disturbed through development and agricultural use. There is one CNDDB record 3.5 miles northeast of the project area in a flooded desert scrub, east of Hwy 111 and the SPRR. Several iNaturalist records southwest of agricultural development area in the Algodones Dunes.
Reptiles			
Mojave desert tortoise *Gopherus agassizii*	Fed: FT State: ST	Mojave population of desert tortoise lives in a variety of habitats from sandy flats to	**Not Likely to Occur.** The project area is highly disturbed and does not

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
		rocky foothills, including alluvial fans, washes, and canyons. Desert Arid land with usually sparse vegetation. Found north and west of the Colorado River in Arizona, Utah, Nevada, and California.	provide large expanse of desert arid land. This species geographic range terminates at the Chocolate Mountains, which is reflected in CNDDB and iNaturalist records.
Flat-tailed horned lizard *Phrynosoma mcallii*	Fed: None State: SSC	Occur in Sonoran Desert habitat types including sandy areas (flats, hills, valleys), salt flats, badlands, and gravelly areas. Prefer a layer of fine, wind-blown sand, but can also occur in areas with hard-packed soils to sand dunes and mud hills. Current range is patchy, and includes the Coachella Valley, west of the Salton Seas and the Imperial Valley, and east of the Salton Seas and the Imperial Valley on the west side of the Colorado River.	**Low.** The soils in the project area have been disturbed through development and agricultural use. Distribution is more common east and west of the Salton Sea, and range and modeled habitat for this species occurs in sandy habitat to the east and west outside the agricultural areas. CNDDB records south of the Salton Sea are from the 1970s or earlier. More recent iNaturalist records occur in sandy agricultural areas near existing sandy habitat, the closest is approximately 8 miles away.
Birds			
Cooper's hawk *Accipiter cooperii*	Fed: None State: WL	Most common in forests and woodland habitats but can be found nesting and hunting in suburban parks and neighborhoods; will nest in dense patches of large pines, oaks, or Douglas-firs. Breeding resident throughout most of the wooded portion of the state, under 9,000 ft. elevation. Dense stands with moderate crown-depths used for nesting.	**Low (Nesting).** Though a yearlong resident through much of the state, the Salton Sea area is considered the winter range of this species. The project site does not contain dense patches of trees. iNaturalist and eBird observations are from October to April. There are no CNDDB records of this species within 10 miles. **Present (Foraging).** applicant observed during biological surveys. iNaturalist and eBird

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
			observations in the area. Foraging habitat is present. Cooper's hawks are reported as uncommon at the NWR.
Sharp-shinned hawk *Accipiter striatus*	Fed: None State: WL	Nests in dense, even-aged single-layered forest canopy; usually in dense, pole, and small-tree stands of conifers, which are cool, moist, shaded, little groundcover, near water. Forages in forest openings or edges. Breeds throughout California, including the northern half of the state; lesser extent in the mountains of southern California.	**Low (Nesting).** The project area does not contain dense stands of trees. Riverside, San Diego, and Imperial cos. Considered to be within the winter range of this species. There are no CNDDB records of this species within 10 miles. iNaturalist and eBird observations from Nov. through Feb. **Moderate (Foraging)**. iNaturalist observations in the area. Foraging habitat is present.
Lesser sandhill crane *Antigone (=Grus) canadensis canadensis*	State: SSC	Winter resident and migrant in California from mid-September to early April. In fall and winter, large numbers of cranes shrift considerable distances between areas of concentration in the Central Valley. Waste grains (including milo, corn, wheat, rice, barley, and oats) and other seeds are dominant foods in winter. This species winters in the south are of the Salton Sea.	**Not Likely to Occur (Nesting).** This species does not breed in California. The area south of the Salton Sea is within the winter range. This subspecies is not tracked by CNDDB. iNaturalist observations in the area. eBird observations of 'sandhill crane.' **Present (Foraging).** Sandhill cranes were observed during the applicant's biological surveys flying over flooded agricultural field in the eastern portion of the project buffer. This species is known to winter in the area and forage in agricultural fields.
Greater sandhill crane *Antigone (=Grus) canadensis tabida*	State: ST, FP	Currently breeds only in Siskiyou, Modoc and Lassen counties and in Sierra Valley, Plumas and Sierra counties. In summer, this ssp. occurs in and near wet	**Not Likely to Occur (Nesting).** This species does not breed in Imperial County. There are no CNDDB records or

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
		meadow, shallow lacustrine, and fresh emergent wetland habitats. It winters primarily in the Sacramento and San Joaquin valleys from Tehama Co. south to Kings Co. where it frequents annual and perennial grassland habitats, moist croplands with rice or corn stubble, and open, emergent wetlands. It prefers relatively treeless plains.	iNaturalist observations of this subspecies within 10 miles of the project area. eBird observations of 'sandhill crane.' **Present (Foraging).** Sandhill cranes were observed during the applicant's biological surveys flying over flooded agricultural field in the eastern portion of the project buffer; however, was not identified to subspecies (TN254015). This species is known to winter in the area and forage in agricultural fields.
Short-eared owl *Asio flammeus*	Fed: None State: SSC	Usually occurs in in large, open areas with low vegetation, including prairie and coastal grasslands, heathlands, meadows, shrub steppe, savanna, tundra, marshes, dunes, and agricultural areas. Winter habitat is similar but is more likely to include large open areas within woodlots, stubble fields, fresh and saltwater marshes, weedy fields, dumps, gravel pits, rock quarries, and shrub thickets. Found throughout North America where habitat is present.	**Low (Nesting).** The project area is outside the common breeding range. Breeding in mainland southern California is limited, and typically found along the coast. **Moderate (Foraging).** Historical CNDDB occurrence of this species from 1956. This species is rare to occasionally observed in the Refuge. One iNaturalist observation and one eBird observation, both from Nov.
Burrowing owl *Athene cunicularia*	Fed: BCC State: SSC	Yearlong resident of open, dry grassland and desert habitats, and in grass, forb and open shrub stages of pinyon-juniper and ponderosa pine habitats. Uses rodent or other burrow for roosting and nesting. May dig own burrow in soft soil. Will use pipes, culverts, or other manmade structures when burrows are scarce. In agricultural environments nest along roadsides and water conveyance structures	**Present (Nesting and Foraging).** This species was observed by the applicant during biological surveys. Numerous CNDDB records throughout the area.

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
		surrounded by crops. Can persist in highly developed parcels.	
Redhead *Aythya americana*	Fed: None State: SSC	Yearlong resident at the Salton Sea. Known to breed in the wetlands around the Salton Sea. Build nests with marsh plants near open water. Prefers large lakes with extensive areas of emergent vegetation for nesting. Rests on open water, often far from shore. Eats primarily leaves, stems, seeds, and tubers of aquatic plants, mostly submergent, with smaller amounts of aquatic insects.	**Moderate (Nesting).** Drainages and channels with riparian vegetation provide marginal habitat. Managed ponds near the project provide nesting habitat. This species is not tracked by CNDDB. iNaturalist and eBird observations in the area. **Low (Foraging.)** Mainly forages in open water.
Brant *Branta bernicla*	Fed: None State: SSC	Spring transient at the Salton Sea mainly from December to late May. Primary wintering area is Mexico. Typical habitat is well-protected, shallow marine waters containing eel grass (*Zostera marina*).	**Not Likely to Occur (Nesting).** This species does not nest in California. This species is not tracked by CNDDB. **Moderate (Foraging).** This species is rare to occasionally observed in the Refuge. The project area is within the known winter range of this species. iNaturalist and eBird observations in the area.
Swainson's hawk *Buteo swainsoni*	Fed: None State: ST	Typical habitat is open desert, grassland, or cropland containing scattered large trees or small groves. Nests peripheral to riparian systems or in lone trees in agricultural fields or pastures and roadside trees when available and adjacent to suitable foraging habitat. Has become increasing depending on agricultural for foraging. Breeding range throughout central valley and NE part of CA. Mostly migratory, some yearlong residents in Central Valley. (CDFW page, CDFW species account)	**Low (Nesting).** This species primarily breeds in the Central Valley. There are no CNDDB records of this species within 10 miles of the project area. iNaturalist and eBird observations in the area. **Present (Foraging).** CEC biologists observed this species during biological surveys. Foraging habitat is present.
Costa's Hummingbird *Calypte costae*	FE: BCC State: None	Inhabits Mojave Desert scrub, chaparral, sage scrub, deciduous	**Low (Nesting).** The project area provides

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
		forest, desert scrub and streams with cottonwoods, brittlebush, fourwing saltbush, and other species from near sea level to 4,000 ft. elev. Nest placed in a wide variety of trees, cacti, shrubs, woody forbs, and sometimes vines.	trees, palms and vegetation that could be used for nesting. The Salton Sea area is outside the geographic range of this species, though the yearlong range occurs east and west of the Salton Sea. This pattern is similar in iNaturalist, with only a couple observations over 10 miles south. This species is not tracked by CNDDB. eBird observations present. **Present (Foraging).** This species was observed by the applicant during biological surveys in the vicinity of the proposed switching station in the central portion of the project area buffer (TN254015). The Salton Sea supports overwintering populations. Riparian vegetation at irrigation canals provides foraging habitat.
Western snowy plover *Charadrius nivosus nivosus*	Fed: FT (pacific coast population) State: SSC (coastal and interior population)	Large open areas with low vegetation, including prairie and coastal grasslands, heathlands, meadows, shrub steppe, savanna, tundra, marshes, dunes, and agricultural areas. Winter habitat is similar, but also includes fresh and saltwater marshes, weedy fields, dumps, gravel pits, rock quarries, and shrub thickets.	**High (Nesting and Foraging).** Snowy plover was observed during the applicant's biological surveys in a flooded agricultural field in the eastern portion of the project area buffer; however, this observation could not be identified to subspecies (TN254015). The project area is within the current range of this species, and agricultural areas could provide habitat. One CNDDB record from 1999 located at Morton Bay states this species occurs through the entire Lake area but have

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
			higher concentrations on the western and southeastern shores. No iNaturalist observations but eBird observations are present.
Mountain plover *Charadrius montanus*	Fed: BCC State: SSC	Winter resident, found on short, open grasslands, open sagebrush, plowed fields and foothill valleys in Central Valley and fragmented locations in Southern California. Roosts in depressions such as ungulate footprints and plow furrows. Does not nest in California.	**Not Likely to Occur (Nesting).** This species does not nest in California. **High (Foraging).** Numerous CNDDB records and iNaturalist observations within and near the project area. The project area is within the current winter range. Agricultural fields provide suitable foraging habitat. eBird observations present.
Black Tern *Chlidonias niger*	Fed: BCC State: SSC	Uncommon and local species. Nests on marshy ponds; migrants can be seen over any water from marshes to open ocean and often roost with other terns on sandbars.	**Low (Nesting).** Marginal nesting habitat present. project area is not within the known breeding range of this species. There are no CNDDB records within 10 miles of the project area. **Moderate (Foraging).** iNaturalist observations in the area. Foraging habitat present. eBird and numerous iNaturalist observations present.
Northern harrier *Circus hudsonius*	Fed: BCC State: SSC	Prefer open country, grasslands, steppes, wetlands, meadows, agricultural fields; roost and nest on ground in shrubby vegetation often at edge of marshes. Permanent resident of coastal areas and northeastern plateau. Breeds in Central Valley and Sierra Nevada; widespread winter migrant in suitable habitat	**Moderate (Nesting).** Marginal nesting habitat present in the surrounding area. The project area is within the yearlong range, but not within the known breeding range of this species. There are no CNDDB records within 10 miles of the project area. eBird and numerous iNaturalist observations present. **Present (Foraging):** This species was observed by

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
			the applicant during the biological surveys over an agricultural field in the central portion of the project area buffer (TN254015). Agricultural areas provide suitable foraging habitat.
Olive-sided flycatcher *Contopus cooperi*	Fed: BCC State: SSC	Montane coniferous forest with trees over water or open terrain including mixed conifer, montane-hardwood-conifer, Douglas-fir, red fir, and lodgepole pine. Forages on insects in openings or along edges, using tall, prominent trees and snags as perches. Uncommon to common, summer resident throughout California under 9,000 ft. elev. Exclusion of the deserts, Central Valley, other lowland valleys, and basins.	**Not Likely to Occur (Nesting).** The project area does not provide suitable nesting habitat. The project area is outside the known breeding range of this species. This species is not tracked by CNDDB. **Low (Foraging).** Limited iNaturalist and eBird observations in the area. The project area provides marginal foraging habitat. Outside typical known range.
White-tailed kite *Elanus leucurus*	State: FP	Yearlong resident in coastal and valley lowlands. Known migrant and visitor of Salton Sea. Migrant and visit in the Salton Sea, but rarely breeds in the area. Usually nests in oaks, willows, or trees 6-20 m above ground.	**Moderate (Nesting).** This species rarely breeds in the Salton Sea, though the area is within the yearlong range of the species. There are no CNDDB records within 10 miles of the project area. **High (Foraging).** This species is rarely found away from agricultural areas. Numerous iNaturalist observations in the area. eBird observations also in the area. Open areas and agricultural fields provide foraging habitat.
Little willow flycatcher *Empidonax traillii brewsteri*	State: SE	California summer migrant. Dense willow thickets are required for nesting. Nests found along a stream, standing water, or seep. Breeding range is generally considered to be the higher elevations of the Sierra	**Low (Nesting).** The project area is outside the known breeding range of this species. There are only 2 CNDDB records for this species, both north of Fort Bragg.

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
		Nevada ranges and into the northwestern USA. Known to migrate within the same range as *E. t. extimus*.	**Moderate (Foraging).** The Salton Sea is within the migrant range of this species. There are no iNaturalist records of this species within 10 miles. eBird records are only for the parent species.
Southwestern willow flycatcher *Empidonax traillii extimus*	Fed: FE State: SE	For nesting, requires dense riparian habitats with cottonwood/willow and tamarisk vegetation and microclimatic conditions that are dictated by the local surroundings. Saturated soils, standing water or nearby streams, pools, or cienegas are a component of nesting habitat that also influences the microclimate and density vegetation component. Habitat not suitable for nesting may be used for migration and foraging. Recurrent flooding and a natural hydrograph are important to withstand invading non-native species like tamarisk. The southwestern willow flycatcher is typically found below 8,500 feet of elevation.	**Moderate (Nesting).** The project area provides marginal nesting habitat. The project area lacks natural hydrograph and contains non-native species. One CNDDB record occurs approximately 6 miles away along the East Highline Canal. Habitat consists of a large canal with tamarisk and common reed. **Moderate (Foraging).** Habitat not suitable for nesting may be used for migration and foraging. There are no iNaturalist records of this species within 10 miles. eBird records are only for the parent species.
Merlin *Falco columbarius*	Fed: none State: WL	Uncommon winter migrant. Frequents coastlines, open grasslands, savannahs, woodlands, lakes, wetlands, edges, early successional stages. Seldom found in heavily wooded areas or open deserts. Commonly feeds on shorebirds along shorelines in winter. Occurs most of the western half of the state below 3,900 ft. elev.; rare winter migrant in the Mojave Desert; few records from Channel Islands. (From: ABB 2020, CDFW 2020g)	**Not Likely to Occur (Nesting).** This species does not breed in California. **Moderate (Foraging).** eBird and numerous iNaturalist observations in the area. The project area is within the known winter range of this species. There is one CNDDB record 5 miles from the project area and 2 additional records within 10 miles, all describing overwintering adults.
American peregrine falcon	Fed: FD State: SD	Near wetlands, lakes, rivers, or other water; on cliffs, banks,	**Low (Nesting).** Open areas and structures occur

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
Falco peregriunus anatum		dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site. In California where habitat is present.	in the project area but provide marginal nesting habitat. The project area is within the yearlong range of this species. There are no CNDDB records within Imperial County. This species typically breeds along the coast or in tall buildings. **High (Foraging).** Numerous peregrine falcon parent species iNaturalist observations and eBird sightings in the area, but no subspecies observations.
Gull-billed tern *Gelochelidon nilotica*	Fed: BCC State: SSC	Uncommon and found only at the Salton Sea, in grassy marshes with patches of open mud. At the Salton Sea, requires isolated nesting habitat, including small, bare islets of fine clay within impoundments at the Salton Sea.	**High (Nesting and Foraging).** The southern portion of the Salton Sea is within the current breeding range of this species. There are CNDDB records that are within or adjacent to the project area. eBird, and numerous iNaturalist observations, occur in the area.
Bald eagle *Haliaeetus leucocephalus*	Fed: FD State: SE, FP	Habitat includes rivers and lakes with adjacent woodlands. Large bodies of water are always associated with breeding populations. Nests on large trees in the vicinity of large lakes, reservoirs, and rivers. Wintering birds are most often found near large concentrations of waterfowl or fish.	**Not Likely to Occur (Nesting).** Imperial County and the Salton Sea is outside the known nesting range of this species. There are no CNDDB records within 10 miles of the project area. **Moderate (Foraging).** One iNaturalist observations approximately 2 miles south of the project area of a juvenile in December. eBird record in the area. The area is in the known winter range for this species. Salton Sea provide potential foraging habitat.

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
Yellow-breasted chat *Icteria virens*	Fed: None State: SSC	Occupy early successional riparian habitats with a well-developed shrub layer and an open canopy. Vegetation structure, however, more than age appears to be the important factor in nest-site selection. Nesting habitat is usually restricted to the narrow border of streams, creeks, sloughs, and rivers and seldom forms extensive tracts. Known to breed in the Salton Sea area.	**Moderate (Nesting and Foraging).** The project area is within the current breeding range for this species. Two historic 1960s CNDDB records on the east side of the Salton Sea, approximately 6-13 miles north. eBird observation but no iNaturalist observations within 10 miles.
Least bittern *Ixobrychus exilis*	Fed: None State: SSC	Breeds very locally in marshes in the western United States and throughout much of the eastern United States. Suitable breeding habitats include freshwater and brackish marshes with tall, dense emergent vegetation and clumps of woody plants over deep water. The Sink is a known breeding area. Although most migrate during winter, some remain throughout winter in southern CA, especially in the Sink and the lower Colorado River valley.	**High (Nesting and Foraging).** The project area is within the current breeding and yearlong range for this species. eBird and several iNaturalist observations in the area. No CNDDB records within 10 miles of the project area. This species was detected during Yuma Ridgway rail surveys (TN251679)
Gray-headed (= Dark-eyed) junco *Junco hyemalis caniceps*	Fed: None State: WL	Inhabits white fir association at 7,300 ft (Clark Mountain); also, from dense pinyons above 6,700 ft elev. (Grapevine Mountains). Summer resident of Clark Mountain and Grapevine Mountains.	**Not Likely to Occur (Nesting).** The project area is well below the elevational range for this species. **Low (Foraging).** The project area is within the winter range of the parent species (*J. hyemalis*). One historical 1957 CNDDB record approximately 8.5 miles south near Westmorland. eBird observation but no iNaturalist observations within 10 miles of the project area.
Loggerhead shrike *Lanius ludovicianus*	Fed: None State: SSC	Occurs in broken woodland, savannah, pinyon-juniper woodland, Joshua tree woodland, riparian woodland,	**High (Nesting and Foraging).** eBird and numerous iNaturalist observations in the area.

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
		desert oases, scrub, washes, grasslands, fields, prefers open areas for foraging. Nesting widespread in North America.	project area is within the breeding range of this species. Foraging habitat present. One CNDDB record approximately 9.5 miles east near the Coachella Canal in desert scrub surrounded by dunes, open space, and some agricultural.
California gull *Larus californicus*	Fed: BCC State: WL	Breeds on islands in lakes or rivers. Forages along lakes, bogs, farm fields, lawns, pastures, sagebrush, garbage dumps, feedlots, parking lots, ocean beaches, and open ocean.	**Moderate (Nesting).** The project area does not contain islands used for nesting, but is the proximity of Obsidian Butte, the Alamo River, and the Salton Sea. One 1999 CNDDB record at Obsidian Butte of a nesting colony; no other records within 10 miles. eBird and numerous iNaturalist observations in the area. **Present (Foraging).** Species observed by applicant's biologists. The project area is within the yearlong range of this species. This species is common to abundant year-round at the NWR.
California black rail *Laterallus jamaicensis coturniculus*	Fed: None State: ST CDFW: FP	Rarely seen, yearlong resident of saline, brackish, and fresh emergent wetlands. A majority are found in the tidal salt marshes of the northern SF Bay region, primarily in San Pablo and Suisun Bays. Populations also occur in Sacramento-San Joaquin Delta, coastal southern California at Morro Bay and a few other locations, freshwater marshes in the foothills of the Sierra Nevada, the Salton Sea, and lower Colorado River area.	**High (Nesting and Foraging).** The project area is within the yearlong range of this species. Applicant biologists did not detect this species during protocol-level rail surveys (TN251679). There are several CNDDB records for this species in the area, including a historic 1947 record that overlaps the project; and a more recent 2005 record near Obsidian Butte. There are no eBird records, but one obscured

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
			iNaturalist record in the vicinity of the Salton Sea.
Laughing gull *Leucophaeus atricilla*	Fed: None State: WL	Occasional summer and fall resident. Closest population breeds mainly in northwestern Mexico. Nest in saltmarshes or on islands near the shore. Most commonly found in southern California post-breeding season.	**Not Likely to Occur (Nesting).** This species is a winter migrant that nests outside of California. **Moderate (Foraging).** This species is a summer and fall visit to the Salton Sea. eBird and numerous iNaturalist observations in the area. This species is not tracked by CNDDB.
Gila woodpecker *Melanerpes uropygialis*	Fed: BCC State: SE	Permanent resident of mature cottonwood-tree willow riparian forest, mesquite riparian woodland, and saguaro forest. Formerly found along the lower Colorado River and in the cottonwood groves of the Imperial Valley south of the Salton Sea. Currently known only at scattered locations along the Colorado River between Needles and Yuma and at Brawley in the Imperial Valley.	**Moderate (Nesting and Foraging).** There are palms in the vicinity of the project area that could provide nesting habitat. The project area is within the yearlong range of this species. There are 4 historic (1950s or earlier) and 1 2001 record of this species within 12 miles of the project area. The 2001 record is near Brawley within a salt cedar riparian forest along New River; nearby date palms show nesting cavities. iNaturalist and eBird observation nearby, though more around Brawley.
Wood stork *Mycteria americana*	Fed: None State: SSC	At the Salton Sea, forage in shallow bays, marshy backwaters, canals, and drains. Currently found in very few numbers on the southern end of the Salton Sea, almost exclusively as post-breeding visitors.	**Not Likely to Occur (Nesting).** The project area is outside the breeding range for this species. This species is not tracked by CNDDB. **High (Foraging):** The project is within the current post breeding range of this species. iNaturalist and eBird observations in the area. Foraging habitat is present.

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
Double-crested cormorant *Nannopterum auritum*	Fed: None State: WL	Colonial waterbirds that seek aquatic bodies big enough to support their mostly fish diet, such as rivers and lakes. Requires undisturbed nest-sites beside water, on islands or mainland. Uses wide rock ledges on cliffs; rugged slopes; and live or dead trees, especially tall ones. Fairly common at the Salton Sea and Colorado Rivers, where breeding begins in Jan.	**High (Nesting and Foraging).** iNaturalist and eBird observations in the area. The project area is within the year-round range of this species. There are no CNDDB records for this species within 10 miles of the project area. The closest record is at San Diego.
Long-billed Curlew *Numenius americanus*	Fed: None State: WL	Generally, nest in short grasses including grass prairies or agricultural fields and move to denser grasslands after young have fledged. Winter at the coast and in Mexico.	**Not Likely to Occur (Nesting).** California is within the non-breeding range of this species. This species is not tracked by CNDDB. **Present (Foraging).** This species was observed by the applicant biologist during biological surveys. The project area is within the winter range of this species. This species is common to abundant at the NWR. There are eBird and numerous iNaturalist observations in the area.
Osprey *Pandion haliaetus*	Fed: None State: WL	Uses large trees, snags, and dead-topped trees in open forest habitats for cover and nesting. Any expanse of shallow, fish-filled water, including rivers, lakes, reservoirs, lagoons, swamps, and marshes.	**Not Likely to Occur (Nesting).** The project area does not provide large trees used for nesting habitat and is outside the breeding range for this species. The closest CNDDB record is along the coast. **Moderate (Foraging).** eBird and numerous iNaturalist observations in the area. The project area is within the winter range of this species.
Large-billed savannah sparrow *Passerculus sandwichensis rostratus*	Fed: None CDFW: SSC	Requires specialized open, low salt marsh vegetation around the mouth of Colorado River and adjacent coastlines of the uppermost Gulf of California. *P.*	**Not Likely to Occur (Nesting)**. This species does not breed at the Salton Sea. This

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
		s. rostratus is a winter visitant to saline emergent wetland at the Salton Sea and southern coast. The largest numbers at the Salton Sea are found at Obsidian Butte and the vicinity of New River.	subspecies is not tracked by CNDDB. **Moderate (Foraging).** Known winter and post-breeding resident of the Salton Sea. eBird and iNaturalist records in the project area.
American white pelican *Pelecanus erythrorhynchos*	Fed: BCC CDFW: SSC	Fairly common at the Salton Sea in spring and summer, and common spring and fall migrant at Salton Sea and Colorado River. One-third of the North American population winters in the Salton Sea. White pelicans nest on islands in open flat areas with sandy and rocky substrate. Historically nested in the Salon Sea, however colonies were lost in the 1950s due to declines in loss of habitat from water diversions and land reclamation for agriculture.	**Low (Nesting).** There are no CNDDB records of this species in southern CA. The Salton Sea is within the historic breeding range of this species. **High (Foraging).** The project area is within the yearlong range of this species, but typically migrates to the area post-breeding.
California brown pelican *Pelecanus occidentalis californicus*	Fed: FD State: SD	Found in estuarine, marine subtidal, and marine pelagic waters. The nest is a small mound of sticks or debris on rocky, or low, brushy slopes of undisturbed islands. After breeding, beginning as early as mid-May, individuals leave colonies in the Channel Islands and in Mexico, and disperse along the entire California coast. Small numbers visit the Salton Sea and Colorado River reservoirs. Most return to breeding colonies by March or April. Forages in open water of the Salton Sea. Typically, a post-breeding visitor to the Salton Sea from the Gulf of California population.	**Moderate (Nesting).** This species has been documented historically on small rocky islets offshore of Obsidian Butte, Obsidian Butte, east side of Morton Bay, and the Alamo River delta. Several 1990 CNDDB records around the edge of the Salton Sea at or near the project area. **High (Foraging).** The project area is within the yearlong range of this species, though they typically migrate to the area post-breeding. This species is reported common to abundant year-round at the NWR. eBird and iNaturalist observations in the area.
White-faced ibis *Plegadis chihi*	Fed: None State: WL	Extensive marshes required for nesting. Occurs in freshwater marsh, shallow lacustrine waters,	**Moderate (Nesting).** The riparian and marsh areas provide potential

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
		muddy ground of wet meadows, and irrigated or flooded pastures and croplands. The Salton Sea is within the yearlong range of this species, and the area south of the Salton Seas is within the winter range. In California, this species sometimes nest in stands of saltcedar (tamarisk) that have been flooded. The Imperial Valley is a key wintering area for this species, and they are known to forage in irrigated agricultural land.	nesting habitat. Large CNDDB record at mouth of New River of nesting locations from the 1950s-1980s. Little or no nesting starting in 1963. Next closest CNDDB record is the northern Salton Sea. The Salton Sea is within the yearlong range, and the agricultural lands south of the Salton Sea within the winter range. **Present (Foraging).** This species was observed by the applicant's biologist during biological surveys. eBird and numerous iNaturalist records in the area.
Black-tailed gnatcatcher *Polioptila melanura*	Fed: None State: WL	A common resident below about 1,000 ft (300 m) in desert wash habitat from Palm Springs and Joshua Tree National Monument south, and common along the Colorado River. Now rare in eastern Mojave Desert north to the Amargosa River, Inyo Co. Nests primarily in wooded desert wash habitat, but also occurs sparingly in desert scrub habitat, especially in winter.	**Low (Nesting).** One historical 1968 record in project area, and two more historic records south of the Salton Sea. Marginal habitat present. The southern area of the Sink is outside the current range of this species; though dunes and mountains on either are within the yearlong range. **Moderate (Foraging).** This species is uncommon to common in the Refuge. eBird and iNaturalist records in the area.
Yuma Ridgway's rail *Rallus obsoletus yumanensis*	Fed: FE State: ST, FP	Found in saltwater and freshwater marshes dominated by cattails and bulrush. Found in the lower Colorado River, Salton Sea, and Cienega de Santa Clara, mainly in human made ponds, effluent-supported marshes, and areas formed behind dams/diversions.	**Present (Nesting and Foraging).** This species is known from marshes surrounding the Salton Sea and was detected near Morton Bay. Numerous CNDDB records within the project area and within the area. Potential habitat occurs within the vicinity of the project area.

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
			iNaturalist and eBird observations in the area.
American avocet *Recurvirostra americana*	Fed: BCC State: None	Visitor to salt ponds, fresh and saline emergent wetlands, and mudflat habitats throughout the Central Valley and the central and southern coastal areas. Common most of the year in the Salton Sea, but only a few pairs have been known to nest. Primary nesting habitats are relatively barren islands in salt ponds or alkali lakes, levees, dikes, or untraveled roadbeds, near feeding areas. Also, may nest on salt flats or in wet meadows. Per TN254015, California is not within the breeding range of this species, but the Salton Sea area is known to support overwintering populations.	**Low (Nesting).** Though this species is common throughout the year in the Salton Sea, only a few pairs have been known to nest in the area. This species is not tracked by CNDDB. **Present (Foraging).** This species was observed during the applicants biological surveys in a flooded agricultural field in the eastern portion of the project area buffer (TN254015). eBird and iNaturalist observations in the area.
Bank swallow *Riparia riparia*	Fed: None State: ST	Rely on naturally eroding habitats of major lowland river systems. Uses riparian, lacustrine, and coastal areas with vertical banks, bluffs, and cliffs with fine-textured or sandy soils, into which it digs nesting holes. Forages over riparian, brushland, grassland, wetland, water, and agricultural habitats. Uses open habitats with other swallow species during migration. Bank swallows have been extirpated from southern California due to channelization of rivers and flood control projects.	**Not Likely to Occur (Nesting).** There are no eroding banks of river systems within the project area. This species has been extirpated from southern CA. There are no CNDDB records in Imperial County. **Low (Foraging).** ebird and a couple iNaturalist observations in the project area suggest this species may be transient.
Black skimmer *Rynchops niger*	Fed: None State: SSC	Highly social colonial ground nester that requires large areas of bare earth isolated from terrestrial predators and other disturbances. Colonies most often form on small, constructed islands or on isolated sections of eroded impoundment levees. Breeds primarily in coastal southern CA and the Salton Sea. Commonly roosts on urban	**Moderate (Nesting and Foraging).** The project area is highly disturbed and lacks large areas of bare earth required for nesting. The Salton Sea is within the known breeding range. There is a 1998 CNDDB record adjacent to the project area, and 2 more from the 1970s

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
		beaches in winter, or on mud flats in estuaries. In winter, most birds leave the Salton Sea.	nearby. Typically leaves Salton Sea after nesting. eBird and iNaturalist observations in the area.
Rufous hummingbird *Selasphorus rufus*	Fed: BCC State: None	Typically breed in open or shrubby areas. Nest is built in coniferous or deciduous trees, up to 30 feet high, hidden in drooping branches. During migration, can be found in mountain meadows up to 12,600 ft.	**Low (Nesting and Foraging).** The project area does not provide trees suitable for nesting or meadows suitable for foraging; and is not within the range of this species. This species is not tracked by CNDDB. eBird and one iNaturalist observation suggests this species may be transient.
Yellow warbler *Setophaga petechia*	Fed: None State: SSC	Occupy riparian vegetation near water along streams and in wet meadows with willows and cottonwoods and other riparian shrubs and trees.	**Low (Nesting).** The project area contains marginal riparian habitat. Only 1 historic 1952 CNDDB over 3 miles northeast of the project area. This record is of a museum specimen; no habitat information is provided. The project area is outside the current and historical breeding range of this species but is within the winter range. **Moderate (Foraging).** eBird and iNaturalist records in the area.
Bendire's thrasher *Toxostoma bendirei*	Fed: BCC State: SSC	Closely related with plants in the genera *Yucca* and *Opuntia* and firmly packed dirt with less rocks, sand, and desert pavements. Breed in Mojave Desert scrub with Joshua tree, Spanish Bayonet, Mohave Yucca, cholla cacti, or other succulents. Nests high in shrubs, trees, and cacti.	**Not Likely to Occur (Nesting).** The Salton Sea is outside the known breeding range for this species. There are no CNDDB records in Imperial County or around the Salton Sea. The project area is outside the breeding range of this species. **Low (Foraging).** The project area does not have *Yucca* or *Opuntia* species preferred by this species. The project area is outside

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
			the known range of this species. There is iNaturalist observation, however the location is obscured. There are no eBird observations.
Crissal thrasher *Toxostoma crissale*	Fed: None State: SSC	Occupies a relatively large variety of desert riparian and scrub habitats from below sea level to over 6000 ft. Nests in densest portions of shrubs approximately 1m from the ground. In the Salton Sea area, habitat loss, degradation, and fragmentation, from agricultural and urban development and invasive tamarisk (*Tamarix* spp.), has resulted in this thrasher becoming increasingly local and "uncommon".	**Low (Nesting and Foraging).** There are 4 historical CNDDB records from 1910-1960s of this species south of the Salton Sea. One of those historical records (1969) overlaps the project area. Marginal habitat present. The project area is within the known year-round range of this species but has become uncommon in the Refuge. eBird and 2 iNaturalist records south of the Salton Sea.
Le Conte's thrasher *Toxostoma lecontei*	Fed: BCC State: SSC	Occurs in sparse desert scrub such as creosote bush, Joshua tree, and saltbush scrubs, or sandy-soiled cholla-dominated vegetation. Nests in dense, spiny shrubs or densely branched cactus in desert wash habitat.	**Low (Nesting and Foraging).** There are 4 historic 1950s and earlier CNDDB occurrences around the Salton Sea, the closest 5 miles way of an SBCM specimen. There is 1 additional CNDDB record from 2009 near Rock Hill of an adult (no nest noted). The Salton Sea and area to the south are considered outside the yearlong range of this species, though the yearlong range occurs to the east and west. No eBird or iNaturalist observations within 10 miles.
Yellow-headed blackbird *Xanthocephalus xanthocephalus*	Fed: None CDFW: SSC	Yearlong resident at Salton Sea. Nest in colonies in dense wetlands with emerging vegetation. Known to breed in Imperial County.	**Moderate (Nesting and Foraging).** The project area is within the current breeding range and yearlong range of this species. eBird and iNaturalist observations in

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
			the area. There are no CNDDB records around the Salton Sea.
Mammals			
Pallid bat *Antrozous pallidus*	Fed: None State: SSC	From low-elevation rocky, arid deserts, canyon lands, and shrub-steppe grasslands to higher-elevation conifer forests. Most abundant in xeric ecosystems. Day/night roosts in caves, mines, tree hollows, oak boles, exfoliating bark, and crevices in rocky out-crops and cliffs, as well as bridges, barns, porches, bat boxes, and human-occupied as well as vacant buildings. Occurs throughout California except for high Sierra Nevada from Shasta to Kern counties, and the northwestern corner of California from Del Norte and western Siskiyou counties. To northern Mendocino Co. Very sensitive to disturbance of roosting sites.	**Moderate.** The project area is within the range of this species. Due to the high level of disturbance in the area, roosting in unlikely. All CNDDB records and most iNaturalist observations are in undeveloped areas east and west of the project area. One iNaturalist record is north of the IID Navy Base in a less developed area surrounded by sandy scrub, over 20 miles south of the project area. The project area provides suitable foraging habitat for this species, and this species is known to forage more than 18 miles from roost sites.
Mexican (=hog-nosed) long-tongued bat *Choeronycteris mexicana*	Fed: None State: SSC	Known only from San Diego Co. and only as a summer resident. Uses caves, mines, and probably buildings as nursery sites in desert and montane riparian, desert succulent shrub, desert scrub, and pinyon-juniper habitat.	**Not Likely to Occur.** No suitable habitat to support this species. The project area is outside the known range of this species. There are no CNDDB records or iNaturalist observations of this species within Imperial County.
Spotted bat *Euderma maculatum*	Fed: None State: SSC	Found in foothills, mountains, and desert regions, including arid deserts, grasslands, and mixed conifer forests. Prefers to roost in rock crevices, occasionally found in caves and buildings. Prefers sites with adequate roosting habitat, such as cliffs.	**Moderate.** The project area is within the range of this species. The project area does not contain cliffs or rock crevices; however, there is the potential for roosting in buildings and foraging in surrounding habitat. There are no CNDDB or iNaturalist

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
			records within 10 miles of the project area.
Western mastiff bat *Eumops perotis californicus*	Fed: None State: SSC	Occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub, and urban. Crevices in cliff faces, high buildings, trees, and tunnels are required for roosting.	**Moderate.** The project area is within the range of this species. The project area does not contain cliffs, trees, or tunnel suitable for roosting; however, there is potential for roosting in buildings and foraging in surrounding habitat. The closest CNDDB record from 1994 is approximately 7 miles northeast of the project area in the Chocolate Mtns. There are no iNaturalist observations within 10 miles.
Western yellow bat *Lasiurus xanthinus*	Fed: None State: SSC	Occurs below 600 m (2000 ft) in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. Roosts in trees and palms in and near palm oases and riparian habitats.	**Moderate.** The project area is within the range of this species though suitable habitat is scattered in areas around the Salton Sea, with more suitable habitat occurring in San Diego Co. Nearby palm trees could be used for roosting and emergent wetland could be used for foraging. CNDDB records south of the Salton Sea are from the 1980s and 1990s. One iNaturalist observation is at 5 Palms Hot Springs habitat over 20 miles southeast of the project area.
California leaf-nosed bat *Macrotus californicus*	Fed: None State: SSC	Found from Riverside, Imperial, San Diego, and San Bernardino cos. South to the Mexican border. Desert populations have declined, but this species is fairly common in some areas along the Colorado River. Habitats occupied include desert riparian, desert wash, desert scrub, desert succulent shrub, alkali	**Moderate.** The project area is within the range of this species; however, areas to the east and west provide better habitat. The project area does not contain mine tunnels, caves, or bridges. Potential for roosting in buildings and foraging in

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
		desert scrub, and palm oasis. Day roosts usually are in deep mine tunnels or caves, occasionally in buildings or bridges.	surrounding habitat. The closest iNaturalist record is along the edge of the Salton Sea approximately 8.5 miles southwest of the project area. There are no CNDDB records within 10 miles.
Pocketed free-tailed bat *Nyctinomops femorosaccus*	Fed: None State: SSC	Found in Riverside, San Diego, and Imperial cos. In pinyon-juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oasis. Feeds on flying insects detected by echolocation high over ponds, streams, or arid desert habitat. Prefers rock crevices in cliffs as roosting sites. Reproduces in rock crevices, caverns, or buildings.	**Moderate.** The project area is within the range of this species; however, areas to the east and west provide better habitat. The project area does not contain rock crevices in cliffs. Potential for roosting in buildings and foraging in surrounding habitat. The closest CNDDB record is approximately 7 miles northeast of the site in the Chocolate Mtns. CNDDB records and iNaturalist observations occur east and west of the Salton Sea.
Big free-tailed bat *Nyctinomops macrotis*	Fed: None State: SSC	Records of this species from urban areas in San Diego Co. Roosts in buildings, caves, and occasionally in holes in trees. Probably does not breed in CA. Prefers rugged, rocky canyons.	**Low.** The project area is outside the known range of this species, and does not contain rugged, rocky canyons, or caves. There is one iNaturalist observation in the Chocolate Mtns Identified based on an acoustic recording, however this observation has not been verified. There is one CNDDB record from 1987 over 20 miles south of the project area.
Desert bighorn sheep *Ovis canadensis nelsoni*	Fed: None State: FP	Nelson bighorns occur in desert mountain ranges from White Mts. Of Mono and Inyo cos., south to San Bernardino Mts., thence southeastward to the Mexican border. An isolated population occurs in the San Gabriel Mts. Habitats used	**Not Likely to Occur.** The project area is highly developed/disturbed and does not provide habitat for this species. CNDDB records of this species occur in the Chocolate and San Bernardino mtns to

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
		include alpine dwarf-shrub, low sage, sagebrush, bitterbrush, pinyon-juniper, palm oasis, desert riparian, desert succulent shrub, desert scrub, subalpine conifer, perennial grassland, montane chaparral, and montane riparian. Use rocky, steep terrain for escape and bedding. Remain near rugged terrain while feeding in open habitat.	the east, and in the mountain ranges to the west. iNaturalist records show a similar pattern. iNaturalist obscures taxa threatened by location, including desert bighorn sheep. Based on the description and photograph, the closest iNaturalist observation is likely in natural habitat in Mexico.
Yuma hispid cotton rat *Sigmodon hispidus eremicus*	Fed: None State: SSC	Occurs only along the Colorado River and in the Imperial Valley. Establishment in Imperial Valley in response to agriculture. Most common in grassland and cropland near water. Irrigation ditches and other agricultural areas along the Colorado River and near the Salton Sea.	**High.** Habitat is present in the project area. There are 4 CNDDB records within 10 miles of the project area. The closest CNDDB record is 0.5 miles away along the Vail Lateral 2-A drain (agricultural drainage canal). iNaturalist does not track this subspecies, and all observations of the parent species are outside of California.
American badger *Taxidea taxus*	Fed: None State: SSC, Fur bearing animal	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats with friable soils; require sufficient food source, friable soils, and open, uncultivated ground; prey on burrowing rodents. Dens are excavated for protection, sleeping sites, food storage, places to give birth, and as focal areas for foraging. Entrances to dens generally have a sideways "D" shaped entrance and the excavated soil is piled outside.	**Low.** The project area is within the range of this species. The project area does not provide friable soils and open, uncultivated ground. No den sites were observed. One historic 1937 record based on a museum specimen occurs in the vicinity of Morton Bay. More recent records occur in the dunes and mountain ranges to the east and west of the Salton Sea. iNaturalist observations follow a similar pattern, though a couple observations are in agricultural areas over 20 miles south.

TABLE 5.2-2 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Species	Status	Lifeform and Habitat	Occurrence in Study Area
Desert kit fox *Vulpes macrotis arsipus*	Fed: None State: Fur bearing animal	Little information is available for this subspecies. Open, level areas with loose-textured soils supporting scattered, shrubby vegetation with little human disturbance represent suitable habitats for kit foxes, generally. Some agricultural areas may support these foxes. Pups born in dens excavated in open, level areas with loose-textured soils.	**Low.** The project area is developed/disturbed. Though this species is known to occur in the Refuge, habitat in the agricultural areas south of the Salton Sea is mainly considered unsuitable, with more suitable habitat in the dunes and mountains to the east and west. The project area does not provide suitable denning habitat. This subspecies is not tracked by CNDDB or iNaturalist.

Sources: ABB 2024; Albrecht et al 2017; Barbour 1969; Bjurlin et. al 2005; CDFW 2016, 2024c, and 2024e; CEC and CDFW 2010; iNaturalist 2024; Jones et. al 2016 and 2019; Koch et. al 2012; Marsh et. al 2015; McGrew 1979; O'Farrell and Gilbertson 1986; Ortiz and Barrows 2014; Quinn 2008; Shuford and Gardali 2008; USFWS 2007, 2010a, 2010b, and 2018; WBWG 2017; Vaughan 1959; Xercus 2018; Zeiner et. al 1990.

Federal designations: (federal Endangered Species Act, U.S. Fish and Wildlife Service).
FE: Federally listed, endangered
FT: Federally listed, threatened
FD: Federally delisted
–PRO: Proposed for listing
–CAN: Candidate for listing

State (California) designations: (California Endangered Species Act, California Department of Fish and Wildlife (CDFW))
SE: State listed, endangered
ST: State listed, threatened
SC: State candidate for listing, endangered or threatened
SD: State delisted
SSC: CDFW California Species of Special Concern. Considered vulnerable to extinction due to declining numbers, limited geographic ranges, or ongoing threats.
FP: CDFW Fully Protected species. May not be taken or possessed without permit from CDFW.

Special-Status Wildlife

Based upon Tables 5.2-1 and 5.2-2, species are discussed below have a moderate or higher potential to occur within the project site or larger project area. Species excluded from further consideration occur in the same habitats used by the special-status species that have been included. If present, these species would be protected in the same ways by the conservation measures that are being developed for this project.

Invertebrates

Crotch's bumble bee (*Bombus crotchii*). Crotch's bumble bee is a state candidate for endangered listing. Crotch's bumble bee is a large bee with a short head and large eyes.

It is a short-tongue length species (Koch et. al 2012). They have short hair which is spread evenly across their body. Queens and workers (females) Crotch's bumble bee have a black head and thorax, with yellow on the dorsal anterior thorax, and sometimes yellow on the scutellum. Queens and workers have a similar appearance, however; queens are 22-25 millimeters (mm) in length and workers are 12-20 mm in length (Xerces et. al 2018). Little is known about specific habitat requirements of the species as they can be found in a variety of vegetation communities including grassland, scrub, chaparral, and woodlands. Suitable habitats include grasslands and shrub communities that provide native floral resources. Crotch's bumble bees can persist in semi-natural habitats surrounded by intensely human modified landscapes (Love 2010). The species has been documented at a wide range of elevations ranging from -120 feet below mean sea level to 8,500 feet above mean sea level (CDFW 2023b). Crotch's bumble bees prefer smaller flowers that are abundant with pollen and nectar, such as milkweed (*Asclepias* spp.), chaenactis (*Chaenactis* spp.), deerweed (*Acmispon glaber*), buckwheat (*Eriogonum* spp.) lupines (*Lupinus* spp.), clovers (*Medicago* spp.), phacelias, and sages (*Salvia* spp.) (Xerces et. al 2018; Williams et. al 2014).

Monarch butterfly (*Danaus plexippus plexippus* pop. 1). Monarch butterflies are candidates for federal listing where populations overwinter. Monarch butterflies occur globally; however, the subspecies that inhabits North America is imperiled. This includes the larger eastern population and the smaller western population. Summer adults live two to six weeks and migrating winter monarchs live six to nine months. Adults forage on a wide variety of plant species for nectar to fuel their migration. Monarchs mate and lay eggs on milkweed (*Asclepias* sp.) species, which is the host plant larvae primarily feed on. In California, Monarch butterfly overwinter in coastal groves with moderate temperatures, primarily preferring eucalyptus trees (*Eucalyptus* spp.) but also use native species (Jepsen et. al 2015).

Fish

Desert pupfish (*Cyprinodon macularius*). Desert pupfish is a federal and state endangered species. A small fish, less than three inches long, that is tolerant of high temperatures, high salinities, and low dissolved oxygen concentrations that exceed the levels known for other freshwater fishes. Males are larger than females and become bright blue with orange-tipped fins during the breeding season and exhibit aggressive, territorial behavior. Spawning occurs from spring through autumn, but reproduction may occur year-round depending on conditions. The desert pupfish appears to go through cycles of expansion and contraction in response to weather patterns. In very wet years, populations can rapidly expand into new habitats. Habitats have included clear, shallow waters with soft substrates associated with cienegas, springs, streams, margins of larger lakes and rivers, shoreline pools, and irrigation drains and ditches below 1,585 meters (5,200 feet) in elevation. Naturally occurring populations are now restricted in the U.S. to two streams tributary to, and in shoreline pools and irrigation drains of, the Salton Sea in California (USFWS 2010b).

Razorback sucker (*Xyrauchen texanus*). Razorback suckers are a federal and state endangered species, and a CDFW Fully Protected (FP) species. Razorback suckers are endemic to warm-water portions of large rivers in the Colorado River basin of the southwestern United States. Physical characteristics include a pronounced nuchal hump, small eye, and a cleft lower lip. This fish can grow to be almost a meter in length; however, this is rare. The coloration can range from a brownish black to a uniform gray. An adult's diet consists of macroinvertebrates, algae, detritus, and plankton while larval stages consume algae, microcrustaceans, and detritus (USFWS 2024c; Marsh et. al 2015). This species is found in both lakes and rivers, but most commonly in backwaters, floodplains, flatwater river sections and reservoirs (USFWS 2018). This species, which can live up to 50 years, is tolerant to a wide range of temperatures, turbidity, salinity, and prey. Main reason for species decline is a decreased survival rate of larvae, nonnative species introduction, dam construction. There has also been a reduction of recruitment to known adult populations. This is believed to occur due to insufficient food for larvae and physical barriers such as dams. Ideal spawning habitat consists of cobble or rocky substrate along shorelines. Most life stages inhabit inflow areas, such as reservoir or river inflows, which are thought to have lower populations of nonnative predatory fish species due to the increased turbidity (Albrecht et. al 2017). This species was extirpated from the Salton Sea in the late 1920s (USFWS 2002).

Amphibians and Reptiles

Special status amphibian and reptile species identified during the literature review as having a low potential for occurrences in the project area. All these species are CDFW Species of Special Concern (SSC) species. Though amphibians and reptiles have a low potential to occur in the project site, a discussion of impacts to amphibian and reptile species is provided.

Birds

Lesser sandhill crane (*Antigone (=Grus) canadensis canadensis*). Lesser sandhill crane is a CDFW SSC. Lesser sandhill cranes are omnivores that consume invertebrates, amphibians, reptiles, small mammals, and birds, as well as a variety of plant parts. Waste grains and other seeds are dominate winter foods. This species uses pastures, moist grasslands, alfalfa fields, and shallow wetlands for loafing sites. Roost sites are in a variety of wetland habitats, where cranes spend the night standing in shallow water. There are definitive records of wintering at the south end of Salton Sea in Imperial County, and this subspecies is fairly common in the winter (Shuford and Gardali 2008).

Greater sandhill crane (*Antigone (=Grus) canadensis tabida*). Greater sandhill crane is a state threatened and CDFW FP species. This species breeds in the nigh mountain meadows of northern Sierra Nevada and Cascade Ranges and large high-desert meadows of northeastern California. During wintering, they primarily forage on waste grain in corn, rice, and wheat fields. In summer, this subspecies occurs in and near wet meadow, shallow lacustrine, and fresh emergent wetland habitats. It winters primarily in the Sacramento and San Joaquin valleys from Tehama County south to Kings County, where it frequents annual and perennial grassland habitats, moist croplands with rice or corn

stubble, and open, emergent wetlands. Relatively treeless plains are preferred. This subspecies formerly wintered commonly in southern California (Zeiner et. al 1990; California Ricelands 2020).

Short-eared owl (*Asio flammeus*). Short-eared owl is a CDFW SSC. Numbers of short-eared owls fluctuate dramatically in response to periodic "bust or boom" cycles of the owls' primary prey. This cyclical nature of range expansion and retraction can make it difficult to distinguish between areas of regular versus irregular breeding. Owls require open country that supports concentrations of microtine rodents and herbaceous cover sufficient to conceal their ground nests from predators. Suitable habitats may include salt- and freshwater marshes, irrigated alfalfa, or grain fields, and ungrazed grasslands and old pastures. Breeding in mainland southern California is now exceptional and limited to years of unusual incursions, such as wet winters. This species is generally greatest in numbers during migration and winter, when birds occur more widely in lowland areas of the state. While some individuals are year-round residents, influxes of birds form the north increases numbers within the state during winter, generally between October and early March (Shuford and Gardali 2008).

Burrowing owl (*Athene cunicularia*). Burrowing owl is a CDFW SSC and USFWS Bird of Conservation Concern (BCC) species that is a year-round resident throughout much of the state. Burrowing owls are primarily a grassland species but persist and often thrive in human-altered landscapes. Primary habitat includes burrows for roosting and nesting and relatively short vegetation with only sparse shrubs and taller vegetation. Owls residing in agricultural environments nest along roadsides and water conveyance structures, such as open canals, ditches, and drains surrounded by crops. Nests and roosts are most commonly dug by ground squirrels but may include other mammal dens or holes. In the Imperial Valley, owls may excavate their own burrows in the soft earthen banks of ditches and canals, so availability of burrows is not a limiting factor. Structures such as culverts, piles of concrete rubble, and pipes also are used as nest sites, as well as nest boxes installed as management tools. During the breeding season, owls typically forage close to their burrows, primarily in agricultural areas but also in grassland and grass-forb habitat (Shuford and Gardali 2008, Zeiner et. al 1990).

Redhead (*Aythya americana*). Redhead is a CDFW SSC. The redhead breeds at the Salton Sea April through August. Nests, made from marsh vegetation, are found in freshwater wetlands where vegetation is present (1 m tall) but is adjacent to open water. These birds are known to parasitize other nests including other redhead nests. Broods average 8-10 eggs but may be higher due to parasitism. During wintering season, the birds are found in large bodies of water and forage for food by diving consisting of aquatic vegetation and insects (Shuford and Gardali 2008, Zeiner et. al 1990).

Brant (*Branta bernicla*). Brant is a is a CDFW SSC. This species occurs in the state primarily as a spring and fall migrant and winter visitor. They typically congregate in coastal bays and estuaries. Brant passes mainly far offshore in fall and close inshore in spring, when staging birds are numerous in isolated coastal estuaries. Brant is a food specialist during the nonbreeding season, relying principally on a single native plant, Eel

grass. When Eel grass is limited, they will consume intertidal vegetation, salt marsh vegetation, and upland vegetation (such as cultivated grasses, clover, and grain). Flocks of up to 500 winter migrants occur annually at the Salton Sea; however, they can be faced with a short supply of marginal foods and primarily rely on bulrush (Shuford and Gardali 2008, Zeiner et. al 1990).

Swainson's hawk (*Buteo swainsoni*). Swainson's hawk is state listed as threatened. A single bird was observed migrating through the project area during site visits conducted in the fall of 2023. The Swainson's hawk is a medium-sized raptor with relatively long, pointed wings which curve up somewhat in a slight dihedral while the bird is in flight. The most distinctive identifying feature for adult birds is the lighter colored belly, and the underside of the wing with the linings lighter than the dark gray flight feathers (Zeiner et. al 1990a).

Swainson's hawks breed regularly from southwestern Canada to northern Mexico. The western limit of their breeding distribution extends from eastern Washington to southeastern Arizona. The eastern limit of the breeding range extends from western Minnesota, south to central Texas. Historically, the Swainson's hawk breeding range in California included the Great Basin, Klamath Basin, Sacramento and San Joaquin Valleys, Antelope Valley, Northeastern Plateau, Lassen County, and Mojave Desert. Swainson's hawks still nest in most previously occupied regions of the State, but the number of breeding birds has been greatly reduced throughout major portions of the range, and the species has been extirpated in coastal southern California. Only the Central Valley and Modoc Plateau still support more than a few isolated pairs. In California, migrating flocks of up to 100 or more Swainson's hawks may be observed away from the major mountain ranges during the spring and fall. These observations have become less frequent as the overall population has declined (Zeiner et. al 1990a).

Breeding Swainson's hawks have three general habitat requirements: (1) suitable foraging habitat with adequate prey, (2) nest sites, and (3) isolation from disturbances that may disrupt breeding activities. The primary nest trees in the western Mojave Desert are Joshua trees (*Yucca brevifolia*) and Fremont cottonwoods (*Populus fremontii*), but other large trees could also be used, especially when planted in narrow bands such as agricultural windbreaks (e.g., cottonwoods). Historically, Swainson's hawk has nested throughout the Antelope Valley and western Mojave Desert in addition to the central valley (Zeiner et. al 1990a).

The natural foraging habitat of Swainson's hawk is relatively open stands of grass-dominated vegetation and relatively sparse shrublands. Trees are typically widely scattered or found in bands along riparian corridors. Much of the original habitat has been converted to either urban development or cultivated agricultural uses. Swainson's hawks can forage agricultural fields with many types of crops. However, some studies have found that this species is more abundant in areas of moderate agricultural development than in either grassland or areas of extensive agricultural development. Alfalfa fields are routinely used by foraging Swainson's hawks. Orchards and vineyards in general are not

suitable foraging habitat for Swainson's hawk due to the dense woody cover (Zeiner et. al 1990a).

Western Snowy Plover (*Charadrius nivosus nivosus)*. Western snowy plover is federally listed as threatened along the Pacific coast and is a CDFW SSC for both coastal and interior populations. The western snowy plover is a migratory shorebird species that generally arrive to their breeding grounds from early March to late April, with migration back to wintering grounds occurring in late September (USFWS 2007). The coastal population of western snowy plover is largely non-migratory and breeds along the Pacific coast, within 50 miles on the mainland coast, from Washington state south to Baja California, Mexico, and winters mainly in coastal areas from southern Washington to Central America. Preferred nesting habitats include sand spits, dune-backed beaches, beaches at stream and river mouths, and salt pans at lagoons and estuaries. Other nesting habitats less commonly used include bluff-backed beaches, dredged material disposal sites, salt pond levees, dry salt ponds, and river bars. The western snowy plover typically chooses flat, open areas with sandy or saline substrates and places lacking much vegetation or driftwood as a nest site. The nest consists of a shallow scrape or depression in the sand. Prey includes invertebrates occurring within wet or dry sand, depending upon the location, and surf-cast kelp (USFWS 2007). The interior population breeds in the Central Valley (primarily in the southern San Joaquin Valley), Klamath Basin, Modoc Plateau, Great Basin, and the Mojave and Colorado Deserts including the Salton Sea. Nesting habitats required by the interior population include shores of alkaline and saline lakes, reservoirs, ponds, braided river channels, agricultural waste-water ponds, and salt evaporation ponds (Shuford and Gardali 2008).

Mountain plover (*Charadrius montanus*). Mountain plover is a CDFW SSC. The mountain plover is a migratory shorebird species that generally arrive to their wintering grounds in September and depart for their breeding grounds in mid-March (Shuford and Gardali 2008). This plover species breeds outside of California in the high plains east of the Rocky Mountains from Montana to New Mexico into western Texas and Oklahoma, south to central Mexico. The mountain plover primarily winters in the Central and Imperial Valleys of California in addition to southern Arizona, southern Texas, and northern Mexico. Habitat requirements of the mountain plover are the same year-round and include short-grass prairie and other open, flat sparsely vegetated habitats such as plowed fields and open sagebrush communities (Shuford and Gardali 2008; Zeiner et. al 1990. The mountain plover preys on invertebrates within cracks and crevices in the soil (Shuford and Gardali 2008).

Black tern (*Chlidonias niger*). Black tern is a CDFW SSC. The black tern is a migratory seabird that generally arrive to their breeding grounds in mid-April and depart for their wintering grounds in mid-October. In California, breeding occurs below 6,560 feet elevation in the Modoc Plateau region and mountain valleys of northeastern California and parts of the Central Valley. Black terns have been extirpated from the Sacramento-San Joaquin River Delta and Lake Tahoe, and now mainly breed in northeastern California from Modoc to Plumas and Sierra County, and in rice fields in the Sacramento Valley and

San Joaquin Basin, irregularly in the Tulare Basin. The Salton Sea is a migratory stopover outside their breeding range. Fish consist of a large part of their diet. Nests are small cuplike gatherings of vegetation usually built on floating substrates that is anchored to emergent vegetation or submerged roots, or on small mounds within marshes (Shuford and Gardali 2008).

Northern Harrier (*Circus hudsonius*). Northern harrier is a CDFW SSC. Northern Harrier occurs throughout California, and some breeding populations may be resident. A nomadic species, it is more numerous in the state in the winter than the summer, and breeding numbers may vary with rainfall and prey abundance. Harriers breed from sea level near the coast to 9,000 feet typically in marshes, meadows, weedy borders of lakes, rivers and streams, grasslands, weed fields, grazed pastures, croplands, and other open (treeless) habitats. Nests are built on the ground, mostly within patches of dense, often tall, vegetation in undisturbed areas. Harriers mainly feed on rodents and passerines. Suitable habitat is limited in the southern desert, where breeding pairs have been found Inyo, Kern, Los Angeles, and San Bernardino counties (Shuford and Gardali 2008).

White-tailed kite (*Elanus leucurus*). White-tailed kite is a permanent resident in California that inhabits coastal and valley lowlands and is typically found in agricultural areas. It has increased population numbers and range in recent decades. The white-tailed kite inhabits savanna, open woodlands, marshes, desert grasslands, partially cleared lands, and cultivated fields. This species roosts in trees with dense canopies as well as saltgrass and Bermuda grass. This monogamous species breeds from February to October, with peak activity occurring between May and August. Incubation is solely performed by the female; however, during incubation and the nestling period, the male feeds the female and provides her with food to feed the young. This species primarily feeds on voles and other small mammals but will also take birds, insects, reptiles, and amphibians. Although white-tailed kites are non-migratory, individuals may become nomadic in response to prey availability (Zeiner et. al 1990a).

Little willow flycatcher (*Empidonax traillii brewsteri*). Little willow flycatcher is state listed as endangered. The willow flycatcher has been described as "a little green bird." Little willow flycatcher is a subspecies that breeds at higher elevation sites along the Sierra Nevada and is a winter migrant of southeastern California. This subspecies shares similar ecological requirements as southwestern willow flycatcher, which is described in greater detail below (USDA 2024).

Southwestern willow flycatcher (*Empidonax traillii extimus*). Southwestern willow flycatcher is both federally and state listed as endangered. In California, its breeding range extends from the Mexican border north and inland to the City of Independence in the Owens Valley east of the Sierra Nevada, to the South Fork Kern River in the San Joaquin Valley and coastally to the Santa Ynez River in Santa Barbara County. The southwestern willow flycatcher was formerly a common summer resident throughout California but has been extirpated from most of its historic breeding range in California. Southwestern willow flycatcher is a riparian-obligate species restricted to complex streamside vegetation. Four general habitat types are used by the southwestern willow

flycatcher at its breeding sites: monotypic high-elevation willow; exotic monotypes (e.g., dense stands of tamarisk (*Tamarix* spp.) or Russian olive (*Elaeagnus angustifolius*), especially in the desert southwest; native broadleaf-dominated riparian forest; and mixed native/exotic forests. Of these, native broadleaf-dominated and mixed native/exotic are the primary habitats used by southwestern willow flycatcher in California. The native broadleaf-dominated habitat is composed of a single species, such as Goodding's or other willow (*Salix* spp.) species, or a mixture of broadleaf trees and shrubs, including cottonwood (*Populus* spp.), willow, box elder (*Acer negundo*), ash (*Fraxinus* spp.), and alder (*Alnus* spp.). Stands are usually three to 15 meters (10 to 50 feet) in height and are characterized by trees of different size classes, yielding multiple layers of canopy. The earliest spring arrival of the willow flycatcher in southern California is typically between late April and early May. Breeding territory sizes of the southwestern willow flycatcher vary greatly in relation to population density, habitat quality, and nesting stage. The observed range of territory sizes is 0.1 to 2.30 hectares (0.26 to 5.70 acres), with most in the range of 0.2 to 0.5 hectares (0.5 to 1.2 acres). Clutches of two to four eggs are laid in the third week in June, with fledglings first appearing in mid-July. Fledglings stay close to the nest and to each other for three to five days after leaving the nest and stay in the area for a minimum of 14 to 15 days (USACE and CDFG 2010).

American peregrine falcon (*Falco peregriunus anatum*). American peregrine falcon is both federal and state delisted. American peregrine falcon is a medium-sized raptor with barred wing and tail feathers and flanks. In California, the American peregrine falcon is an uncommon breeder or winter migrant throughout much of the state. It is absent from desert areas. Active nests have been documented along the coast north of Santa Barbara, in the Sierra Nevada, and in other mountains of northern California. As a transient species, the American peregrine falcon may occur almost anywhere that suitable habitat is present. This species breeds in woodland, forest, and coastal habitats. Breeding season occurs from early March to late August. Breeding locations include wetlands, lakes, or rivers on high cliff, banks, or dunes. Other important habitats, during nonbreeding, include riparian areas and coastal and inland wetlands. This species will nest on human-made structures and occasionally use old nests of raptors. Females will average clutch sizes of 3-4; incubation takes approximately 32 days. Breeding sites can have a territory from 5-12 km. The main source of food is a variety of birds up to ducks in size. Also eaten are mammals, insects, and fish. The main reason for population decline is the cumulative effects of pesticides, specifically DDE, from prey consumption (USACE and CDFG 2010).

Gull-billed tern (*Gelochelidon nilotica*). Gull-billed tern is a CDFW SSC. California's largest breeding population of the gull-billed tern is found at the Salton Sea. This species is found to nest on small islands in managed impoundments than at the other nearshore island sites. Nesting sites will be abandoned after large disturbances. Breeds mid-April to late July on ground that is bare or sparse with vegetation. Nests can be simple bare scrapes or can be lined with bits of vegetation, gravel, or dried flakes of silt. Females will have average clutches of 3 eggs which an incubation period of 22-23 days. Young are not able to fly until approximately 5 weeks of age. This bird forages along inshore marine habitats including flooded mudflats, beach strands and dunes, tidal flats, freshwater

drainages/canals, and agricultural fields. The diet, specifically at the Salton Sea, consists of small fish, insects, side-blotched lizards, and crayfish. The largest threat facing terns at the Salton Sea is the loss of isolated nesting habitats to receding water levels which connects the isolated habitat to the mainland. Foraging areas are also under threat due to reduction of irrigated farmlands (Zeiner et. al 1990).

Bald eagle (*Haliaeetus leucocephalus*). Bald eagle is federally delisted, state listed as endangered, and a CDFW FP species. The bald eagle occurs throughout most of North America. Historically, bald eagles bred throughout the mountains of coastal California. Currently, breeding populations exist on the Los Padres and San Bernardino National Forests. The largest wintering population of bald eagles in southern California is at Big Bear Lake in the San Bernardino Mountains. It has been successfully reintroduced as a breeding species on Santa Catalina Island after becoming extirpated from the Channel Islands in the 1950s. This species requires large bodies of water, or free flowing rivers with abundant fish, and adjacent snags or other perches. Perches must be high in large, stoutly limbed trees, on snags or broken-topped trees, or on rocks near water. Bald eagles are active diurnally and yearlong. Bald eagles are primarily fish eaters; however, they are opportunistic and will utilize avian and mammalian prey and carrion if readily available, especially in the nonbreeding season. Bald eagles swoop from hunting perches, or soaring flight, to pluck fish from water. Bald eagles roost communally in winter in dense, sheltered, remote conifer stands (Zeiner et. al 1990). Eagle nests are characteristically large, typically 5 to 6 feet in diameter and 2 to 4 feet tall. Nests are typically places in trees, but this species will nest on other surfaces when no suitable trees are available (Cornell 2024). Nests are 50-200 feet above ground, usually below tree crown and nests are usually near a permanent water source. In southern California, nesting most often occurs in large trees near water, but occasionally nests are on cliffs or the ground. Bald eagles are common as a winter migrant at a few favored inland waters in Southern California (Zeiner et. al 1990a).

Yellow-breasted chat (*Icteria virens*). Yellow-breasted chat is a CDFW SSC. In California, yellow-breasted chat primarily occurs in the northern portion of the state, with elevation range up to 5,000 feet, and is considered scarce in the central and southern portions. In southern California, this species utilizes dense riparian thickets and brushy tangles near watercourses for breeding. The yellow-breasted chat breeds in April or May through August. Nests can commonly be found on vegetation such as blackberry, wild grape, and willow. This species will also nest on non-native vegetation which may help reduce population decline. Females initiate nest construction, which begins shortly after pair formation, above ground in dense shrubs along a river or stream. Both parents tend to nestlings until they fledge at roughly nine days. This species feeds primarily on insects and spiders that are gleaned from the foliage of low trees and shrubs; however, berries and other fruits are also consumed. The loss and degradation of riparian habitat have resulted in a marked decline of breeding populations of yellow-breasted chat in California. Nest parasitism by brown-headed cowbird (*Molothrus ater*) has also contributed to declines. Population at Salton Sea is declining, however nesting pairs are still abundant in Imperial County (Zeiner et. al 1990).

Least bittern (*Ixobrychus exilis*). Least bittern is a CDFW SSC. Least bitterns are known to winter and summer at the Salton Sea. Breeding season occurs from May through August. The three major breeding populations in California occur in the Sacramento Valley, Sink (north and south end), and lower Colorado River valley. Predicting abundance of these species is difficult as they can be aloof and rarely vocalize during winter months. This species will breed in freshwater and brackish marshes that contain tall and dense emergent vegetation. Preferred vegetation includes cattails, common reed (*Phragmites australis*), and tamarisk (*Tamarix* spp.). Within the Salton Sea area, individuals mainly nest in freshwater marshes in managed impoundments, along waterways sustained by agricultural wastewater, and lake edges. Nests are constructed as a platform among emergent vegetation and usually 15-75 cm above the water. The average clutch size is 3 eggs. Young are reared by both parents; reproductive age is unknown. The diet consists of mainly of small fish but also frogs, salamanders, leeches, slugs, crayfish, and aquatic insects. Occasionally roosts and forages in saltcedar (Shuford and Gardali 2008).

Loggerhead shrike (*Lanius ludovicianus*). Loggerhead shrike is a CDFW SSC. Loggerhead shrike is a large-headed bird with a hooked beak and whitish underparts. The loggerhead shrike prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. This species most often occurs in open-canopied valley foothill hardwood forests, valley-foothill hardwood-conifer forests, valley foothill riparian, pinyon-juniper woodlands, desert riparian, and Joshua tree habitats. The breeding season for this species generally begins in late January or early February, earlier than those of other sympatric passerine species, and lasts through July. Breeding habitat is shrublands or open woodlands, having both areas with grass cover and bare ground. Nests are typically constructed in well-concealed microsites in densely foliaged trees or shrubs. Females typically feed nestlings until fledging occurs at 16 to 20 days; however, males will feed nestlings if females are absent from the nest for extended periods of time. This species preys primarily on large insects, but will also take small birds, mammals, amphibians, reptiles, fish, carrion, and various invertebrates. Loggerhead shrikes often impale their prey on barbed wire or other sharp objects. This species is known to breed at the Salton Sea but are more abundant at the Salton Sea during winter (Zeiner et. al 1990).

California black rail (*Laterallus jamaicensis coturniculus*). California black rail is state listed as threatened and a CDFW FP species. The black rail is a small bird, about the size of a sparrow, that is blackish in color with a small bill and a back speckled in white. Around the back of the neck the color is deep chestnut brown. This species inhabits slatwater, brackish, and freshwater marshes. Nesting habitat consists of dense vegetation providing adequate cover and water depths about one inch that do not fluctuate. Pickleweed (*Salicornia* spp.) is preferred over other short species and tall vegetation in the San Francisco Bay, while those in lower Colorado River prefer California bulrush (*Schoenoplectus californicus*) and three-square bullrush (*Schoenoplectus americanus*). Black rails lay three to eight eggs. Nests with eggs have been report from March through June. This species will abandon nest if disturbed before completing a clutch. California populations are resident, and this species has been found away from wetlands post-breeding (Zeiner et. al 1990).

Gila woodpecker (*Melanerpes uropygialis*). Gila woodpecker is state listed as endangered. In California, Gila woodpeckers are known from riparian forests along the Colorado River, and from desert wash woodlands in Imperial County. Prefers desert riparian, desert wash, and agricultural habitats. Breeding season lasts from April through July; solitary breeders that lay 3-5 eggs. Nests are in cavities of riparian trees or saguaro cacti. Where Gila woodpeckers occur in dry desert wash woodlands, they excavate cavity nests in large blue paloverdes trees rather than ironwood. In suburban habitats, they nest in ornamental trees including athel (*Tamarix aphylla*), gum trees (*Eucalyptus* spp.), and palms. Availability of suitable nesting trees is apparently a limiting factor in breeding habitat suitability. European starlings will complete for nest sites. The diet consists of insects, mistletoe berries, cactus fruits, and corn (Zeiner et. al 1990).

Wood stork (*Mycteria americana*). Wood stork is a CDFW SSC. Wood stork, a winter migrant of southern California, can be found within the state during late May to mid-September. Most of these migrants overwinter at the southeastern portion of the Salton Sea; more specifically they are found along the lowermost portions and delta of the Alamo River and adjacent shoreline north to the Wister Unit of the Imperial WA. Foraging occurs, mainly along the New and Alamo River, in shallow bays, marshy backwaters, canals and drains. Potential roosting and foraging habitats include partly submerged vegetation in backwater areas, large snags near the water's edge, and flooded fields. These birds, at the Salton Sea, benefited from foraging on stranded fish from receding floodwaters, which no longer occurs due to water flow management. The diet consists of fish, aquatic snails, crustaceans, amphibians and sometimes birds, mammals, and plant material (Shuford and Gardali 2008).

Large-billed savannah sparrow (*Passerculus sandwichensis rostratus*). Large-billed savannah sparrow is a CDFW SSC. Large-billed savannah sparrow breeds in the delta of the Colorado River and adjacent coasts of the Gulf of California. This species winters, in coastal and inland areas, in southern California. At the Salton Sea nonbreeding visitors are present from late July-mid-February; they are present from late August to early March on the coast. Majority of the Salton Sea population is found at Obsidian Butte and the mouth of the New River. Breeding habitat is limited to open, low salt marsh vegetation around the mouth of the Colorado River. Nonbreeding habitat includes salt marshes, beaches, kelp wracks, wharves, docks, and city streets. At the Salton Sea, this species is found in low halophytic scrub including iodine bush (*Allenrolfea occidentalis*), saltbush (*Atriplex* spp.), five horn smother weed (*Bassia hyssopifolia*), and stands of young tamarisk or salt cedar (*Tamarix ramossissima*) (Shuford and Gardali 2008).

American white pelican (*Pelecanus erythrorhynchos*). American white pelican is a CDFW SSC. American white pelican breeds primarily in the interior of North America and winters on the Pacific coast. Within California, it breeds mainly in the Klamath Basin. Nesting usually occurs on loose substrate, which can be created into nest mounds, such as earthen, sandy, and rocky islands. This species currently migrates to the Salton Sea from mid-October to mid-April. Foraging, often in flocks, occurs in shallow inland waters. Foraging habitats include open areas in marshes, along lakes or rivers, and shallow

coastal marine areas. Occasionally they will forage in deeper waters when fish are near the surface. The diet consists of fish, salamanders, and crayfish. The most common fish consumed are carp, minnows, tui chub, and sometimes salmon (Shuford and Gardali 2008).

California brown pelican (*Pelecanus occidentalis californicus*). California brown pelican is both federally and state delisted. On the Pacific coast, pelicans leave the Gulf of California after breeding, cross the Baja peninsula, and migrate as far north as British Columbia, returning south to breeding areas by the next winter. Brown Pelicans live year-round in estuaries and coastal marine habitats along both the east and west coasts. They breed between Maryland and Venezuela, and between southern California and southern Ecuador; often wandering farther north after breeding as far as British Columbia or New York. On the West Coast they breed on dry, rocky offshore islands. When not feeding or nesting, they rest on sandbars, pilings, jetties, breakwaters, mangrove islets, and offshore rocks. Brown Pelicans mostly eat small fish that form schools near the surface of the water—including menhaden, mullet, anchovies, herring, and sailfin mollies. A foraging pelican spots a fish from the air and dives head-first from as high as 65 feet over the ocean. Pelicans usually feed above estuaries and shallow ocean waters within 12 miles of shore, but sometimes venture over the deeper waters past the narrow continental shelf of the Pacific coast. They occasionally feed by sitting on the surface and seizing prey with their bills, like other pelican species, usually when a dense school of fish is close to the surface and the water is too shallow and muddy to plunge. They also steal food from other seabirds, scavenge dead animals, and eat invertebrates such as prawns (Cornell 2024).

There are four CNDDB records for brown pelican in the vicinity of the geothermal projects. All four records mention a botulism outbreak at the Salton Sea that killed 1,500 brown pelicans in 1996. All four records also mention brown pelicans were observed in low number from 1952-1976, over 98 percent of then juveniles. Several of the records also mentioned that many of the surveys mentioned in these records are non-specific, include a majority of the lake, and are shared between occurrences. This is particularly true of information from the late 1990s regarding bird counts. One record from 1999 consists of eight miles of shoreline along the southeastern Salton Sea. Populations of brown pelicans were also observed in 1999 and from 1994-2004. No information was provided on nesting. A record on Mullet Island states nests with eggs were found in 1996, which failed and a new nest was found a month later, which also failed. Nests and copulation was observed in 1998, but no eggs were found. A small number of individuals were observed in 1999, but no nesting information was provided. No pelicans were observed in 2006 at Mullet Island. The third record is just northeast of Red Island at the Alamo River Delta flowing into the Salton Sea. Nests made from dead reeds and salt cedars were observed in 1996. Three nests with 9 pre-fledging young observed in 1996, but fledging was unconfirmed in a revisit. Nests sites and copulation observed in 1998 but no eggs were observed. Additional pelicans were observed in 1999, and 1994-2004, though no nesting information was provided. The last record is on Obsidian Butte, where 5 nests were observed in 1997, but destroyed by windstorms before any eggs were laid. One to four

nests and copulation was observed in 1998, but no eggs were observed. Birds were observed 1999, and from 1994-2004, though no nesting information was provided. No birds were observed in 2006. Overall, these records indicate a lack of nesting by pelicans over the last two decades.

Yuma Ridgway's (clapper) rail (*Rallus obsoletus* [=*longirostris*] *yumanensis*). Yuma Ridgway's rail is a federally endangered, state threatened, and CDFW FP species. This subspecies of Ridgway's rail is found in saltwater and freshwater marshes dominated by cattails and bulrush with a mix of riparian tree and shrub species along the shorelines. Most of the lower Colorado River and Salton Sea populations are assumed to be non-migratory and remain in the area year-round. Nesting begins in March, with a peak from May to June at the Salton Sea. Historically found in the Colorado River Delta, water diversions for agricultural and municipal uses have destroyed habitat areas. Current habitats are primarily human made, such as managed ponds (also referred to as fields or cells) at the Salton Sea or formed behind dams and diversions on the lower Colorado River. The Salton Sea marshes at NWR and Imperial Sate Wildlife Area were created and are under active management to retain their quality for rails as well as to support other shorebirds and waterfowl. Both NWR and IWA purchase water for the marsh habitats from the IID. As water use and demands change in the valley, costs may increase and priorities for available water may shift. The current levels of selenium at the Salton Sea and other primary habitats are a source of concern for the Yuma clapper rail populations (USFWS 2010a).

Black skimmer (*Rynchops niger*). Black skimmer is a CDFW SSC. Black skimmer breeds on the California coast, from San Francisco to south San Deigo Bay, as well as at the Salton Sea. The first documented breeding at the south end of the Salton Sea was in 1972; reproduction attempts, and success has varied throughout the years at this location. General breeding period is from April-September. This species nests on the ground in undisturbed barren areas. Nests are no more than a depression in the ground or an area where substrate is scratched away. Roosts commonly occur on sandbars or beaches. Individuals average a clutch size of 4-5 eggs and incubation is approximately 23 days. Foraged during the day or night, their diet consists of small fish and crustaceans. Foraging, by skimming the water surface with their lower mandible, usually occurs in shallow water near the mouth of rivers or other water channels. The largest threat for black skimmers is the loss of open nesting habitat by erosion or vegetation growth. High water levels at the Salton Sea threaten existing nesting habitats (Shuford and Gardali 2008).

Yellow warbler (*Setophaga petechia*). Yellow warbler is a CDFW SSC. The yellow warbler is a California migrant, during late March through early October, and breeds from April to late July. In southern California, this species breeds in riparian woodlands situated within lowlands and canyons. Suitable habitat typically consists of riparian forests containing sycamores, cottonwoods, willows, and/or alders. The primary diet of yellow warblers consists of arthropods, such as bees, wasps, caterpillars, flies, beetles, and true bugs, which are usually gleaned from leaf surfaces; however, this subspecies will occasionally

sally to capture prey in flight. Males typically forage higher in trees than females. Nest parasitism by brown-headed cowbird (*Malothrus ater*) has been implicated as a major cause to population declines of yellow warblers in southern California (Zeiner et. al 1990).

Yellow-headed blackbird (*Xanthocephalus xanthocephalus*). Yellow-headed blackbird is a CDFW SSC. Yellow-headed blackbirds are known to nest, from April to July, in Imperial County. This species breeds in marshes that contain tall emergent vegetation, common tule (*Scirpus* spp.) and cattails (*Typha* spp.), and open water. These birds construct nests from dry vegetation in dense cover and are over water approximately 45 cm deep. Nests are usually in marshes that are on the edges of lakes or reservoirs therefore meeting the need of being close to deep water. Males claim a nesting territory that can have up to six females. The diet consists of seeds and during the breeding season will ingest insects. Young consume almost entirely aquatic insects. If food resources are sparce, yellow-headed blackbirds will forage in agricultural fields. Foraging can occur in emergent wetlands, along shorelines, and in open fields up to 1.6 km from nesting colony. Loss of habitat is the main threat to this species, in particular the drainage of wetlands via irrigation, flood control, or water diversion (Shuford and Gardali 2008).

Mammals

Pallid bat (*Antrozous pallidus*). Pallid bat is a CDFW SSC. The pallid bat ranges throughout western North America. They inhabit low elevation rocky arid deserts and canyonlands, shrub-steppe grasslands, karst formations below 6,000 feet; and higher elevation coniferous forests above 7,000 feet. This species is most abundant in xeric ecosystems, including the Great Basin, Mojave, and Sonoran Deserts. This species roost alone, in small groups of 20 individuals or less, or gregariously with hundreds of individuals. Day and night roosts include crevices in rocky outcrops and cliffs, mines, caves, tree (such as basal hollow, bole cavities, exfoliating bark, deciduous trees in riparian areas, and fruit trees in orchards), and various human structures such as bridges, barns, porches, bat boxes, and human occupied and vacant buildings (WBWG 2017).

Spotted Bat (*Euderma maculatum*). Spotted bat is a CDFW SSC. The spotted bat is a solitary species that infrequently will roost or hibernate in small groups. It is found to nearly 9,000 feet in elevation and prefers to inhabit areas of rock cliff and canyons, roosting in highly fractured rock crevices. During summer, bats may travel from low- to high-elevation feeding areas and return prior to dawn. Spotted bat is capable of long distance and rapid flight, and foraging ranges can be large. Individuals forage alone about 6.6-164 feet above ground (WBWG 2017).

Western Mastiff Bat (*Eumops perotis californicus*). Western mastiff bat is a CDFW SSC. Western mastiff bat is colonial bat species that occurs from western Texas to parts of southern California, and most recently in northern California to within a few miles of the Oregon border. In California, it was previously thought that this species occurs only to 1,230 feet (375 m) elevation, however, this species roosts up to 4,593 feet (1,400 m) and can forage up to 8,858 feet (2,700 m). This bat species has limited maneuverability in flight. The distribution of western mastiff bat is likely present only where there are

significant rock features offering suitable roosting habitat. It may be found in broad, open habitats, including desert scrub, chaparral, oak woodland, grasslands, and high elevation meadows of mixed conifer forests. This bat requires open, unobstructed waterways for drinking, and drought conditions can impact the species. This species was detected at the southwestern side of Salton Sea in 2002 during a study regarding allochthonous effects on flora and fauna (Brehme et. al 2009).

Western Yellow Bat (*Lasiurus xanthinus*). Western yellow bat is a CDFW SSC. This species is known to roost in trees, particularly in palms. It forages among trees and over water. The yellow bat is insectivorous. It does not hibernate. Young are generally born from June through July (WBWG 2017). This species is associated with valley foothill riparian forest, desert riparian, desert wash, and palm oasis habitats. This species was detected at the northeastern side of Salton Sea in 2012 during a study regarding occupancy patterns of western yellow bats (Ortiz and Barrows 2014).

California Leaf-nosed Bat (*Macrotus californicus*). California leaf-nosed bat is a CDFW SSC. This bat is colonial, forming large seasonal aggregations. Females congregate in the spring and summer in maternity colonies of typically 100 to 200 bats, although colonies of only 6-20 bats are also found. The California leaf-nosed bat appears to be confined to lowland Sonoran Desert habitat below 900 m. This species also appears to be totally dependent on either caves or mines for roosting. Although it has occasionally been found night roosting in buildings or bridges, its maternity, mating, and overwintering sites are all in mines or caves (WBWG 2017).

Pocketed Free-tailed Bat (*Nyctinomops femorosaccus*). Pocketed free-tailed bat is a CDFW SSC. This species roosts in rocky areas in high cliffs, usually in large colonies. It is also known to roost in buildings, caves, and under roof tiles. This species will form maternity colonies and female will each bear a single offspring between late June and July. The pocketed free-tailed bat forages primarily on moths but will consume a variety of insects. This species is associated with pinyon juniper woodland, desert scrub, palm oasis, desert wash, and desert riparian habitats (WBWG 2017).

Yuma Hispid Cotton Rat (*Sigmodon hispidus eremicus*). Yuma hispid cotton rat is a CDFW SSC. The Yuma hispid cotton rat is generally 125-200 mm in length and weighs 70-200 grams (Stefan and Prince 2002). Occurs most commonly in grassland or agricultural habitat that are dense with perennial grasses and have minimal canopy cover. This species diet consists of grasses and insects and uses nests made of grasses in burrows or on the surface. Cotton rats expanded their range in the Imperial Valley with the expansion of irrigation canals to the region. They can be found in association with marshy areas, wastelands, roadsides, drainage ditches, canals, seeps, and occasionally cropland. Rats can be detected by their well-defined runways and connecting burrows with small piles of freshly clipped vegetation and scattered or small poles of ½-inch long droppings. Nests are made of dry grass or other materials built in shallow burrows or under a rock or log at the ground surface. This species breeds throughout the year, but somewhat less in winter (Clark 1972).

American Badger (*Taxidea taxus*). American badger is a CDFW SSC and fur bearing animal. The American Badger is an uncommon permanent resident of California, and is most commonly found in grassland, shrubland, agricultural, and woodland edge habitats with friable soil for burrowing. Badgers are carnivorous and prey on a variety of species, including ground squirrels, reptiles, birds, and carrion depending on seasonal availability. Badgers, usually solitary animals, mate in the late summer and early fall. During mating season, male badgers will expand their home ranges two to three times the size. Non-breeding home ranges, which may overlap between individuals, range from 1.6-65 km^2 for females and 2.4-541 km^2 for males (Quinn 2008). Badgers along the central coast of California can have a home range as big as 20.85 km2 (Lay 2008). The variability in size may be due to resource availability. These nocturnal, semi-fossorial mammals can be found at elevations up to 13,000 feet. Determination of home range can be based on a variety of factors, not merely preferred habitat type, including size of habitat patch, proximity to other suitable habitat areas, and proximity or urban areas. While home ranges may include some urban areas, den locations are primarily on sloped terrain in preferred habitat (Quinn 2008). Agricultural landscapes can contain many suitable characteristics such as dry, friable soils for burrowing and preferred foraging opportunities. However, agricultural fields may have a higher probability of using rodenticides, individuals may be trapped and culled if causing property damaging, and burrows may be disturbed if tilled (Duquette et. al 2013). Urbanization is negatively impacting badger populations due to habitat fragmentation. Badgers will rarely travel between small patches of habitat (Lay 2008).

Desert Kit Fox (*Vulpes macrotis arsipus*). Desert kit fox is a fur bearing animal. Desert kit fox habitat includes open, arid scrublands, grasslands, and agricultural lands. Creosote bush scrub is the most common habitat association for desert kit fox in California (McGrew 1979). Home range size can vary between 2.6-5.2 km^2. Desert kit fox require friable soils for digging dens. Dens are used for cover, protection from predators and heat, and pup rearing. Suitable soil for dens may be a limited resource for kit fox distribution. Den sites are commonly found adjacent to human disturbance and foxes can adapt easily to human presence. They have been discovered within 200 m of roads; however, this may be due to the association of roads with infrequently disturbed sites (canals/basins) which is preferred den habitat (Bjurlin et. al 2005). Dens close to roads may lead to a decrease in fox predation but an increase in vehicle strikes. Foxes will migrate between dens; larger dens are occupied during natal and pupping seasons (O'Farrell and Gilbertson 1986). The desert kit fox is active mainly at night. Primary food sources are rodents and rabbits (Tannerfeldt et. al 2003).

Regulatory

Federal

Endangered Species Act (16 U.S.C., § 1530 et seq., and 50 C.F.R., part 17.1 et seq.). The Endangered Species Act (ESA) designates and provides for protection of threatened and endangered plant and animal species, and their critical habitat. Its purpose is to protect and recover imperiled species and the ecosystems for which they

depend. It is administered by the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). The USFWS is responsible for terrestrial and freshwater organisms while NMFS is responsible for marine wildlife such as whales and anadromous fish (such as salmon). Species may be listed as endangered or threatened. All species of plants and animals, except pest insects, are eligible for listing. Species are defined to include subspecies, varieties, and for vertebrates, distinct population segments. The ESA protects endangered and threatened species and their habitats by prohibiting the "take" of listed animals and the interstate or international trade in listed plants and animals, including their parts and products, except under federal permit. Take of federally listed species as defined in the ESA is prohibited without incidental take authorization, which may be obtained through Section 7 consultation (between federal agencies) or a Section 10 Habitat Conservation Plan.

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c). This Act—enforced through regulations written by the USFWS—prohibits the "taking" of bald and golden eagles, including their parts, nests, or eggs. To take is defined as to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb" any bald or golden eagle, whether "alive or dead...unless authorized by permit."

Migratory Bird Treaty Act (16 U.S.C., §§ 703-712). The Migratory Bird Treaty Act (MBTA) makes it illegal to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid federal permit. The USFWS has authority and responsibility for enforcing the MBTA.

Clean Water Act Sections 401 and 404. The Clean Water Act (CWA) (33 U.S.C., §§ 1251–1376) and Code of Federal Regulations (CFR) Part 30, Section 330.5(a)(26) requires the permitting and monitoring of all discharges to surface water bodies. Section 404 (33 U.S.C., § 1344) requires a permit from the United States Army Corps of Engineers (USACE) for a discharge from dredged or fill materials into a water of the United States, including wetlands. Section 401 (33 U.S.C., § 1341) requires a permit from the regional water quality control board for the discharge of pollutants. By federal law, every applicant for a federal permit or license for an activity that may result in a discharge into a California water body, including wetlands, must request state certification that the proposed activity will not violate state and federal water quality standards.

Executive Order 12996, Management and General Public Use of the National Wildlife Refuge System Executive Order (EO) 12996. This EO states the mission of the National Wildlife Refuge System is to preserve a national network of lands and waters for the conservation and management of fish, wildlife, and plant resources of the U.S. for the benefit of present and future generations. The EO sets forth guiding principles for public access and involvement, habitat preservation, and local partnerships.

National Wildlife Refuge System Improvement Act of 1997. The Act amends the National Wildlife Refuge System Administration Act of 1966 to include a unifying mission for the Refuge System, a new process for determining compatible uses of refuges, and a

requirement for preparing comprehensive conservation plans. The legislation requires that a comprehensive conservation plan (also known as comprehensive management plan) be in place for each national wildlife refuge within 15 years after passage of this bill. The plans must be revised at least every 15 years. Guidelines for producing a comprehensive conservation plan were published in the Federal Register on May 25, 2000 (65 Fed. Reg. 33,891). The Salton Sea does not have a comprehensive conservation plan completed at the time of this AFC.

Salton Sea Reclamation Act of 1998. The Salton Sea Reclamation Act of 1998 (Public Law 105-372; Sonny Bono Salton Sea Reclamation Act) directs the Secretary of the Interior to: "[C]omplete all studies of various options that permit the continual use of the Salton Sea as a reservoir for irrigation drainage and:

- Reduce and stabilize the overall salinity of the Salton Sea;
- Stabilize the surface elevation of the Salton Sea;
- Reclaim, in the long term, healthy fish and wildlife resources and their habitats; and
- Enhance the potential for recreational uses and economic developments of the Salton Sea."

Lea Act. The Lea Act was enacted to help farmers who experience problems with crop damage from ducks and geese. The Act, enacted on May 18, 1948 (16 USC 695 to 695c; 62 Stat. 238), authorizes the Secretary of the Interior to acquire and develop waterfowl and other wildlife management areas in California, provided the state acquires equivalent acreage. Lands acquired under the Act as management areas are not subject to the prohibition against taking birds, nests, or eggs, and hunting may be regulated in a cooperative manner necessary to carry out the provisions of the Act and subject to the provisions of the Migratory Bird Treaty Act. The NWR currently rents land from IID in partial fulfillment of this Act.

Desert Renewable Energy Conservation Plan. The Desert Renewable Energy Conservation Plan (DRECP) was developed as a Habitat Conservation Plan/Natural Community Conservation Plan and a Bureau of Land Management Land Use Plan Amendment covering both public and private lands across seven counties, including the Salton Sea area in Imperial County (Conservation Biology Institute 2014). The project BSA is within the boundaries of the DRECP, but it is not on Bureau of Land Management lands or Areas of Critical Environmental Concern.

State

California Endangered Species Act (Fish and G. Code, §§ 2050-2098). The California Endangered Species Act (CESA) of 1984 states that all native species of fish, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats, threatened with extinction and those experiencing a significant decline which, if not halted, would lead to a threated or endangered designation, will be protected and preserved. CESA prohibits the take of any species of wildlife designated by the California

Fish and Game Commission as endangered, threatened, or candidate species. The CDFW may authorize the take of any such species if certain conditions are met. These criteria are listed in Title 14 of the California Code of Regulations, section 783.4 subdivisions (a) and (b). For purposes of CESA "take" means to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill these species (Fish and G. Code, § 86).

California Code of Regulations Section 670. California Code of Regulations, Title 14, Division 1, Subdivision 3, Chapter 3, Sections 970.2 and 670.5, list plants and animals of California that are designated as rare, threatened, or endangered.

California Public Resources Code, Division 15, Chapter 6, Section 25527. This section prohibits placing facilities within ecological preserves, wildlife refuges, estuaries, and unique or irreplaceable wildlife habitats of scientific or educational value. The project is not in an area protected by this section.

California Fish and Game Code

- ***Section 1600*****.** Section 1600, et seq. does not specifically contain provisions regulating activities that would impact wetlands, isolated areas containing riparian vegetation, or wetland hydrology. The California Fish and Game Commission policy regarding wetlands resources, updated in August 2005, states that "it is the policy of the Fish and Game Commission to seek to provide for the protection, preservation, restoration, enhancement and expansion of wetland habitat in California" and to "strongly discourage development in or conversion of wetlands." As a result, although the Fish and Game Commission has no independent statutory permitting authority related to wetlands, the policy underscores that the Commission does not support wetland development proposals unless "project mitigation assures there will be 'no net loss' of either wetland habitat values or acreage" and "prefers mitigation which would achieve expansion of wetland acreage and enhancement of wetland habitat values." Section 2785(e) of the Fish and Game Code further states, "Riparian means lands which contain habitat which grows close to and which depends on soil moisture from a nearby freshwater source." The 1993 Executive order W-59-93 establishes the "no net loss" policy to also protect California's wetlands. The California Department of Fish and Wildlife (CDFW) implements this Executive Order.
- ***Section 1900*****.**The section designates state rare, threatened, and endangered plants.
- ***Section 1930.*** This section designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitat.
- ***Section 2700*****.** This section provides funding to the Wildlife Conservation Board and CDFW for acquisition, enhancement, restoration, and protection of areas that are most in need of proper conservation. In the southern Salton Sea area, CDFW operates the Imperial Wildlife Area, consisting of three units: Wister, Hazard, and Finney-Ramer.
- ***Section 3503*****.** This section makes it 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*.** This section makes it unlawful to take, possess, or destroy any birds in the orders Falconiformes and Strigiformes or to take, possess, or destroy the nest or eggs of any such bird.
- ***Section 3513*.** This section protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame birds.
- ***Section 3800*.** All birds occurring naturally in California that are not resident game birds, migratory game birds, or fully protected birds are nongame birds. It is unlawful to take any nongame bird except as provided in this code or in accordance with regulations of the commission or, when relating to mining operations, a mitigation plan approved by the department.
- ***Sections 3511, 4700, 5050, and 5515*.** These sections designate certain species as fully protected and prohibit the take of such species or their habitat unless for scientific purposes (see also Cal. Code Regs., tit. 14, § 670.7). Incidental take of fully protected species may also be authorized in a Natural Community Conservation Plan (NCCP) (Fish and G. Code, § 2835).

Furbearing and Mammal Protection

Additional laws and regulations are in place protecting furbearing mammals are as follows:

- Fish and Game Code §251.1 prohibits the harassment of any furbearing mammal. Harass is defined as an intentional act that disrupts an animal's normal behavior patterns, which includes, but is not limited to, breeding, feeding, or sheltering.
- California Code of Regulations Title 14 §460 states that fisher, marten, river otter, desert kit fox and red fox may not be taken at any time.

Porter-Cologne Water Quality Control Act (Water Code §§ 13000 et seq.). The State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs) have jurisdiction over all surface water and groundwater in California, including wetlands, headwaters, and riparian areas. The SWRCB or applicable RWQCB must issue waste discharge requirements for any activity that discharges waste that could affect the quality of waters of the state.

Streambed Alteration Agreement. Fish and Game Code Section 1603 et seq. regulates activities that may divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake designated by the CDFW in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit. A Streambed Alteration Agreement may be required for impacts to ephemeral drainages along the gen-tie line route. Streambed Alteration Agreement requirements, if

applicable, will be incorporated in the CEC licensing process, rather than through a separate agreement with CDFW. The CEC will incorporate CDFW requirements in its COC.

Local

Imperial County General Plan: Conservation and Open Space Element. The purpose of the Conservation and Open Space Element of the Imperial County General Plan is to ensure the managed use of environmental resources and prevent limiting the range of resources available to future generations, with an emphasis on scarce resources and special control and management of certain resources.

The Conservation and Open Space Element contains specific biological resource objectives to integrate programmatic strategies for the conservation of critical habitats to manage their integrity, function, productivity, and long-term viability, including:

- Objective 2.1: Designate critical habitats for Federally 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 primary mechanism to implement the goals and objectives of the Conservation and Open Space Element is to incorporate environmental concerns into land use planning. Thus, this Element also incorporates the previous policies and then identifies the programs the County intends to undertake to promote them. Under the heading of Biological Resource Conservation, the County defines the following relevant land planning policies:

- Provide a framework for the conservation and enhancement of natural and created open space which provides wildlife habitat values.
- Landscaping should be required in all developments to prevent erosion on graded sites and, if the area is contiguous with undisturbed wildlife habitat, the plan should include revegetation with native plant species.

The Conservation and Open Space Element also contains specific water resource objectives to conserve, protect, and enhance water resources in the County, including:

- Objective 6.1: Ensure the use and protection of all the rivers, waterways, and groundwater sources in the County for use by future generations.

- Objective 6.3: Protect and improve water quality and quantity for all water bodies in Imperial County.

Conservation of the Salton Sea is also a component of the Conservation and Open Space Element. The County includes objectives to work towards comprehensive restoration of the Salton Sea to provide recreation, healthy habitat for wildlife, and economic revitalization in the region, including:

- Objective 9.2: Encourage renewable energy developments that include Salton Sea restoration components.
- Objective 9.3: Coordinate with US Fish and Wildlife Service, California Department of Fish and Wildlife, and the Salton Sea JPA in developing programs to protect and restore migratory bird habitat, desert pup fish, and other sensitive or endangered species associated with the Salton Sea.

Under the heading of Open Space and Recreation Conservation, the County defines various land planning policies that apply to both water resources and Salton Sea conservation, including:

- The County shall participate in conducting detailed investigations into the significance, location, extent, and condition of natural resources in the County.
- The County will establish a policy to clean up the Salton Sea and the rivers of Imperial County, specifically the New River and the Alamo River, in order to promote water recreation activities, habitat conservation, water quality, and other beneficial uses.

Imperial County General Plan: Noise Element. The Imperial County General Plan Noise Element identifies that many riparian bird species are sensitive to excessive noise and, as such, they are considered a sensitive receptor.

Cumulative

Appendix 5.6A of the applicant's Application for Certification (TN249723) provides a list of cumulative projects within six miles of the proposed project. Staff's independent list of cumulative projects is provided in Table 1-2 of **Section 1 Executive Summary**. These projects include:

- Calipal Solar Farm I (Wilkinson Solar Farm), Calipatria (Approved)
- Wilkinson Solar Farm/Lindsey Solar Farm, Niland (Pending Construction
- Midway Solar Farm IV, Calipatria (Approved, not built)
- Wister Solar Energy Facility Project (Ormat Wister Solar), Niland (Under Construction)
- Hell's Kitchen Goethermal Exploration Project, Niland (Approved, not built)
- Energy Source Mineral ALTiS, Imperial County (Pending Construction)
- Elmore North Geothermal Project, Imperial County (Pending Permit)

- Black Rock Geothermal Project, Imperial County (Pending Permit)
- Geo Hudson Ranch, McDonald Road and Davis Road (Approved)
- Nidar 100 MW Solar Project, Calipatria (Pending Entitlement)
- VEGA SES 2, 3, and 5 Solar Energy Project, Niland (Approved, not built)

5.2.2 Environmental Impacts

BIOLOGICAL RESOURCES Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
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, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of 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 Communities Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, biological resources.

5.2.2.1 Methodology and Thresholds of Significance

Methodology

Reconnaissance-level Buffer Surveys

Applicant biologists surveyed 1,487.01 acres that included the proposed project footprint and buffer areas to allow for flexible placement of project features while avoiding sensitive areas (TN249723). This biological study area (BSA) (TN249723, Figure 5.2-1) included 150 feet buffers for potential temporary impacts associated with construction except construction laydown yards, construction camps, borrow pits, parking lots, and pull sites. Buffers of 150 feet were set to capture potential temporary impacts associated with construction for all project elements except construction laydown yards, construction camps, borrow pits, parking lots, and gen-tie line pull sites. Construction laydown yards, construction camps, and borrow pits were unbuffered. Buffers around parking lots were not described. Gen-tie line pull sites were buffered by 0.2 acre. The geothermal facility was buffered by one mile and the well pads, associated pipelines, auxiliary features, and gen-tie line were buffered by 1,000 feet. Potential permanent impacts were captured using a 50-foot buffer on the same project elements to account for operations. Habitat, land cover, and vegetation community mapping was conducted within a one-mile radius of the generating facility and within 1,000 feet of the well pads, pipelines, auxiliary features, and linear features, where access was permitted (TN249723).

Vegetation Communities and Land Cover

Applicant biologists characterized natural vegetation communities in the field based on dominant and subdominant plant species and community structure and form (TN249723). Vegetation within the biological survey area (BSA) was classified using vegetation and land cover descriptions following the Landcover Descriptions for the Southwest Regional Gap Analysis Project (SWRegGAP) (NatureServe 2004) and A Manual of California Vegetation, Second Edition (MCV) (Sawyer et. al 2009). Both classifications are presented on Figure DRR-25 (TN252552). The SWRegGAP classification provides specifics regarding the land cover (i.e., habitat) associated with the vegetation community, and nonnatural land cover types. A total of three natural vegetation communities were mapped in the project area, and six different nonnatural land cover types were mapped.

Botanical Surveys

Botanists visited special-status plant reference site populations to confirm that the surveys were conducted at a time of year when species would be apparent and identifiable. Potential reference sites were found by searching the Consortium of California Herbaria (CCH; https://www.cch2.org/portal/index.php) for documented herbarium vouchers within 50 miles of the BSA. Reference populations were visited for Cooper's rush, Salton milk-vetch, and southwestern spiny rush. The Cooper's rush reference population had blooming individuals. The Salton milkvetch reference population has dried remnants that were confirmed by UC Riverside herbarium staff. The

southwestern spiny rush reference population was visited, and remnant populations were visible but positive identification was not possible (TN249723).

Applicant botanists conducted botanical surveys in the project area in late February and March 2022. Botanists completed a reconnaissance-level botanical survey focused on identifying all land cover and vegetation communities within the project area and the potential for these communities to support special-status plant species. Windshield surveys were conducted by driving at 15 to 20 miles per hour along dirt and paved roads throughout the entire project area. Most of the project area is highly manipulated by agricultural land use or degraded without vegetation, thus lacking in potentially suitable habitat for any special-status plant species. When natural communities with potentially suitable habitat for special-status plants were encountered, botanists conducted surveys in accordance with CDFW 2018 *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* and USFWS 1996 *Guidelines for conducting and reporting botanical inventories for federally listed, proposed and candidate plants* protocols (TN249723).

Applicant botanical surveys were floristic in nature[1], with all taxa identified to the taxonomic level necessary to determine whether they are a special-status plant species. Common plant names were taken from the Jepson Interchange List of Currently Accepted Names of Native and Naturalized Plants of California (2022; https://ucjeps.berkeley.edu/interchange/). Common plant names not provided in the Jepson eFlora list were taken from Calflora (2022; https://www.calflora.org/search.html). Further details of the botanical surveys are provided in TN249723, Section 5.2 Biological Resources.

CEC staff conducted a literature review of special-status plants known to, or with the potential to, occur in the Study Area. Results of the literature review are summarized in Table 5.2-1 and Table 5.2-2.

Wildlife

Recon Surveys: Applicant biologists conducted a reconnaissance-level wildlife survey in late February and March 2022 to record observed wildlife species in the project area and vicinity, including incidental observations of burrowing owls. Biologists recorded all wildlife observations and wildlife sign (such as burrows, tracks, scat, carcasses, and vocalizations). Notes were made on vegetation types providing potentially suitable wildlife habitat. No protocol-level burrowing owl surveys, in accordance with the CDFW 2012 *Staff Report on Burrowing Owl Mitigation*, were conducted because presence was presumed. Of California's breeding burrowing owl population, 70 percent is present in agricultural fields in Imperial County. Biologists conducted windshield surveys and pedestrian surveys when burrowing owl, burrows, or burrowing owl sign was observed,

1 CDFW developed *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (2018). Botanical field surveys should be floristic in nature, meaning that every plant taxon that occurs in the project area is identified to the taxonomic level necessary to determine rarity and listing status.

and recorded incidental observations of burrowing owls in the BSA and buffers (TN249723).

Rail Surveys. The proposed area of development either overlaps or is adjacent to land managed by the NWR, which manages wetlands within this area to provide nesting and year-round habitat for rails species and other marshland bird species. The applicant prepared *Distribution and Occupancy of Yuma Ridgway's rails within proposed geothermal development areas in Imperial Valley, California* (TN251679). Surveys were conducted at potential rail habitat in marshes and roadside irrigation ditches with emergent vegetation and standing water. The area has historically used the Conway 2011 *Standardized National Marsh Bird Survey Protocol*, so these protocols were used in lieu of the USFWS 2017 *Yuma Ridgway's Rail Survey Protocol*. Per the USFWS 2017 protocol, "To help survey efficiency, if a site has historically used the National Marsh Bird Protocol but is planned for a potential project, the format of the National Marsh Bird Protocol can still be done." (TN251679).

Good rail habitat was identified at several locations within and adjacent to the proposed generating facility. The edges of Morton Bay contain thick patches of cattail interspersed with salt cedar. Based on aerial photographs, a new north-south orientated road was constructed between Feb 2019 and April 2020, which connects McDonald Road and North Lateral west of Davis Road. The west side of this road is an irrigation canal with patches of cattail. The areas between P Drain south to McDonald Road contain old ponds with good rail habitat consisting of cattails and salt cedar. The northwest pond provided potential habitat for Yuma Ridgway's rail; the southwest pond had varying levels of water but was mostly bare ground; and the northeast pond was bare, with no water present. The property south of W Schrimpf Road is a seasonally flooded pond managed for waterfowl hunting (CDFW Imperial Wildlife Area, Hazard Unit). The rail surveys were conducted outside of the hunting season, and therefore most of the ponds were drained except the pond bordering W Schrimpf Road and ponds in the center of the property along Brandt Road (TN251679).

A total of seven Yuma Ridgway's rails at five different survey point locations were detected in the project area during the first round of surveys. During the second round of surveys, 13 Yuma Ridgway's rails were detected at nine survey locations. A total of 12 individuals were detected at six of the Morton Bay survey locations during the third round of surveys. Overall, Yuma Ridgway's rails were detected at 11 of the 20 survey locations, including the edges of Morton Bay and Hazard Tract south of W Shrimpf Road. Additional marsh bird species detected at the Morton Bay site during the surveys including Virginia rails (*Rallus limicola*), least bitterns (*Ixobrychus exilis*), common gallinules (*Gallinula galeata*), pied-billed grebes (*Podilymbus podiceps*), and American coots (*Fulica americana*). Black rail (*Laterallus jamaicensis*) was not detected during the surveys (TN251679).

Burrowing Owl. The applicant contacted CDFW regarding the approach to conducting burrowing owl surveys as the applicant had missed the survey window for this species. CDFW supported a survey protocol deviation from the CDFW 2012 *Staff Report on*

Burrowing Owl Mitigation to understand local abundance and distribution, to evaluate impacts, and develop appropriate mitigation measures (TN251204). The survey encompassed the proposed project disturbance areas of all three geothermal projects that constitute potential burrowing owl breeding habitat plus a 656-foot (200-meter) buffer. The 656-foot (200-meter) buffer was recommended by CDFW to identify burrows that may require construction avoidance buffers. A total of 3,521 acres (1,425 hectares) was surveyed for proposed project (TN254834).

The CDFW 2012 *Staff Report on Burrowing Owl Mitigation* guidelines define three levels of analysis: habitat assessment, occupancy determination, and impact assessment. The first two portions of that analysis (habitat assessment and occupancy determination) were completed during surveys conducted the applicant in February and March 2022. The focus of this survey was to assess potentially suitable wildlife habitat and record observed wildlife species in the vicinity, especially burrowing owls (TN252791; TN254834).

The third (impact analysis) completed during surveys conducted in 2023 and was a hybrid between the CDFW 2012 *Staff Report on Burrowing Owl Mitigation* guidelines and guidance from CDFW staff. The applicant conducted four impact evaluation, two surveys during the breeding season (February 1-August 31), one survey during the peak breeding season (April 15-July 15), and one during the non-breeding season (September 1-January 31). Surveys were performed by visually scanning the survey area, aided by scopes or binoculars, and listening for burrowing owl vocalizations (when applicable). Due to the known resident populations of burrowing owls in Imperial County agricultural lands, the biologists did not conduct point counts or use calls for surveys (TN252791; TN254834).

Burrowing owls were observed within the project site during wildlife reconnaissance-level surveys and are present throughout the vicinity of the project. A total of 70 occupied burrowing owl burrows were documented within the survey area for all 3 geothermal projects in June, July, August, and November. Many of the burrows were along and underneath the edges of concrete canals and soil drains. All occupied burrows were recorded. A total of 36 incidental burrowing owls were also observed (TN252791; TN254834).

Aquatic Resources

The applicant queried the USFWS National Wetlands Inventory and USGS National Hydrography Dataset to determine the location of potential wetlands and other water resources within the project area (TN249723). A map of irrigation drains and canals operated and managed by the IID also was consulted. Wetlands and watercourses associated with IID drains and canals were excluded from the delineation because they would not be impacted by project implementation. An aquatic resources delineation was conducted in March 2022 on the following dates: March 1, 2, and 11-14. The delineation was conducted within 1,665.56-acres that included the project study area. IID operated drains and canals were excluded because they would not be impacted by project implementation.

The survey was conducted in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), the *Ordinary High-Water Mark (OHWM) Regulatory Guidance Letter No. 05-05* (USACE 2005), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0* (USACE 2008), *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008), and the *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Curtis and Lichvar 2010). The boundaries of features potentially under FGC Section 1600 jurisdiction were delineated using *Methods to Describe and Delineate Episodic Stream Processes on Arid Landscapes for Permitting Utility-scale Solar Power Plants* (Brady and Vyverberg 2014) and *A Review of Stream Processes and Forms in Dryland Watersheds* (CDFG 2010). Wetland indicator statuses for plants were taken from the National Wetland Plant List, version 3.4 (https://nwpl.sec.usace.army.mil/). The aquatic resource delineation identified approximately 18.148 acres of wetlands (two palustrine emergent and three palustrine scrub-shrub), 34.341 acres of other waters (two salt flats, an excavated salt flat, an excavated pond, an excavated lake, and Morton Bay) and 1.416 acres (1,598 linear feet) of watercourses (one perennial and one intermittent) in the study area, finding no aquatic resources within potential disturbance areas. Documentation of the aquatic resource delineation is provided in Appendix 5.2C (TN249723; TN252694).

Previously disturbed wetlands now with dead vegetation, which was categorized under the Disturbed with Vegetation land type, was mapped in the northwest corner of the project area buffer adjacent to Morton Bay. IID constructed the O-N Drain Connector project, which consisted of the construction of drain banks to connect IID's "O Drain" toward IID's "N Drain" in a north-to-south direction; and installing a pipeline to connect the drains under the existing roadway. The project resulted in direct and indirect impacts to wetlands and severed the intermittent hydrological connection from those wetlands to Morton Bay, which drain to the Salton Sea (EPA Docket No. CWA-309[a]-22-002; TN254015). A map of the impacted wetlands is shown in Exhibit A of the EPA Docket. Per Exhibit B of the EPA docket, IID is required to prepare a Restoration Plan for EPA review and approval that involves removal of fill that directly impacted those wetlands and restoration of hydrology to indirectly impacted wetlands.

The Salton Sea is considered by the U.S. Army Corps of Engineers as a Traditional Navigable Waterway (TNW) that is currently and/or historically utilized in interstate and/or foreign commerce, and thus is considered waters of the U.S. (WOTUS). Canals and drains that flow to the Salton Sea would be considered a paragraph (a)(3) jurisdictional tributary if those features are "relatively permanent" and have a hydrological connection to the Salton Sea. However, agricultural ditches may be exempt from being WOTUS if they would "revert to dry land if the irrigation ceased" (33 CFR 328(b)(4)). Other land cover types that meet all three wetland criteria (hydric vegetation, hydric soils, wetland hydrology) would be considered paragraph (a)(4) jurisdictional wetland (33 CFR 328(a)(4)) if they have a continuous surface connection with a WOTUS feature. This

would include communities along the edge of the Alamo River or within the shoreline of the Salton Sea.

All WOTUS are also considered waters of the state (WOTS) under the jurisdiction of the State or Regional Water Quality Control Board (Water Board). Additionally, the Porter-Cologne Water Quality Act (California Water Code), Division 7, section 13050 defines waters of the state as "any surface water or groundwater, including saline waters, within the boundaries of the state". All the canal, drain, and ditch features within the project site are likely to be subject to jurisdiction as the Porter-Cologne definition of waters of the state is very broad, regardless of whether they are cement-lined or not. Mapped tamarisk thickets and cattail marsh areas are likely to be regulated by RWQCB as wetland waters of the state.

The project site is not located within a 100-year floodplain (TN249723). Based on a review of Google Earth Pro images from 1985 to 2023, the location of the production wells adjacent and north of the plant site, and a portion of the plant site itself, have historically and episodically been inundated. The applicant is in the process of requesting a Letter of Map Revision (LOMR) to remap the area because of extensive changes in the Salton Sea elevation in recent years.

During a meeting with IID and CEC staff, IID stated that terminus of drains that are no longer managed may intentionally be flooded, which results in vegetation growth and additional spread of water. These drains once flowed to the Salton Sea, but as the sea levels have declined, drainage connections to the sea have dried. Areas that are currently inundated at the terminus of canals would likely continue to be inundated, though they are not expected to increase in size. This is particularly true of drains that terminate in the Morton Bay and Black Rock areas, which may periodically flood until the drains are fixed. Flow to these areas depends on current demands elsewhere, and IID is not currently obligated to deliver water to canals and drains where termination has resulted in flooding.

Thresholds of Significance

There are no applicable methodology or additional thresholds of significance applicable to this project.

Conditions of Certification / Mitigation Measures

This CEQA analysis evaluates biological impacts resulting from all aspects of the project. Whenever impacts are identified, staff has recommended conditions of certification (COC), identified as **BIO-x**, to reduce impacts from the MBGP site and related facilities to less than significant levels. These conditions are recommended for adoption as mitigation measures (MM) to be used by the County and other governmental entities to reduce impacts to biological resources associated with project components outside of CEC's jurisdiction. The measures are collectively referenced as COC/MM. Table 5.2-7 provides a summary of recommended measures for project components that fall under CEC's license and those that fall under local or other jurisdictions.

5.2.2.2 Direct and Indirect Impacts

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

Construction

Less Than Significant with Mitigation Incorporated. The discussion below outlines potential direct and indirect impacts to plants, invertebrates, fish, amphibians and reptiles, birds, and mammal species. Impacts to these species would be considered significant under CEQA. Impacts from operations, including hazardous material spills, exposure to brine and other ponds, exposure to geothermal atmospheric flash system, collisions with gen-tie lines, night lighting, increased levels of human presence, operational noise, inundation of production well pads, nitrogen emission and deposition impacts, and decommissioning are discussed under the Operation/Decommissioning section. A combination of applicant proposed measures, USFWS and CDFW proposed measures, and CEC staff proposed measures have been included to reduce impacts to less than significant.

Plants

The proposed project would not affect State or federally listed threatened or endangered plants. No federal or state listed plant species were identified during the literature review or during protocol-level botanical surveys conducted by the applicant. Based on habitat conditions in the project area, State or federally listed plants are not expected to occur. The site may provide habitat for other special-status species. Special status plant species that were evaluated in this analysis are listed in Table 5.2-1.

The proposed project has the potential to result in direct and indirect impacts to four special-status plants that have a low potential to occur in the project area. These include Salton milk-vetch (*Astragalus crotalariae*), Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*), Cooper's rush (*Juncus cooperi*), and dwarf germander (*Teucrium cubense* ssp. *depressum*). None of these species were observed during the botanical surveys but could occur in adjacent habitat outside the survey area.

The March botanical survey conducted by the applicant was outside the typical blooming period of Southwestern spiny rush (May-June), though this species can bloom as early as March (CNPS 2024); and outside the blooming period of Cooper's rush (April-May). It is possible these species may have been overlooked. However, the most likely locations for these species to occur, if present, would be along the edge of the riparian and marshland habitats.

Except for dwarf germander, which has a CRPR of 2B.2 and would be considered rare if detected, the other plants have a CRPR of 4. CRPR List 4 plants are characterized by

limited distribution or are infrequently distributed throughout a broader area; therefore, there is a low vulnerability or susceptibility to threat within the state (CNPS 2020). Plants included on CRPR List 4 do not clearly meet CEQA standards and thresholds for impact considerations as they generally do not meet the CEQA Section 15380 guidance criteria for listing as rare, threatened, or endangered. However, CNPS and CDFW recommend that CRPR List 4 plants be evaluated in a CEQA analysis for several reasons, including if the taxa may be more common in some regions but rare in others (CNPS 2020).

Because CRPR List 4 plants are not considered rare in the region and were not detected during the surveys, the removal of a small number of plants (i.e., a few individuals or less than 10 percent of the total occurrence), if present, would not jeopardize the overall occurrence of the plant region-wide and/or would not result in a trend towards further listing or increased protection status. Therefore, impacts to Southwestern spiny rush, Salton milk-vetch, and Cooper's rush, if present, would be considered less than significant. Impacts to dwarf germander, if present would be considered significant. Most of the project area consists of agricultural or highly disturbed lands. If present, dwarf germander could occur in native scrub habitats such as the iodine bush scrub community. To reduce impacts to less than significant, staff proposes Condition of Certification/Mitigation Measure (COC/MM) **BIO-1** (Protocol Botanical Surveys), which would require botanical surveys in native habitats prior to any ground disturbance. **BIO-1** applies as a COC to project components that fall under CEC's license and as an MM for project components requiring permits by local or other jurisdictions.

During construction the applicant may use herbicides to control weeds. The applicant has mentioned the potential use of rodenticides and herbicides and indicated their use would be developed in consultation with the agencies and CEC staff. If used near rare plants these species could be subject to mortality or damage from direct contact or overspray. However, rare plants were not found in the project area, and direct impacts to these species are not anticipated. To ensure impacts to rare plants, if present, are minimized, staff proposes **BIO-2** (Pesticide Application Requirements) which would require licensed applicators and employing best management practices during herbicide use. The applicant would only use herbicides and best management practices that have been approved by CEC and CDFW for use based on evaluations of toxicity, solubility, soil adsorption potential, and persistence in water and soil. In addition, the applicant would use employees or contractors with required applicator licenses/certificates to apply herbicides. **BIO-2** applies as a COC to project components that fall under CEC's license and as an MM for project components requiring permits/authorizations by local or other jurisdictions. With the implementation of COC/MM, potential impacts to rare plants would be reduced to less than significant.

Wildlife

There are a variety of common and special status species known to occur in the project area and in the areas surrounding the Salton Sea. See Table 5.2-2 for the special-status wildlife species that were considered in the analysis for this project.

Invertebrates

Monarch butterflies and Crotch's bumble bee have the potential to occur in the project region but have limited potential to occur near project disturbance areas.

Crotch's bumble bee. Crotch's bumble bee (*Bombus crotchii*) is found in a variety of vegetation communities, including grassland, scrub, chaparral, woodlands, and semi-natural areas with native floral resources. The Salton Sea is within the current range of this species, though the agricultural area south of the Salton Sea is within the historic range. CDFW 2023 *Survey Considerations for CESA Candidate Bumble Bee Species* (CDFW 2023b) recommend evaluating the potential for presence through occurrence database searches and conducting a habitat assessment.

There are no observations of Crotch's bumble bee in Bumble Bee Watch (BBW); however, the BBW began in 2022 and currently only includes one year of surveys (BIOS). (https://apps.wildlife.ca.gov/bios6/?bookmark=327). There is one historic CNDDB record of Crotch's bumble bee approximately 11.25 miles south of the project area, which is based on a 1948 collection in the vicinity of Brawley. No additional information is provided. There are no additional CNDDB records around the Salton Sea. Similarly, there are no iNaturalist records in the vicinity of the Salton Sea. However, there are recent iNaturlist records of this species north of the Salton Sea near Indio.

Although these records indicate the species has not been identified in Imperial County in several decades, the project area is within the known range of the species. As more robust data is currently being collected across the state of California through programs like the Bumble Bee Atlas, the distribution of this species will be better understood. As such, there is a low potential for Crotch's bumble bee to occur in low numbers throughout the project area.

Direct impacts to Crotch's bumble bee, if present, could include the loss or modification of foraging and nesting habitat, the disturbance or destruction of occupied nesting sites, and exposure of individuals and/or nesting sites to human disturbance, fugitive dust, ground vibration, and other hazardous materials. Indirect impacts could include the loss or degradation of habitat from invasive weeds.

Staff conducted a desktop bumble bee habitat assessment to evaluate the percentage of the project area that supports natural habitat, available foraging resources, nesting and overwintering habitat, and areas with active management and pesticide practices. Based on a review of aerial photographs, applicant data and photos, and the site visit, most of the project site does not provide natural habitat and foraging resources for Crotch's bumble bee. Approximately 93 percent of the project site contains agricultural lands, canals, and drains, developed, and disturbed habitat. Vegetation on these lands is managed through crop rotation, tilling, mowing or other management activities. The remaining 7 percent includes semi-natural tamarisk thickets, cattail marsh, and iodine bush scrub. These communities generally do not provide the variety of native floral resources to support this species. Crotch's bumble bee prefer smaller flowers that are

abundant with pollen and nectar, such as milkweed (*Asclepias* spp.), chaenactis (*Chaenactis* spp.), deerweed (*Acmispon* sp.), buckwheats (*Eriogonum* sp.), lupines (Lupinus spp.), clovers (*Medicago* spp.), phacelias (*Phacelia* sp.), and sages (*Salvia* spp.), which do not occur in abundance in the project area. However, the foraging and dispersal range of bumble bees varies, and this species has been seen in patchy agricultural landscapes up to 11.5 kilometers (7.14 miles) from natural habitats, though foraging ranges is typically 1-2 km (0.6-1.24 miles).

The project area does provide some potential nesting and overwintering habitat for this species should they occur in adjacent lands. Small mammal burrows, cavities along irrigation canals, and natural areas with woody cover, brush piles, or leaf litter could provide overwintering habitat. However, the presence of these features should be tempered with the ongoing agricultural practices in the area. However, if this species occurs in the project area, any loss or disturbance to individuals or nesting colonies would be considered a significant impact.

To reduce impacts to Crotch's bumble bee, staff proposes **BIO-3** (Bumble Bee Avoidance Measures), which would require identifying suitable habitat for Crotch's bumble bee within the project area, surveying those areas for active nesting sites, and avoiding active nesting sites. **BIO-3** applies as a COC for project components that fall under CEC's license and as an MM for project components requiring permits/authorizations by local or other jurisdictions.

Staff proposes modifications to applicant's measures (TN249723, AFC Section 5.2.3.1.1-5.2.3.1.4, 5.2.3.1.6-5.2.3.1.9 and 5.2.3.1.14) based on guidance provided by CDFW and to include clarifying language. These have been incorporated into staff's proposed **BIO-4** (General Conservation Measures), which includes conservation measures during construction such as restricting activities to defined work areas and access routes; **BIO-5** (Worker Environmental Awareness Program) to train contractor personnel on biological resources at the site; and **BIO-6** (Designated Biologist(s) (DB) and Biological Monitor(s)), **BIO-7** (Conduct Pre-Activity Surveys for Special-Status Wildlife), and **BIO-8** (Biological Construction Monitoring) which would require the approval of DB and monitors, biological pre-activity surveys, and routine monitoring of sensitive biological resources. These measures would apply as COC to project components that fall under CEC's license and as MM project components requiring permits/authorizations by local or other jurisdictions.

To reduce impacts from fugitive dust, staff proposes dust control measures **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement), as described in **Section 5.1 Air Quality**, as part of air quality requirements that would reduce potential impacts to this species from dust. With the implementation of these COC/MM, impacts would be reduced to less-than-significant.

Monarch butterfly. Monarch butterfly (*Danaus plexippus plexippus* pop. 1) is a candidate for federal listing. Although, species designated as federal candidates for listing do not receive full protection under the FESA, take would only be authorized under the context of the appropriate permits issued by USFWS if the species is officially designated as

federally threatened or endangered prior to implementation of the project. Direct impacts to monarch butterflies could include crushing from humans or equipment, or exposure to fugitive dust.

The abundance and migratory behavior of monarch butterflies are a product of the diversity and abundance of larval milkweed host plants of the genus *Asclepias* (Malcolm, 2018). During the breeding season, monarch butterflies lay their eggs on their obligate milkweed host plant which provide toxins to protect them from predation. Larvae emerge after two to five days and develop while feeding on the milkweed host plant. Individual monarch butterflies in California undergo long-distance migration between spring and summer breeding grounds and overwintering sites primarily along the central coast in California. Surviving adults' mate at overwintering sites in the spring before dispersing back to breeding grounds.

Monarch butterfly roosts in wind-protected tree groves, primarily preferring eucalyptus trees (*Eucalyptus* spp.) and pine trees (*Pinus* spp.), but also use fir trees (*Abies* spp.), cypress trees (*Cupressus* spp.) and oak trees (*Quercus* spp.). The project site does not support suitable habitat for monarch butterfly roosting sites and the project site is outside of the known overwintering range for the species. Monarch butterfly does occur as a migrant that moves through the area to preferable overwintering sites along the coast.

Monarch butterfly larvae require milkweed species (*Asclepias* sp.) as their host plant as adult monarchs breed along their migration route (Jepson et. al 2015). Milkweed plants were not identified in or adjacent to the project site during the biological surveys and impacts to larval monarchs is not expected to occur. In addition, most of the proposed project site has been subject to historic and ongoing disturbance including agricultural practices which would limit the presence of milkweed host plants for monarch butterfly.

This species could occur in the region as a migrant during construction. Monarch butterflies are diurnal migrants, meaning they migrate during the day. At night, migratory individuals roost on trees or shrubs and often form large groups of butterflies. Monarch butterflies could roost in riparian vegetation or tamarisk trees that occur along some of the canals however this habitat is extremely limited, and the species is not expected to linger is areas supporting limited foraging habitat. Though most of a monarch's moisture comes from nectar, monarchs will take small drinks from shallow water areas or muddy soil. Butterflies could be attracted during dust suppression or water along the many small canals in the region. If present in adjacent habitat these species could be exposed to fugitive dust.

Based on the limited habitat and absence of required larval host plants, impacts to this species would be considered less than significant and no mitigation is required. Nonetheless, should the species occur in the project area as a transient, construction-related impacts would be reduced by mitigation requirements proposed for Crotch's bumble bee that include measures to control dust, limit disturbance to approved areas, and worker training. These include **BIO-4** (General Conservation Measures), **BIO-5** (Worker Environmental Awareness Program), **BIO-6** (DB(s) and Biological Monitor(s)),

BIO-7 (Conduct Pre-Activity Surveys for Special-Status Wildlife), and **BIO-8** (Biological Construction Monitoring); and **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement) as described in **Section 5.1 Air Quality**. Although not required for this species these measures would reduce or avoid impacts to this species should it occur in the project area during construction.

Fish

Desert pupfish (*Cyprinodon macularius*) are known to occur in the project area and appear to be primarily restricted to IID managed drains, canals, and other channels. The applicant met with CDFW and USFWS where the agencies confirmed that desert pupfish surveys are not required because the presence of desert pupfish is presumed (TN250679). Desert pupfish occupied drains in the project area include east-west irrigation canals along Hazard Road, McDonald Road, and Sinclair Road; parallel to east-west Cox Road/Gentry Road between Garst Road and Rock Hill; and north-south irrigation canals along Cox Road/Lindsey Road, Boyle Road, Severe Road, Crummer Road, and Lack Road (TN251680 Figure DA 5.2-1). Red Hill Bay Drains, which occurs between Garst Road and Rock Hill, is an important area for desert pupfish. A survey in the end of May 2023 yielded over 400 desert pupfish, mostly juveniles, in the main connector channel of the Red Hill Bay Drains.

Razorback sucker (*Xyrauchen texanus*) is native to large warm-water portions of the Colorado River basin. There are historic CNDDB records for this species in the Alamo River draining to the Salton Sea and East Highline Canal; however, the project area is outside the current range of this species. Though this species is not expected to occur within the project area, ongoing recovery efforts could lead to an expansion into its historic range.

Based on GIS data provided by the applicant there would be temporary/permanent impacts to approximately 18.95/1.03 acres of canals or drains, however there is conflicting information if these features would be avoided. The applicant stated that the project would not directly impact any IID canals or drains that could support pupfish, and therefore are not expected to result in direct mortality or injury, or impediments to movement. The applicant indicated these features would be crossed with above ground pipes. project features were specifically located to avoid impacts to aquatic resources, such as irrigation supply and drain canals, the Alamo River, and the Salton Sea where desert pupfish and razorback sucker could occur. The irrigation and drain canals represent a major part of the IID's operational infrastructure and impacts to these features could affect their ability to service their customers (TN254015).

During May/June 2023 email correspondence with the applicant (TN250679), CDFW states that the Red Hill Bay Drains are an important habitat for desert pupfish. CDFW stated they believed that these are inactive remnant drains and provided a map of their approximately location. CDFW also stated that a survey in the end of May 2023 yielded over 400 desert pupfish, mostly juveniles, in the main connector channel of the Red Hill Bay Drains. The Red Hill Bay Drains connect to canals along Garst Road, in an area identified by the applicant as Tamarisk thickets, and flows toward the Salton Sea. Based

on current aerial photographs, much of the drain between Garst Road and the Salton Sea is currently dry, which would currently restrict movement of desert pupfish into the Salton Sea. The project features are outside of this area.

Desert pupfish are assumed to be present in the canals along Hazard Road, on the north side of the production wells, and along McDonald Road, along the north side of the plant location. If dewatering of desert pupfish aquatic habitat is needed due to a high rainfall year, it would be considered a significant impact. Direct impacts could occur if fish were exposed to pipeline and well infrastructure during a flood event that results in entrapment and mortality. Pipelines and gen-tie lines that are constructed over canals and drains and the Alamo River that provide habitat for fish species could result in reduction in water quality from accidental spills of hazardous materials and wastes and exposure to fugitive dust, and vibration from pipe and pole infrastructure installation. Indirect impacts could include long-term alterations to hydrology and degradation of habitat from the introduction and proliferation of noxious and invasive weeds. Long-term modifications that reduce natural flows to downstream habitats could result in the displacement of riparian vegetation and degradation of various habitat types that are used throughout different life stages.

Alterations to agricultural fields that return flow to canals and drains could have an indirect impact on vegetation and hydrology. Figure DRR-272 (TN254603) provides the direction of agricultural return flows for the construction of the plant site. Flows are typically directed toward the Salton Sea; the remaining being directed to canals and drains that either flow to the Alamo River or the Salton Sea. Reduced agricultural return flow associated with the project, and how it would affect desert pupfish habitat and vegetation communities, is currently underway with IID as part of the Water Supply Agreement and impact study analysis (TN254015; TN254603). However, annual flow in the canals and drains depends on IID water demands and is complicated by declines in water in the area due to climate fluctuations, agricultural conservation measures, cropping practices, and decrease inflows from Mexico. Though a conversion of one parcel to agricultural use may result in a small decline in agricultural drainage, that decline on water use is minimal. As such, indirect alterations to hydrology due to conversion of agricultural is considered less than significant.

There is a high occurrence of invasive species within the project area, particularly within the canals and drains and tamarisk thickets communities that support aquatic vegetation. These areas are subject to historic and ongoing disturbance from agricultural land use, irrigation, and existing geothermal facilities. The Refuge actively manages invasive salt cedar and sesbania (*Sesbania punicea*), which thrive in moist soil. Though several communities are dominated by invasive species, spread of these or other invasive species into native habitat would be considered a significant impact. The introduction and spread of invasive weeds can have detrimental effects on riparian habitat and aquatic systems. Indirect impacts would occur if new sources of weeds (i.e., seeds or plant parts) are introduced into the project site or are allowed to spread due to ground disturbance activities. If allowed to proliferate, new weed sources could further reduce the quality of

habitat, or spread to communities that support more native vegetation, such as the cattail marsh. Invasive weeds can be introduced and spread through transport on uncleaned vehicles and equipment moving from areas within the project area or from areas outside of the general region.

Impacts to fish can also occur through the introduction or spread of invasive wildlife or pathogens. This typically occurs when equipment or vehicles are used in infested areas and not cleaned prior to moving to new locations. New Zealand mudsnails (*Potamopyrgus antipodarum*), Quagga Mussel (*Dreissena rostriformis bugensis*), or Zebra Mussel (*Dreissena polymorpha*) were not found during the surveys. Quagga mussels, an invasive mussel that can colonize freshwater surfaces, was found in the Colorado River at Imperial Dam in Imperial County in 2008 (CDFW 2021; CDFW 2024g). Quagga mussels can spawn multiple times a year and consume large quantities of plankton that form the base of the food web, outcompeting native species.

New Zealand mudsnails are tiny, aquatic snails which grow up to 4-6 mm (0.1-0.2 inches) long and are found on a wide variety of substrates and vegetation in fresh and brackish lakes, rivers, streams, and estuaries. They are tolerant of turbidity, siltation, and poor water quality, can reproduce in brackish water, and survive in full saltwater for a short time. They do not appear to be present in the project area but are found in many rivers and lakes in California. The spread of these or other invasive species into native habitat could result in adverse impacts to native fish and amphibian species. Any introduction of these species into the project area would be considered a significant impact.

To reduce impacts to desert pupfish, staff proposes implementation of USFWS measure **BIO-9** (Desert Pupfish Protection and Relocation Plan), which would require the preparation of a Desert Pupfish Protection and Relocation Plan if dewatering is needed in pupfish habitat during construction or operation activities. The plan would include protocols for determining pupfish presence, capture, relocation, and monitoring; and be submitted to USFWS and CDFW for review and comment prior to implementation. Since the project is not anticipated to impact canals and drains that fall under CEC's license, **BIO-9** is included as a MM for construction of the well pads under the authority of local or other jurisdictions.

In addition, staff proposes modifications to applicant's measures (TN249723, AFC sections 5.2.3.1.1-5.2.3.1.4, and 5.2.3.1.8-5.2.3.1.9) based on guidance from CDFW and to include clarifying language. These have been incorporated into staff's proposed **BIO-5** (Worker Environmental Awareness Program) to train contractor personnel on biological resources at the site; and **BIO-6** (DB(s) and Biological Monitor(s)), **BIO-7** (Conduct Pre-Activity Surveys for Special-Status Wildlife), and **BIO-8** (Biological Construction Monitoring) which would require the approval of DBs and monitors, biological pre-activity surveys, and routine monitoring of sensitive biological resources.

Given that the applicant has included design measures to avoid potential impacts to canals and drains, and the use auger cast piles instead of impact or vibratory pile driving to eliminate the potential for hydroacoustic impacts to desert pupfish (TN250679), these

have been incorporated into staff's proposed **BIO-4** (General Conservation Measures). This measure would apply to currently active IID canals and drains, as well as canals and drains that have been abandoned but could still convey water to the Salton Sea, such as the inactive remnant drains identified by CDFW at the untapped well pad, to ensure there would be no disruption of drains from conveying flows in the future. **BIO 4** also incorporates applicant's measure (TN249723, AFC Section 5.2.3.1.6) that would require access, parking, staging, and refueling outside of aquatic habitat. In addition, to reduce the spread of invasive weeds, this measure would incorporate applicant's measure for weed management (TN250679) by requiring vehicles to be cleaned and free of mud and debris, and erosion control measures be certified weed free and invasive animal free.

In addition, staff proposes modifications to applicant's weed measures (TN250679) by adding control of aquatic invasive species, specifying the areas that would require revegetation, adding restoration techniques, and including verification requirements. These modifications have been incorporated into staff's proposed **BIO-10** (Invasive Species Management Plan) and **BIO-11** (Closure, Revegetation, and Rehabilitation Plan), which would manage weeds, restore disturbed areas with native or sterile non-native species, and reduce cultivation of invasive species on temporarily disturbed soils. Since ingress and egress to permanently disturbed areas can provide an avenue for the spread of invasive weeds, **BIO-10** applies as a COC to project components that fall under CEC's license and as an MM for project components requiring permits/authorizations by local or other jurisdictions. **BIO-11** applies to temporarily impacted areas, such as borrow pits, construction camps, and construction laydown and parking areas, which are components outside of CEC's licensing authority. However, applicants GIS data identifies potential temporary impacts from construction of the proposed generating facility. As such, **BIO-11** applies as a COC to project components that fall under CEC's license, as needed, and as an MM for project components requiring permits/authorizations by local or other jurisdictions.

To reduce impacts from fugitive dust, staff proposes dust control measures **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement) as described in **Section 5.1 Air Quality**. To reduce impacts to water resources, staff proposes erosion control COC/MM **WATER-1** (NPDES Construction Permit Requirements) and **WATER-3** (Waste Discharge Requirements) as identified in **Section 5.16 Water Resources**. To reduce construction related materials from entering aquatic features, staff proposes COC/MM **HAZ-1** and **HAZ-2** as identified in **Section 5.7 Hazards, Hazardous Materials/Waste, and Wildfire**, which would require the preparation and approval of a Hazardous Materials Business Plan (HMBP) and a Spill Control Counter Measure Plan (SPCC). With the implementation of the above conditions of approval, impacts to desert pupfish and razorback sucker would be reduced to less than significant.

Amphibians and Reptiles

The proposed project would not affect any federally or state listed amphibians or reptile species. Due to the high salinity of the Salton Sea and the presence of invasive bullfrogs, there is limited diversity of amphibians in the area (USFWS 2024b). However, marshlands

created for Yuma Ridgway's rail can support native amphibian species. CDFW SSC species that have a low potential to occur in the area include Sonoran Desert toad (*Incilius* (=*Bufo*) *alvarius*), lowland leopard frog (*Lithobates* (=*Rana*) *yavapaiensis*), and Couch's spadefoot (*Scaphiopus couchii*). The project area does not provide the large expanse of desert arid land needed for federally listed Mojave Desert tortoise (*Gopherus agassizii*). Areas adjacent to smaller patches of sandy soils could provide habitat for CDFW SSC flat-tailed horned lizard (*Phrynosoma mcallii*), though given the disturbance of the area, the potential for this species to occur is also low. Amphibians rely on aquatic habitats for survival, but also utilize adjacent upland habitat for foraging, basking and dispersal. Couch's spadefoot and flat-tailed horned lizard can also use native upland habitat, particularly soft soils and sandy areas.

Information on the presence of lowland leopard frog in the Salton Sea area generally cite Jennings and Hayes 1994 California survey, where they were determined to be extirpated from the state. However, there have been records of leopard frogs in the area (iNaturalist 2024) and the NWR mentions the species on their website (USFWS 2024b). Based on the *California Amphibian and Reptile Species of Special Concern* (Thomson et. al 2016), this frog is often confused with the closely related, nonnative Rio Grande leopard frog, and there are no extant populations of lowland leopard frog known in California. Leopard frogs have been photographed in 2014 and 2016 in the vicinity of the Salton Sea, within their historical range, some of which were added to iNaturalist (Pauly et. al 2020). However, a morphological and genetic study determined that the observations were a morphologically intermediate frog of nonnative of the Rio Grande leopard frogs (Ibid); therefore, CEC staff concludes that lowland leopard frog has been extirpated from the area.

Although the likelihood of these species being present in the project area is low, impacts to CDFW SSC amphibians and reptiles, if present during construction activities, would be considered a significant impact.

Direct impacts to special status reptile and amphibians could include the loss of individuals from construction activities, disruption of breeding behavior, temporary and permanent loss of habitat, and exposure to hazardous materials. Elevated levels of human presence, noise, vibration, and fugitive dust associated with construction activities could result in displacement of breeding individuals or disruptions of breeding activities. Direct impacts could also result from the release of hazardous materials or wastes into aquatic habitat. Construction activities, including vegetation removal or ground disturbing activities, particularly removal of riparian vegetation, could result in crushing, trampling, or entrapment. Noise from construction activities could result in disturbance to amphibian vocalizations and breeding behavior. Overall, many amphibian species are known to vocalize during the evening and night. Noise-producing activities associated with construction would be localized and temporary in nature and would be primarily conducted during the daytime. Aquatic features provide important breeding habitat for amphibians, and riparian vegetation provide food sources, cover, movement corridors.

Indirect impacts include the loss of habitat due to the colonization of invasive or noxious weeds or wildlife, and more specifically to amphibians, long-term alterations to hydrology. Invasive weeds have various detrimental effects on aquatic, riparian, and upland habitats. They often alter water table depths by tapping into previously unused groundwater resources. They can also outcompete native species by suppressing native recruitment, consuming water and nutrient resources, by shading slower growing plants, crowding out bank and basking habitat, or alter ground cover in arid and semiarid habitats. Additionally, weeds often do not stabilize soils as well as native vegetation, which can lead to degradation of stream channels and water quality from increased erosion and sedimentation.

Long-term alterations to hydrology can include modifications of flow regimes, thermal conditions, and structure of aquatic and upland habitats. Such alterations can also influence soil stability, erosion, and sediment loading to aquatic habitats. Toxic exposure of hazardous materials to amphibians and reptiles can include effects on reproduction, growth, egg hatchability, and juvenile survival.

To reduce these impacts, staff proposes modifications to applicant's measures (TN249723, AFC sections 5.2.3.1.1-5.2.3.1.4, 5.2.3.1.6-5.2.3.1.9 and 5.2.3.1.14) based on guidance provided by CDFW and to include clarifying language. These have been incorporated into staff's proposed **BIO-5** (Worker Environmental Education Program) to train contractor personnel on biological resources at the site; and **BIO-6** (DB(s) and Biological Monitor(s)), **BIO-7** (Conduct Pre-Activity Surveys for Special-Status Wildlife), and **BIO-8** (Biological Construction Monitoring) which would require the approval of DBs and monitors, biological pre-activity surveys, and routine monitoring of sensitive biological resources. **BIO-4** (General Conservation Measures) would require access, parking, staging, and refueling outside of aquatic habitat.

Staff proposes modifications to applicant's weed measures (TN250679) by adding control of aquatic invasive species, specifying the areas that would require revegetation, adding restoration techniques, and including verification requirements. These modifications have been incorporated into staff's proposed **BIO-10** (Invasive Species Management Plan) and **BIO-11** (Closure, Revegetation, and Rehabilitation Plan). These COC/MM would manage invasive species, restore disturbed areas with native or sterile non-native species, and reduce cultivation of weeds on temporarily disturbed soils.

To reduce any noise-related impacts to amphibians or reptiles, staff proposes noise COC/MM **NOISE-4** (Operational Noise Restrictions), **NOISE-5** (Occupational Noise Survey), **NOISE-6** (Construction and Demolition Noise Restrictions), **NOISE-7** (Steam Blow Restrictions), and **NOISE-8** (Pile Driving) as described in **Section 5.9.5 Noise and Vibration**. Though these measures are proposed for human receptors, the adoption of these measures would also reduce impacts to amphibians or reptiles. Specifically, these noise COC/MM would ensure operation of the project would not cause ambient noise levels from power plant operations to exceed 43 dBA, would require an occupations noise study to identify any noise hazardous areas within the generating facility, restrict noisy construction activities to specific timeframes, limit noise from steam blowers through

mufflers or silencers, and require pile driving to be conducted in a manner that reduces noise and vibration.

To reduce impacts from fugitive dust, staff proposes dust control COC/MM **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement) as described in **Section 5.1 Air Quality**. To reduce impacts to water resources, staff proposes erosion control COC/MM **WATER-1** (NPDES Construction Permit Requirements) and **WATER-3** (Waste Discharge Requirement) as described in **Section 16 Water Resources**. To reduce construction related materials from entering aquatic features, staff proposes COC/MM **HAZ-1** and **HAZ-2** as identified in **Section 5.7 Hazards, Hazardous Materials/Waste, and Wildfire**, which would require the preparation and approval of a HMBP and a SPCC. With the implementation of the COC/MM, impacts to reptiles and amphibians would be reduced to less than significant.

Birds

The Salton Sea is within the Pacific Flyway and is a major migratory route for a wide variety of birds. Many resident and migratory birds use the area for nesting and/or foraging due to the abundant food resources at the Salton Sea, including fish, invertebrates, plants, and seeds. These include federally or state listed birds, fully protected (FP) species, and species of special concern (SSC). Native bird species are also regulated by the Federal Migratory Bird Treaty Act (MBTA) and Fish and Game Code (FGC) Section 3503. Species designated by CDFW as Watch List (WL) species or by USFWS as Birds of Conservation Concern (BCC) do not typically warrant protections under CESA. However, these birds would be protected under the MBTA and FGC. Given the diversity of birds that utilize the Salton Sea and surrounding landscape, this analysis acknowledges the potential for a high diversity of birds to occur in the area, and many species could visit the area as a transient or seasonal migrant. Virtually any bird that migrates along the Pacific flyway has some potential to occur either as a migrant, forager, or local breeder.

The following special-status bird species were considered for this analysis as having a moderate or higher potential to nest and forage in the project area:

- Burrowing owl (*Athene cunicularia*) – CDFW SSC
- Redhead (*Aythya americana*) – CDFW SSC
- Western snowy plover (*Charadrius nivosus nivosus*) – Federally threatened, CDFW SSC
- Northern harrier (*Circus hudsonius*) – CDFW SCC
- White-tailed kite (*Elanus leucurus*) – CDFW FP
- Southwestern willow flycatcher (*Empidonax traillii extimus*) – Federally endangered, State endangered
- Gull-billed tern (*Gelochelidon nilotica*) – CDFW SSC
- Yellow-breasted chat (*Icteria virens*) – CDFW SSC

- Least bittern (*Ixobrychus exilis*) – CDFW SSC
- Loggerhead shrike (*Lanius ludovicianus*) – CDFW SSC
- California black rail (*Laterallus jamaicensis coturniculus*) – State threatened, CDFW FP
- Gila woodpecker (*Melanerpes uropygialis*) – State endangered
- California brown pelican (*Pelecanus occidentalis californicus*) – Federally and State delisted (historical breeding populations at Black Rock)
- Yuma Ridgway's rail (*Rallus obsoletus yumanensis*) – Federally endangered, State threatened, CDFW FP
- Black skimmer (*Rynchops niger*) – CDFW SSC
- Yellow-headed blackbird (*Xanthocephalus xanthocephalus*) – CDFW SSC

The following special-status bird species are known winter residents at the Salton Sea, and were considered for this analysis as having a moderate or higher potential to forage in the project area, but are not known to nest in the area:

- Lesser sandhill crane (*Antigone canadensis canadensis*) – CDFW SSC
- Greater sandhill crane (*Antigone canadensis tabida*) – State threatened, CDFW FP
- Short-eared owl (*Asio flammeus*) – CDFW SSC
- Brant (*Branta bernicla*) – CDFW SSC
- Swainson's hawk (*Buteo swainsoni*) – State Threatened
- Mountain plover (*Charadrius montanus*) – CDFW SSC
- Black Tern (*Chlidonias niger*) – CDFW SSC
- Olive-sided flycatcher (*Contopus cooperi*) – CDFW SSC
- Little willow flycatcher (*Empidonax traillii brewsteri*) – State endangered
- American peregrine falcon (*Falco peregriunus anatum*) – Federally and State delisted
- Bald eagle (*Haliaeetus leucocephalus*) – State endangered, CDFW FP
- Wood stork (*Mycteria americana*) – CDFW SSC
- Large-billed savannah sparrow (*Passerculus sandwichensis rostratus*) – CDFW SSC
- American white pelican (*Pelecanus erythrorhynchos*) – CDFW SSC
- Yellow warbler (*Setophaga petechia*) – CDFW SSC

CDFW WL species that are known to occur or could occur in the Salton Sea area include Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), merlin (*Falco columbarius*), gray-headed junco (*Junco hyemalis caniceps*), California gull (*Larus californicus*), laughing gull (*Leucophaeus atricilla*), double-crested cormorant (*Nannopterum auritum*), long-billed curlew (*Numenius americanus*), osprey (*Pandion*

haliaetus), white-faced ibis (*Plegadis chihi*), and black-tailed gnatcatcher (*Polioptila melanura*).

USFWS BCC species that are known to occur or could occur in the Salton Sea area include burrowing owl (*Athene cunicularia*), Costa's hummingbird (*Calypte costae*), mountain plover (*Charadrius montanus*), black tern (*Chlidonias niger*), northern harrier (*Circus hudsonius*), olive-sided flycatcher (*Contopus cooperi*), gull-billed tern (*Gelochelidon nilotica*), California gull (*Larus californicus*), American white pelican (*Pelecanus erythrorhynchos*), American avocet (*Recurvirostra americana*), Rufous hummingbird (*Selasphorus rufus*), Bendire's thrasher (*Toxostoma bendirei*), and Le Conte's thrasher (*Toxostoma lecontei*).

Common Protected Birds. Native birds are regulated by the MBTA and FGC Section 3503. These regulations also protect federally or state listed birds, fully protected birds, bird species of special concern, watch list bird species, and birds of conservation concern. The loss of native and migratory bird species would be considered a significant impact.

Direct impacts to nesting birds could include destruction of nests or eggs or disruption of breeding behavior due to ground-disturbing activities associated with construction of project facilities and increased human presence. Direct impacts to bird species could also occur because of vehicle strikes if birds are flushed from hiding sites along the rural access roads; degradation of nesting or foraging habitat; and if breeding territories were abandoned due to increased levels of human presence, noise, vibration, and fugitive dust. Indirect impacts could include the loss of habitat due to the colonization of invasive or noxious weeds and long-term alterations to supporting habitat.

Some species of birds could nest adjacent to the project site along the canals and where native vegetation is present during construction. Depending on the species, birds may also actively nest on the ground close to equipment or even on idle construction equipment. In southern California, birds have been documented nesting on vehicles, foundations, construction trailers, and equipment left overnight or during a long weekend. In areas where construction may be phased, birds may quickly utilize these features as nest sites. Cavity nesting birds may use pipes and other construction materials for nesting. Many of the birds that would be likely to use these types of nesting substrates are common species such as house finches, phoebes, and doves. However, killdeer is often found associated with gravel parking areas and open fields.

Vegetation removal or ground disturbing activities, including disturbed areas or areas of bare soil, could destroy active nests of eggs if performed during the breeding season. Elevated levels of human presence, noise, vibration, and fugitive dust associated with construction activities could result in the displacement of breeding birds and the abandonment of active nests if activities are conducted during the breeding season. Any actions that result in the failure of a nest or the loss of an active nest would be considered a significant impact.

Construction activities would result in the temporary impact of up to 1,150.23 acres and permanent impact of up to 148.45 acres of upland and riparian vegetation communities and other cover types that are known or expected to support breeding, nesting, and foraging birds. Though birds are more likely to nest on natural and semi-natural habitats, such as tamarisk thickets, cattail marsh, and iodine bush scrub, they can also nest in disturbed areas, cavities, and agricultural areas.

The removal of suitable breeding and nesting habitat for avian species would typically be considered a significant impact. A majority of the temporary and permanent impacts, up to 1,150.23/148.45 acres, are within agricultural, barren, developed, or disturbed landscapes that do not provide high quality breeding or nesting habitat for most bird species. However, agricultural areas do provide foraging habitat and are considered regionally important to wildlife in Imperial County. Approximately 588,416 acres (20%) of Imperial County consists of irrigated agricultural fields (Census of Agriculture 2017; see TN254015). The project would result in a temporary loss of approximately 743.28 acres (0.13%), and a permanent loss of approximately 6.18 acres (<0.01%), of agriculture land use. Upon completion of construction, temporarily impacted agricultural fields would revert to previous uses. Impacts to agricultural land which provide foraging habitat for bird species would result in a small reduction compared to the total agricultural lands available in Imperial County. Up to 20.02/17.91 acres of impacts are anticipated in the iodine bush scrub. Most of the canals and drains do not contain vegetation that support bird species, though these areas do support burrows that provide habitat for burrowing owls and other cavity dwelling species. The proposed project would temporarily and permanently impact 5.18/5.43 acres of semi-natural Tamarisk thickets and 20.38/17.42 cattail marsh habitat. Considering the relatively small disturbance within a wide region of available habitat, construction activities are not likely to significantly affect breeding or nesting birds throughout the region. However, construction would be expected to disturb birds on a local scale. Given the diversity of birds in the region, the loss of habitat for protected bird species would be considered a significant impact.

Construction noise can affect birds in a variety of ways. Impacts could include disturbance or disturbance to breeding behavior, such as masking or distorting advertisement calls, inducing a stress response that negatively impacts fitness, or abandonment of nests or young. The Imperial County General Plan Noise Element identifies that many riparian bird species are sensitive to excessive noise and, as such, they are considered a sensitive receptor. The applicant provided a range of range of octave band sound pressure levels from typical construction activities at 50 and 1000 feet that would be generated by project construction equipment (See Tables DR 228-1 and DR 228-2 in TN254015). Several construction activities were listed that range between 34 and 100 hertz (Hz) at 50 feet and -11 and 73 Hz at 1,000 feet. These levels have the potential to disturb birds to some degree.

The Caltrans 2016 *Technical Guidance for Assessment and Mitigation of the Effects of Traffic Noise and Road Construction Noise on Birds* (Caltrans 2016) summarizes existing literature on the effects of traffic noise to bird species. The Caltrans guidance states that

birds are more resistant to hearing loss and auditory damage, but noise may have a more pronounced effect through masking. Birds, like humans and other animals, employ a range of short-term behavioral strategies, or adaptations, for communicating in noise in order to increase efficiency. Though noise impacts to birds would be considered a significant impact, construction related noise impacts would be temporary in nature, and variable in the noise level employed depending on the type of construction equipment being used or the infrastructure being built. The surrounding landscape consists of existing geothermal facilities and agricultural land use that results in on-going noise disturbance as part of ambient conditions including the use of periodic crop dusting by fixed and or rotary wing aircraft. However, long durations of elevated noise levels during construction could result in an impact to bird species.

Construction activities could also result in the introduction and colonization of invasive or noxious weeds. Many avian species are closely associated with or dependent upon specific habitat types and characteristics. If invasive or noxious weeds become introduced and established, they could displace native vegetation that is preferred or obligate habitat for many bird species. Though several communities are dominated by invasive species, spread of these or other invasive species into native habitat would be considered a significant impact.

To reduce impacts to MBTA and FGC protected bird species, the applicant's proposed preconstruction surveys measure (TN249723, AFC Section 5.2.3.1.8) states that the project owner will provide a preconstruction survey protocol in consultation with appropriate agencies. Staff proposes **BIO-12** (Conduct Pre-Activity Surveys for Nesting Birds), which provides survey protocol developed in coordination with CDFW, and is specific to nesting birds. **BIO-12** outlines the approach for nesting bird surveys, monitoring of nesting behavior, implementing buffers around active nests, and defining monitoring and reporting requirements. **BIO-12** applies as a COC to project components that fall under CEC's license and as an MM for project components requiring permits/authorizations by local or other jurisdictions.

Staff proposes modifications to applicant's measures (TN249723, AFC sections 5.2.3.1.1-5.2.3.1.4, 5.2.3.1.6-5.2.3.1.9 and 5.2.3.1.14) based on guidance provided by CDFW and to include clarifying language. These have been incorporated into staff's proposed **BIO-5** (Worker Environmental Awareness Program) to train contractor personnel on biological resources at the site, and **BIO-6** (DB(s) and Biological Monitor(s)), **BIO-7** (Conduct Pre-Activity Surveys for Special-Status Wildlife), and **BIO-8** (Biological Construction Monitoring) which would require the approval of DBs and monitors, biological pre-activity surveys, and routine monitoring of sensitive biological resources. **BIO-4** (General Conservation Measures) would require reduced vehicle speeds, delineation of the work zone, and access, parking, staging, and refueling outside of aquatic habitat.

Staff proposes modifications to applicant's weed measures (TN250679) by adding control of aquatic invasive species, specifying the areas that would require revegetation, adding restoration techniques, and including verification requirements. These modifications have been incorporated into staff's proposed **BIO-10** (Invasive Species Management Plan)

and **BIO-11** (Closure, Revegetation, and Rehabilitation Plan). These COC/MM require vehicles to be cleaned and free of mud and debris, require erosion control measures be certified weed free, would manage weeds, restore disturbed areas with native or sterile non-native species, and reduce cultivation of invasive species on temporarily disturbed soils.

To reduce noise-related impacts to birds, staff proposes **NOISE-4** (Operational Noise Restrictions), **NOISE-5** (Occupational Noise Survey), **NOISE-6** (Construction and Demolition Noise Restrictions), **NOISE-7** (Steam Blow Restrictions), and **NOISE-8** (Pile Driving) as described in **Section 5.9 Noise and Vibration**. Though these measures are proposed for human receptors, the adoption of these measures would also reduce impacts to birds. Specifically, these noise COC/MM would ensure operation of the project would not cause ambient noise levels from generating facility operations to exceed 43 dBA, would require an occupations noise study to identify any noise hazardous areas within the generating facility, restrict noisy construction activities to specific timeframes, limit noise from steam blowers through mufflers or silencers, and require pile driving to be conducted in a manner that reduces noise and vibration.

To reduce impacts from fugitive dust, staff proposes dust control **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement) as described in **Section 5.1 Air Quality**. To reduce impacts to water resources, staff proposes erosion control **WATER-1** (NPDES Construction Permit Requirements) and **WATER-3** (Waste Discharge Requirement) as identified in **Section 5.16 Water Resources**. To reduce the risk of construction related materials from entering aquatic features, staff proposes **HAZ-1** and **HAZ-2**, as identified in **Section 5.7 Hazards, Hazardous Materials/Waste, and Wildfire**, which would require the preparation and approval of a HMBP and a SPCC. With the implementation of the COC/MM, impacts to common protected birds would be reduced to less than significant.

Marshland Species. The project area could provide potential nesting habitat for listed marshland species. These include southwestern willow flycatcher, a federal and state listed as endangered species that requires dense riparian habitat and standing water; California black rail, a state threatened and fully protected species that requires emergent marshland habitat; and Yuma Ridgway's rail, a federally endangered, state threatened, and CDFW fully protected species that requires freshwater marshes. There is a low potential for Gila woodpecker, a state endangered species, to occur as this species typically requires riparian forests or other large trees needed for cavity sites and is less likely to occur in the project area.

The applicant submitted the 2022 *Distribution and Occupancy of Yuma Ridgway's Rails Within the Proposed Geothermal Development Areas in Imperial County* Report (Yuma Ridgway Report; TN251679) for the three geothermal projects. The report outlines potential habitat in the area, survey methodologies, and survey results. Yuma Ridgway's rail was detected at multiple locations along the edge of Morton Bay and in the CDFW Imperial Wildlife Area, Hazard Unit. Though no other listed species were detected, these areas could also support southwestern willow flycatcher and California black rail. Because

these species are state or federally listed species, the loss of habitat would be considered a significant impact.

If present, the loss of listed bird species or a disruption to their behavior and or breeding would be considered a significant impact. As described above under MBTA and FGC Protected Birds, direct impacts to bird species could occur as a result of direct mortality by vehicle strikes; if nests or eggs were destroyed during construction activities; degradation of nesting or foraging habitat; and if nests or breeding territories were abandoned due to increased levels of human presence, noise, vibration, and fugitive dust. Direct impacts to marshland bird species would also occur if construction activities resulted in changes to water levels that affect habitat suitability and occupancy. Indirect impacts could include the loss of habitat due to the colonization of invasive or noxious weeds and long-term alterations to supporting habitat.

The Yuma Ridgway Report states the effect of noise on rail behavior and occupancy has not been studied and so reasonable impact thresholds regarding noise in areas adjacent to habitat are not known. The Report does provide recommended guidance based on known periods of communication for rails. Rails (including Yuma Ridgway's Rail and California black rail) primarily communicate during the first three hours of daylight (0.5 hours before civil sunrise through 2.5 hours after civil sunrise) and during the final three hours of daylight. The report further recommends that loud noises in areas adjacent to occupied rail habitat should be avoided during those time windows each day, especially during the courtship, pair-bonding, egg-laying, and incubation periods (1 March – 30 June).

Staff used a similar approach for Southwestern willow flycatcher, which typically communicates shortly after dawn, picks-up again in early afternoon, and increase again before dusk. Gila woodpeckers tend to be most vocal and active early the early morning and late afternoon, with communication diminishing in the evening. Courtship, pair-bonding, egg-laying, and incubation periods correspond to June through July for southwestern willow flycatcher, and April through July for Gila woodpecker. Construction related noise activities that disrupt marshland bird communication, particularly during the breeding season, would be considered a significant impact.

In addition to the impacts described above, activities that results in changes to water levels in marshes would affect habitat suitability and occupancy of marshland species. Draining, ditching, or filling marshes that currently support marshland species have the potential to adversely affect their occupancy. Any action that restricts waterflow into or out of occupied marshes has the potential to adversely affect occupancy of marshland species. Ground-disturbance activities in adjacent areas that cause water level subsidence within rail habitat could adversely impact populations. Activities that introduce invasive species or reduce cattail density or cattail re-growth during any month of the year within occupied habitat has the strong potential to reduce occupancy. Impacts that affect habitat suitability and occupancy of rail species at W Schrimpf Road and Morton Bay would be considered a significant impact.

The applicant provided measures to protect Yuma Ridgway's rail in their AFC (TN249723 Section 5.2.3.1.19 and 5.2.3.1.20). Applicant's measures included noise assessment and abatement, and rail surveys, management, and monitoring. The applicant's report on Yuma Ridgway's rail occupancy in the project area (TN251679) provided impact thresholds and recommended avoidance measures. These measures provide guidance on reducing noise impacts to rails during peak periods of communication and during the mating and nesting season. USFWS also provided recommended conservation measures to reduce impacts to Yuma Ridgway's rail, which included restriction during the nesting and molting flightless season, preconstruction surveys and monitoring, and noise attenuation. These recommendations have been incorporated into staff's proposed **BIO-13** and **BIO-14**, which also includes clarifying language on reporting. **BIO-13** (Yuma Ridgway's Rail Survey, Management, and Monitoring) and **BIO-14** (Yuma Ridgway Rail Species Noise Assessment and Abatement Plan). **BIO-13** (Yuma Ridgway's Rail Survey, Management, and Monitoring) would require the preparation of a marshland species management and monitoring plan which outlines specific construction and operation schedules and appropriate avoidance and minimization measures. The measures would include reduced vehicle speeds, habitat avoidance during the breeding season, pre-activity surveys, and construction monitoring. **BIO-14** (Yuma Ridgway Rail Species Noise Assessment and Abatement Plan) would require the preparation of a noise assessment and abatement plan that ensures noise levels at marshes occupied by marshland species never exceed 60 decimals during the breeding season or 80 decimals during the non-breeding season. **BIO-14** would also ensure overall noise from operation of the Morton Bay power plant would not exceed 60 decimals during rail peak communication hours during the breeding season. These COC/MM would be applicable in areas adjacent to habitat for Yuma Ridgway rail and other marshland species, along W Schrimpf Road and Morton Bay, which includes the location of the generating facility, production wells and well pads, and gen-tie lines and poles. Since the generating facility and gen-tie lines fall under CEC's authority, **BIO-13** and **BIO-14** apply as COCs to project components that fall under CEC's license and as MMs for project components requiring permits/authorizations by local or other jurisdictions.

To further reduce impacts, staff proposes the COC/MM described previously for Common Protected Birds. These include **BIO-12** (Conduct Pre-Activity Surveys for Nesting Birds), **BIO-5** (Worker Environmental Awareness Program), **BIO-6** (DB(s) and Biological Monitor(s)), **BIO-7** (Conduct Pre-Activity Surveys for Special-Status Wildlife), **BIO-8** (Biological Construction Monitoring), **BIO-4** (General Conservation Measures), **BIO-10** (Invasive Species Management Plan), **BIO-11** (Closure, Revegetation, and Rehabilitation Plan), **NOISE-4** (Operational Noise Restrictions), **NOISE-5** (Occupational Noise Survey), **NOISE-6** (Construction and Demolition Noise Restrictions), **NOISE-7** (Steam Blow Restrictions), and **NOISE-8** (Pile Driving).

To reduce impacts from fugitive dust, staff proposes dust control **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement). To reduce impacts to water resources, staff proposes erosion control **WATER-1** (NPDES Construction Permit Requirements) and **WATER-3** (Waste Discharge Requirement) as

identified in **Section 5.16 Water Resources**. To reduce the risk of construction related materials from entering aquatic features, staff proposes **HAZ-1** and **HAZ-2**, as identified in **Section 5.7 Hazards, Hazardous Materials/Waste, and Wildfire**, which would require the preparation and approval of a HMBP and a SPCC. With the implementation of these COC/MM, impacts to marshland birds would be reduced to less than significant levels.

Western snowy plover. Western snowy plovers are federally listed along the Pacific coast and considered a species of special concern in the interior. The Salton Sea supports the greatest number of western snowy plovers in the interior of California (USFWS 2024b). Snowy plover was observed by the applicant in a flooded agricultural field, though this observation could not be identified to subspecies. Western snowy plovers breed on sandy, gravelly, or friable soil along alkaline and saline water within minimal to no vegetation. This could include iodine bush scrub communities and other flats adjacent to the project area. Foraging could occur in adjacent habitats, including agricultural areas. The loss of western snowy plovers or their habitat would be considered a significant impact. Direct and indirect impacts to this species is described previously for Common Protected Birds. Direct impacts to bird species would occur if nests or eggs were destroyed during construction activities; degradation of nesting or foraging habitat; and if nests or breeding territories were abandoned due to increased levels of human presence, noise, vibration, and fugitive dust. Indirect impacts could include the loss of habitat due to the colonization of invasive or noxious weeds and long-term alterations to supporting habitat.

Construction of the proposed project would result in 20.02/17.91 acres of temporary and permanent impacts to iodine bush scrub, which could provide potential habitat in areas with highly alkaline or saline soils with little vegetation cover. Typical nesting habitat for plovers is in these types of habitats along the Salton Sea margins. However, the location of iodine bush scrub in the project area is patchy and typically inland. Up to 743.28/61.18 acres of agricultural lands, which is known to provide suitable foraging habitat for plovers, would also be impacted. Given most of the surrounding landscape consists of agriculture, approximately 500,000 acres total Imperial County (Census of Agriculture 2017; see TN254015), impacts to agricultural lands in the project area would result in a minor reduction in available habitat. Though the typical breeding habitat utilized by western snowy plover has a lower potential to be colonized by invasive species, any loss of habitat due to invasive plants would be considered a significant impact.

To reduce impacts, staff proposes the same measures described previously for Common Protected Birds. These include **BIO-12** (Conduct Pre-Activity Surveys for Nesting Birds), **BIO-5** (Worker Environmental Awareness Program), **BIO-6** (DB(s) and Biological Monitor(s)), **BIO-7** Conduct Pre-Activity Surveys for Special-Status Wildlife), **BIO-8** (Biological Construction Monitoring), **BIO-4** (General Conservation Measures), **BIO-10** (Invasive Species Management Plan), **BIO-11** (Closure, Revegetation, and Rehabilitation Plan), **NOISE-4** (Operational Noise Restrictions), **NOISE-5** (Occupational Noise Survey), **NOISE-6** (Construction and Demolition Noise Restrictions), **NOISE-7** (Steam Blow Restrictions), and **NOISE-8** (Pile Driving).

To reduce impacts from fugitive dust, staff proposes dust control **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement) as described in **Section 5.1 Air Quality**. To reduce impacts to water resources, staff proposes erosion control **WATER-1** (NPDES Construction Permit Requirements) and **WATER-3** (Waste Discharge Requirements) as identified in **Section 5.16 Water Resources**. To reduce the risk of construction related materials from entering aquatic features, staff proposes COCs **HAZ-1** and **HAZ-2**, as identified in **Section 5.7 Hazards, Hazardous Materials/Waste, and Wildfire**, which would require the preparation and approval of a HMBP and a SPCC. With the implementation of these COC/MM, impacts to marshland birds would be reduced to less than significant levels.

Pelicans. American white pelicans (*Pelecanus erythrorhynchos*) and California brown pelican (*Pelecanus occidentalis californicus*) have historically nested at the Salton Sea. The loss of white pelican colonies at the Salton Sea began in the 1950s due to the loss of habitat from water diversions and land reclamation for agriculture (Shuford and Gardali, 2008). Brown pelicans have been known to nest on Mullet Island, Obsidian Butte, and the Alamo River Delta (CDFW undated). In a 2003 formal consultation for a CalEnergy project, USFWS stated that no brown pelican nesting activity has been recorded at the Salton Sea since 1998 (TN252491-1). There are four CNDDB records for brown pelican in the vicinity of the geothermal projects. Overall, these records indicate a lack of nesting by pelicans over the last two decades. There is also evidence that the loss of fish or large invertebrates in deep water habitat is resulting in a loss of bird species, such as grebes, pelican, cormorants, and others that rely on fish species (Audubon 2019). Though this shift in species and prey behavior is not project related, it does further reduce the likelihood that pelicans would begin nesting again at the Salton Sea within the near future.

Construction of the proposed project is not expected to result in the loss of white or brown pelican nesting sites. Direct impact to these species could include degradation of foraging habitat or disturbance should they occur in areas close to the project during construction. Indirect impacts could include the loss of habitat due to colonization of invasive or noxious weeds and long-term alterations to supporting habitat.

To reduce impacts, staff proposes the same measures described previously for Common Protected Birds. These include These include **BIO-12** (Conduct Pre-Activity Surveys for Nesting Birds), **BIO-5** (Worker Environmental Education Program), **BIO-6** (Designated Biologist(s) and Biological Monitor(s)), **BIO-7** (Conduct Pre-Activity Surveys for Special-Status Wildlife), **BIO-8** (Biological Construction Monitoring), **BIO-4** (General Conservation Measures), **BIO-10** (Invasive Species Management Plan), **BIO-11** (Closure, Revegetation, and Rehabilitation Plan), **NOISE-4** (Operational Noise Restrictions), **NOISE-5** (Occupational Noise Survey), **NOISE-6** (Construction and Demolition Noise Restrictions), **NOISE-7** (Steam Blow Restrictions), and **NOISE-8** (Pile Driving).

To reduce impacts from fugitive dust, staff proposes dust control **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement) as described in **Section 5.1 Air Quality**. To reduce impacts to water resources, staff proposes erosion

control **WATER-1** (NPDES Construction Permit Requirements) and **WATER-3** (Waste Discharge Requirements) as identified in **Section 5.16 Water Resources**. To reduce the risk of construction related materials from entering aquatic features, staff proposes **HAZ-1** and **HAZ-2**, as identified in **Section 5.7 Hazards, Hazardous Materials/Waste, and Wildfire**, which would require the preparation and approval of a HMBP and a SPCC. With the implementation of these COC/MM, impacts to marshland birds would be reduced to less than significant levels.

Burrowing Owl. Burrowing owls are common in the Imperial Valley and are found along the many earthen berms and concrete canals that border the many open fields and agricultural areas. Burrowing owls were observed within the project area during wildlife reconnaissance-level and focused surveys conducted by the applicant. Based on the 2024 Burrowing Owl Survey Report (TN254834), 6 occupied burrows could be permanently impacted by construction (see Table 5.2-3).

TABLE 5.2-3 SUMMARY OF OCCUPIED BURROW OBSERVATION LOCATIONS AND POTENTIAL PERMANENT IMPACTS TO OCCUPIED BURROWS FOR THE PROPOSED PROJECT

Number of Burrows in Biological Study Area	Number of Burrows in Buffer	Total Number of Burrows
7	29	36
Burrows for each of the three geothermal projects overlap each other, and the same burrow could be represented in all three projects.		
Potentially Permanently Impacted Burrows	**Burrows Not Permanently Impacted**	**Total Number of Burrows**
6	1	7
These numbers only include occupied burrows in the Biological Study Area. Occupied burrows in the buffer are not included.		

Direct impacts to burrowing owls would include the crushing of any suitable burrows, removal or disturbance of vegetation including mowing, increased noise levels from heavy equipment, increased human presence, and exposure to fugitive dust. Indirect impacts could include the loss or degradation of foraging or breeding habitat due to the colonization of noxious weeds, altered plant community composition caused by operation and maintenance, and long-term human presence associated with the 29-month construction schedule.

Increased human presence from maintenance personnel during construction would flush or otherwise disturb nesting bird species, including burrowing owls. The strategy for displacing owls depends greatly on how the owls are using the site, their number, and the timing of construction activities. Because project construction would occur for up to 29 months and passive relocation may result in the repeated harassment of owls should the owls relocate into areas subject to later project disturbance either at the facility site or the various construction camps and laydown areas. While construction of replacement burrows in nearby off-site areas would have some potential benefits to the species, it is likely that burrowing owls would select available, natural burrow sites if available near their previously occupied territories. Because of the timeframe, this behavior could

necessitate multiple passive relocation events for individual birds. Each relocation event would stress the birds and exposes them to increased predation risk, thermal stress, and potential territorial disputes.

If burrowing owls are present within or adjacent to a construction zone, disturbance could destroy occupied burrows or cause the owls to abandon burrows. Construction during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. The loss of occupied burrowing owl habitat (habitat known to have been occupied by owls during the nesting season within the past three years) or reductions in the number of this rare species, either directly or indirectly through nest abandonment or reproductive suppression, would constitute a significant impact absent mitigation. Furthermore, burrowing owls and their nests are protected under both federal and State laws and regulations, including the Migratory Bird Treaty Act and California Fish and Game Code Section 3503.5.

It is likely that up to six burrows occur in the project disturbance footprint and could be permanently impacted during construction. These burrows would need to be assessed prior to construction and the owls relocated if present. To reduce potential impacts to burrowing owls that nest or are residing within burrows in the project impact area, the applicant has proposed conducting pre-construction surveys on the proposed generating facility location using established protocols. If present the applicant proposes to passively displace the owls and construct replacement burrows in adjacent areas. In addition, the applicant has proposed general avoidance measures for nesting birds which require avoidance during the breeding season.

Burrowing owl burrows that occur along IID irrigation features or outside permanently impacted areas would not be physically disturbed but may be temporarily impacted by project activities. Human presence, noise, vibration, and fugitive dust may result in temporary impacts such as disruption of breeding behavior and possible nest abandonment.

Habitat loss and degradation from rapid urbanization of farmland in the core areas of the Central and Imperial valleys is the greatest of many threats to burrowing owls in California (Shuford and Gardali 2008). Construction would result in temporary and permanent impacts to 743.28/6.18 acres of agricultural areas used as foraging habitat. Burrowing owls are not typically known to forage in riparian or marshland habitat, but likely use edge areas searching for small mammals, crayfish, and insects. As such, loss of these habitats is not anticipated to impact burrowing owl foraging. The destruction of burrowing owl nests, burrowing owl burrows, and burrowing owl foraging habitat would result in a significant impact. Alternations to breeding behavior or nest abandonment would also result in a significant impact. For burrows that cannot be avoided, burrowing owl exclusion would be conducted during the non-breeding season. Exclusion and eviction of burrowing owls would be considered a significant impact.

The applicant provided measures to reduce impacts from the displacement of burrowing owls (TN249737, AFC Section 5.2.3.11-5.2.3.12). Staff proposes modifications to these

measures based on guidance provided by CDFW, and to include clarifying language. **BIO-15** (Burrowing Owl Surveys, Monitoring, Prevention, and Relocation) and **BIO-16** (Burrowing Owl Habitat Preservation and Enhancement) based on agency guidance. **BIO-15** (Burrowing Owl Surveys, Monitoring, Prevention, and Relocation) would require surveys and avoidance of occupied burrowing owl burrows whenever possible. **BIO-16** (Burrowing Owl Habitat Preservation and Enhancement) would require enhancement of unsuitable burrows or installation of new burrows at a 2:1 ratio for every burrowing owl burrow that is destroyed, and enhancement or replacement of burrowing owl foraging habitat at a 1:1 ratio. Based on these ratios, the applicant must protect and manage land for burrowing owls either through habitat created nearby and/or through payment at a CDFW approved conservation bank. Given these burrows are within the project boundary of all three geothermal projects, the applicant would submit a Burrowing Owl Mitigation Plan that includes mitigation combined for all three projects to avoid duplicate mitigation requirements. **BIO-15** and **BIO-16** apply as COCs to project components that fall under CEC's license and as MMs for project components requiring permits/authorizations by local or other jurisdictions.

To further reduce impacts, staff proposes COC/MM described previously for Common Protected Birds. These include **BIO-12** (Conduct Pre-Activity Surveys for Nesting Birds), **BIO-5** (Worker Environmental Awareness Program), **BIO-6** (DB(s) and Biological Monitor(s)), **BIO-7** (Conduct Pre-Activity Surveys for Special-Status Wildlife), **BIO-8** (Biological Construction Monitoring), **BIO-4** (General Conservation Measures), **BIO-10** (Invasive Species Management Plan), **BIO-11** (Closure, Revegetation, and Rehabilitation Plan), **NOISE-4** (Operational Noise Restrictions), **NOISE-5** (Occupational Noise Survey), **NOISE-6** (Construction and Demolition Noise Restrictions), **NOISE-7** (Steam Blow Restrictions), and **NOISE-8** (Pile Driving).

To reduce impacts from fugitive dust, staff proposes dust control **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement) as described in **Section 5.1 Air Quality**. To reduce impacts to water resources, staff proposes erosion control **WATER-1** (NPDES Construction Permit Requirements) and **WATER-3** (Waste Discharge Requirements) as identified in **Section 5.16 Water Resources**. To reduce the risk of construction related materials from entering aquatic features, staff proposes **HAZ-1** and **HAZ-2**, as identified in **Section 5.7 Hazards, Hazardous Materials/Waste, and Wildfire**, which would require the preparation and approval of a HMBP and a SPCC. With the implementation of these COC/MM, impacts to burrowing owls would be reduced to less than significant levels.

Foraging Birds. Greater sandhill crane, Swainson's hawk, little willow flycatcher, golden eagle, and bald eagle are state listed or otherwise protected species that are known to foraging or use the area as winter migrates, primarily in agricultural areas. American peregrine falcon and California brown pelican, though federally and state delisted, are still afforded certain protections, and could also use the area for foraging or winter migration. Numerous other bird species that are CDFW SSC and WL, USFWS BCC, or

protected under the MBTA and FGC, utilize the Salton Sea, Alamo River, and adjacent areas for foraging.

Direct impacts to these species include degradation of foraging habitat, and disturbance due to increased levels of human presence, noise, vibration, and fugitive dust. The removal of foraging habitat for listed species would typically be considered a significant impact, directly through the removal of vegetation that could support food and prey species, and indirectly due to the long-term alternation of available habitat. Indirect impacts could include the loss of habitat due to colonization of invasive or noxious weeds and long-term alterations to supporting habitat. The introduction of non-native or invasive weeds could impact the quality of foraging habitat for listed bird species.

A majority of the temporary and permanent impacts, up to 743.28/6.18 acres, occur in agricultural areas, which is known to provide suitable foraging habitat for various bird species. Impacts to agricultural lands due to project activities would result in a small reduction compared to the 500,000 acres total agricultural lands in Imperial County (Census of Agriculture 2017; see TN254015). The project may also result in up to 5.18/5.43 acres of impacts to tamarisk thickets, 20.38/17.42 acres of impacts to Typha herbaceous alliance (cattail marsh), and 20.02/17.91 acres of impacts to iodine bush scrub. Concrete canals and disturbed areas lacking vegetation often do not support quality foraging habitat for most species of birds.

To offset temporary impacts associated with the construction camps and laydown areas, staff proposes modifications to applicant's Closure, Revegetation and Rehabilitation Plan measure (TN250679) by specifying the areas that would require revegetation, adding restoration techniques, and including verification requirements. These modifications have been incorporated into staff's proposed **BIO-11** (Closure, Revegetation, and Rehabilitation Plan), which requires the applicant to develop a site restoration plan for temporarily disturbed areas after construction, including reverting these areas back to the previous land use, such as agricultural production. Staff also proposes **BIO-17** (Habitat Compensation or Restoration Plan), which would require habitation compensation and habitat restoration for permanent impact to native, semi-natural, and riparian habitat, including tamarisk thickets, cattail marsh, and iodine bush scrub. **BIO-17** applies as a COC to project components that fall under CEC's license and as an MM for project components requiring permits/authorizations by local or other jurisdictions.

To further reduce impacts, staff proposes the same COC/MM described previously for Common Protected Birds. These include **BIO-12** (Conduct Pre-Activity Surveys for Nesting Birds), **BIO-5** (Worker Environmental Awareness Program), **BIO-6** (DB(s) and Biological Monitor(s)), **BIO-7** (Conduct Pre-Activity Surveys for Special-Status Wildlife), **BIO-8** (Biological Construction Monitoring), **BIO-4** (General Conservation Measures), **BIO-10** (Invasive Species Management Plan), **BIO-11** (Closure, Revegetation, and Rehabilitation Plan), **NOISE-4** (Operational Noise Restrictions), **NOISE-5** (Occupational Noise Survey), **NOISE-6** (Construction and Demolition Noise Restrictions), **NOISE-7** (Steam Blow Restrictions), and **NOISE-8** (Pile Driving).

To reduce impacts from fugitive dust, staff proposes dust control **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement) as described in **Section 5.1 Air Quality**. To reduce impacts to water resources, staff proposes erosion control COC/MM **WATER-1** (NPDES Construction Permit Requirements) and **WATER-3** (Waste Discharge Requirements) as identified in **Section 5.16 Water Resources**. To reduce the risk of construction related materials from entering aquatic features, staff proposes **HAZ-1** and **HAZ-2**, as identified in **Section 5.7 Hazards, Hazardous Materials/Waste, and Wildfire**, which would require the preparation and approval of a HMBP and a SPCC. With the implementation of these COC/MM, impacts to foraging birds would be reduced to less than significant levels.

Mammals

The project site does not provide habitat for federally or state listed mammal species. The project site could provide potential habitat for a variety of special status bat species. The area could also provide habitat for denning species such as American badger or desert kit fox. Desert bighorn sheep, a CDFW fully protected species, it not expected to occur within the project area given that they occur in large expanses of desert mountain ranges. Typically, desert bighorn sheep forage within one mile of the foothills where adequate escape habitat occurs. As the proposed project is within disturbed and developed areas, bighorn sheep are not expected to forage or move through this area. Likewise, no lambing areas would be impacted by the proposed project. Lambing areas are typically associated with ledges on steep cliffs where the females can protect the lambs from predation.

Bat Species. Bats utilize a variety of daytime rooting sites, including caves, rock crevices, mines, trees and snags, bridges, and buildings and structures. While some bats are colonial, living in large colonies in caves or under bridges, others are solitary, roosting in trees and crevices. Sensitive periods for bats include the hibernation season, when bats are sustaining on fat reserves, and the maternity season, when female bats give bird to babies. The decline of bat populations is often due to roost site disturbance or loss. Due to their sensitivity to noise, human presence, and other disturbance factors, impacts to bat roosts would be considered a significant impact.

The project area is within the range of several species of bats. Though the site does not provide high quality natural habitat for most bat species, there is the potential for roosting in buildings, structures, or nearby trees, or foraging in the surrounding habitat. Bats could also occur beneath the concrete lined drains where cavities have formed. The following bat species were determined to have a moderate or higher potential to occur at the project site: pallid bat (*Antrozous pallidus*), spotted bat (*Euderma maculatum*), western mastiff bat (*Eumops perotis californicus*), western yellow bat (*Lasiurus xanthinus*), California leaf-nosed bat (*Macrotus californicus*), and pocketed free-tailed bat (*Nyctinomops femorosaccus*). All these species have the potential to forage within the project area, and some bat species utilize large areas for foraging. For example, the pallid bat is capable of flying more than 18 miles, although most foraging occurs within about two miles of the diurnal roost (Hermanson and O'Shea 1983). Several other special status

bat species have a low potential to occur; and several common bat species could also be present in the project area. Direct impacts to special status bat species could include loss of habitat; disturbance to roosting, maternity, or hibernacula sites; mortality or injury; and the introduction or spread of white-nose syndrome. Bats that forage near the ground, such as the pallid bat, would also be subject to crushing or disturbance by vehicles driving at dusk, dawn, or during the night. Indirect effects include the loss of foraging habitat due to type conversion, nighttime lighting that exposes bats to predation, and alteration in prey bases.

Most of the temporary and permanent impacts to vegetation would occur in agricultural or developed/disturbed land cover types, in a region that has been historically used for widespread agricultural purposes. In addition, impacts to agricultural lands, which is known to provide suitable foraging habitat, would result in a small reduction compared to the approximately 500,000 acres of total agricultural lands in Imperial County (Census of Agriculture 2017; see TN254015). No trees that could provide potential roosting habitat would be removed, though nearby palm or other trees cold provide roosting habitat. Existing buildings that could provide roosting habitat would not be demolished or have a significant change in use. Impacts to these habitat features would not be significant because these lands would either not be altered, result in a small disturbance given the availability of similar habitat nearby or provide only minimal vegetation structure and diversity. Similarly, disturbance to sensitive maternity or hibernacula sites in these habitats that would result in mortality or injury is not anticipated. As such, impacts would be reduced to less than significant.

Riparian and native habitats could provide greater foraging opportunities for bat species. Aquatic habitats often have a higher insect abundance, such as mosquitos and other aquatic insects, that make these areas attractive for foraging bats. Native habitats could support a higher diversity of insects for a given region. Implementation of the proposed project has the potential to result in direct and indirect impacts to riparian and native habitats, which could support foraging behavior for sensitive bat species. Direct impacts to bats could also include noise, lighting, and removal of agricultural lands for temporary construction use; as well as collision with structures or electrocution.

According to the White-Nose Syndrome Response Team (WNSRT 2024), white-nose syndrome is a disease that affects hibernating bats and is caused by the fungus *Pseudogymnoascus destructans* (or Pd). Pd grows in cold, dark places and attacks the bare skin of hibernating bats. As it grows, Pd causes changes in bats that make them become active more than usual resulting in burning fat reserves needed to survive in the winter. Bats with the syndrome may exhibit unusual behavior such as flying outside during cold winter days. Pd spores can last a long time on surfaces including clothes, shoes, and outdoor gear. Humans do not get white-nose syndrome, they can unknowingly transfer the fungus from one place to another. The most effective defense against the risk of spreading white-nose syndrome is avoiding dank areas where Pd may occur. To date in California, white-nose syndrome is presumed in Shasta, Plumas, Inyo, and San

Bernardino counites; but not in Imperial County (WNSRT 2024). It is unlikely that project activities would result in the introduction or spread of white-nose syndrome.

In general, bats are highly mobile, and it is unlikely that construction activities would result in mortality of bats in the project area. Although bats forage in the project area, most construction activities would occur during daylight hours when the potential for bat interactions is limited. The applicant has not proposed specific avoidance measures for bats and staff considers the likelihood of roosting bats to be low. However, the applicant has proposed general measures to reduce impacts to wildlife species. Staff proposes modifications to applicant's measures (TN249723, AFC Section 5.2.3.1.1-5.2.3.1.4, 5.2.3.1.6-5.2.3.1.9 and 5.2.3.1.14) based on guidance provided by CDFW and to include clarifying language. These have been incorporated into staff's proposed **BIO-5** (Worker Environmental Awareness Program) to train contractor personnel on biological resources at the site; and **BIO-6** (DB and Biological Monitor(s)), **BIO-7** (Conduct Pre-Activity Surveys for Special-Status Wildlife), and **BIO-8** (Biological Construction Monitoring) which would require the approval of DBs and monitors, biological pre-activity surveys, and routine monitoring of sensitive biological resources. **BIO-4** (General Conservation Measures) would require reduced vehicle speeds, delineation of the work zone, and access, parking, staging, and refueling outside of aquatic habitat.

Staff proposes modifications to applicant's weed measures (TN250679) by adding control of aquatic invasive species, specifying the areas that would require revegetation, adding restoration techniques, and including verification requirements. These modifications have been incorporated into staff's proposed **BIO-10** (Invasive Species Management Plan) and **BIO-11** (Closure, Revegetation, and Rehabilitation Plan), would manage weeds, require vehicles to be cleaned and free of mud and debris, require erosion control measures be certified weed free, restore disturbed areas with native or sterile non-native species, and reduce cultivation of invasive species on temporarily disturbed soils.

To reduce noise-related impacts to bats, staff proposes **NOISE-4** (Operational Noise Restrictions), **NOISE-5** (Occupational Noise Survey), **NOISE-6** (Construction and Demolition Noise Restrictions), **NOISE-7** (Steam Blow Restrictions), and **NOISE-8** (Pile Driving) as described in **Section 5.9 Noise and Vibration**. Though these measures are proposed for human receptors, the adoption of these measures would also reduce impacts to bats. Specifically, these noise COC/MM would ensure operation of the project would not cause ambient noise levels from power plant/generating facility operations to exceed 43 dBA, would require an occupations noise study to identify any noise hazardous areas within the generating facility, would restrict noisy construction activities to specific timeframes, would limit noise from steam blowers through mufflers or silencers, and would require pile driving to be conducted in a manner that reduces noise and vibration.

To reduce impacts from fugitive dust, staff proposes dust control **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement) as described in **Section 5.1 Air Quality**. To reduce impacts to water resources, staff proposes erosion control **WATER-1** (NPDES Construction Permit Requirements) and **WATER-3** (Waste Discharge Requirement) as identified in **Section 5.16 Water Resources**. To reduce the

risk of construction related materials from entering aquatic features, staff proposes **HAZ-1** and **HAZ-2**, as identified in **Section 5.7 Hazards, Hazardous Materials/Waste, and Wildfire**, which would require the preparation and approval of a HMBP and a SPCC. With the implementation of the COC/MM, impacts to bat species would be reduced to less than significant.

Denning Mammals. The project site could provide habitat for Yuma hispid cotton rat (*Sigmodon hispidus eremicus*), American badger (*Taxidea taxus*), and desert kit fox (*Vulpes macrotis arsipus*). Cotton rat are indigenous along the Colorado River and expanded their range via canals bringing irrigation water to the Imperial Valley. Their range now encompasses the entire agricultural valley south of the Salton Sea, and this species commonly inhabit marshlands, canals and drains, roadsides, and occasionally cropland features that are present in the project area. American badgers can be found in agricultural landscape because they contain dry, friable soils for burrowing and preferred foraging opportunities. For example, depending on prey densities, home ranges of badgers can vary from 338 to 1,549 acres (Ziener et al. 1990). Their distribution in a landscape coincides with the availability of prey, burrowing sites, and mates, with males ranging wider than females during the breeding and summer months (Minta 1993). While home ranges are expected to be larger and badger densities lower in more arid regions, this species could benefit from the small mammals that are associated with agricultural fields. However, these areas also provide a higher probability of rodenticides, trapping due to property damage, damage to dens due to tilling, and road mortality.

Desert kit-fox also prefer dry, friable soils for digging dens. This species is commonly associated with canals and disturbed sites near roads and is fairly tolerant of human disturbance. No sign of this species was observed but this is a far-ranging species.

Direct impacts to denning mammals could include direct loss of individuals from construction activities; increased levels of fugitive dust, noise, vibration, and human presence; destruction of natal dens; disruption of breeding behavior; and temporary and permanent loss of habitat. If present, they could also be subject to roadkill. Construction activities could also result in the disturbance of badgers, kit fox, or cotton rat maternity dens during the pup-rearing season (generally 1 February to 1 July for badgers and kit fox while cotton rats can bread year-round). Indirect impacts include alternation of soils, such as compaction that could preclude burrowing, alternation in prey base, and the spread of invasive plants.

Given the mobility and elusive nature of these species, it is likely that individuals would disperse into nearby habitat, avoiding human interactions during construction activities. However, should these species be present, injury or morality of individuals could occur. Dens could be subject to destruction during vegetation removal or other ground disturbing activities. Elevated levels of noise, vibration, fugitive dust, and human presence could result in the displacement or abandonment of active natal dens if present. However, given the existing level of disturbance and human use of the area, individuals currently inhabiting within or adjacent to the project site may be more tolerant of human activity. Reproductive females with dependent young are potentially more susceptible to

disturbance than adult males or juveniles since they must shelter and provision their young in dens. Movement of young to alternate dens may occur but requires energy and increases the risk of predation. Removal of native vegetation could reduce habitat for foraging, including seeds or vegetation for cotton rats or prey items for badger and kit fox; or future denning opportunities for all three species. If allowed to proliferate, invasive weeds can displace native vegetation and create an unfavorable environment for plants and wildlife that these species depend upon for sustenance. Direct and indirect impacts to individuals, natal dens, breeding behavior, exposure, habitat modification and invasive weeks would be considered a significant impact.

To reduce impacts, staff proposes **BIO-18** (American Badger, Desert Kit Fox, and Yuma Hispid Cotton Rat Avoidance and Minimization Measures). This condition would require surveys for dens that could support these species, closure of inactive dens in the construction area, and direction for exclusion from active dens outside the breeding season. **BIO-18** applies as a COC to project components that fall under CEC's license and as an MM for project components requiring permits/authorizations by local or other jurisdictions.

Staff proposes modifications to applicant's measures (TN249723, AFC Section 5.2.3.1.1-5.2.3.1.4, 5.2.3.1.6-5.2.3.1.9 and 5.2.3.1.14) based on guidance provided by CDFW and to include clarifying language. These have been incorporated into staff's proposed **BIO-5** (Worker Environmental Awareness Program) to train contractor personnel on biological resources at the site; and **BIO-6** (DB(s) and Biological Monitor(s)), **BIO-7** (Conduct Pre-Activity Surveys for Special-Status Wildlife), and **BIO-8** (Biological Construction Monitoring) which would require the approval of DBs and monitors, biological pre-activity surveys, and routine monitoring of sensitive biological resources. **BIO-4** (General Conservation Measures) would require reduced vehicle speeds, delineation of the work zone, and access, parking, staging, and refueling outside of aquatic habitat.

Staff proposes modifications to applicant's weed measures (TN250679) by adding control of aquatic invasive species, specifying the areas that would require revegetation, adding restoration techniques, and including verification requirements. **BIO-10** (Invasive Species Management Plan) and **BIO-11** (Closure, Revegetation, and Rehabilitation Plan), would manage weeds, require vehicles to be cleaned and free of mud and debris, require erosion control measures to be certified weed free, restore disturbed areas with native or sterile non-native species, and reduce cultivation of invasive species on temporarily disturbed soils.

To reduce any noise-related impacts to denning mammals, staff proposes **NOISE-4** (Operational Noise Restrictions), **NOISE-5** (Occupational Noise Survey), **NOISE-6** (Construction and Demolition Noise Restrictions), **NOISE-7** (Steam Blow Restrictions), and **NOISE-8** (Pile Driving) as described in **Section 5.9 Noise and Vibration**. Though these measures are proposed for human receptors, the adoption of these measures would also reduce impacts to denning mammals. Specifically, these would ensure operation of the project would not cause ambient noise levels from the generating facility operations to exceed 43 dBA, would require an occupations noise study to identify any noise

hazardous areas within the generating facility, restrict noisy construction activities to specific timeframes, would limit noise from steam blowers through mufflers or silencers, and would require pile driving to be conducted in a manner that reduces noise and vibration.

To reduce impacts from fugitive dust, staff proposes dust control **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement) as described in **Section 5.1 Air Quality**. To reduce impacts to water resources, staff proposes erosion control **WATER-1** (NPDES Construction Permit Requirements) and **WATER-3** (Waste Discharge Requirements) as identified in **Section 5.16 Water Resources**. To reduce the risk of construction related materials from entering aquatic features, staff proposes **HAZ-1** and **HAZ-2**, as identified in **Section 5.7 Hazards, Hazardous Materials/Waste, and Wildfire**, which would require the preparation and approval of a HMBP and a SPCC. With the implementation of these COC/MM, impacts to denning mammals would be reduced to less than significant.

Herbicide/Rodenticide during Construction & Operation

Less Than Significant with Mitigation Incorporated. During construction the applicant may use herbicides to control weeds. The applicant mentioned the potential use of rodenticides and herbicides and indicated their use would be developed in consultation with the agencies and CEC staff. If exposed to herbicides or rodenticides, sensitive wildlife species could be subject to poison or mortality. Herbicide use on plants that may be ingested by wildlife, or drift on invertebrates that may be ingested by wildlife, can result in an accumulation of large amounts of contaminants over time. In turn, predators can be affected via food-chain concentrations when small herbivores consume material exposed to contaminants or contaminated residue. Toxic exposure of herbicides to fish or other aquatic wildlife can include effects on reproduction, growth, egg hatchability, and survival of young. Rodenticides could directly impact Yuma hispid cotton rat through ingestion, resulting in mortality of individuals, which could also result in mortality to young that are unable to survive on their own. Wildlife that that prey on rodents, such as birds of prey, wolverines, or desert kit fox, could be exposed to lethal doses of rodenticides through ingestion of contaminated prey items.

To ensure impacts to sensitive wildlife species are minimized **BIO-2** (Pesticide Application Requirements) would require licensed applicators and employing best management practices during herbicide use. The applicant would only use herbicides and best management practices that have been approved by CEC and CDFW for use based on evaluations of toxicity, solubility, soil adsorption potential, and persistence in water and soil. In addition, the applicant would use employees or contractors with required applicator licenses/certificates to apply herbicides. With the implementation of these COC/MM, potential impacts to sensitive wildlife species would be reduced to less than significant.

To reduce impacts from fugitive dust, staff proposes dust control **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement) as described in

Section 5.1 Air Quality. To reduce impacts to water resources, staff proposes erosion control **WATER-1** (NPDES Construction Permit Requirements) and **WATER-3** (Waste Discharge Requirements) as identified in **Section 5.16 Water Resources**. To reduce the risk of construction related materials from entering aquatic features, staff proposes **HAZ-1** and **HAZ-2**, as identified in **Section 5.7 Hazards, Hazardous Materials/Waste, and Wildfire**, which would require the preparation and approval of a HMBP and a SPCC. With the implementation of the COC/MM, impacts from herbicides and rodenticides would be reduced to less than significant.

Operation/Decommissioning

Less Than Significant Impact with Mitigation Incorporated. The generating facility is expected to have an operation life of 40 years and have an on-site operation staff of 61 full-time employees. The facility is capable of operation seven days a week, 24 hours a day. At the end of its 40-year lifespan, if the facility is still economically viable, it would continue to operate. Once the facility is no longer economically viable, the facility would be permanently closed.

Operations: Project operation and maintenance activities could generate varying levels of human presence, lighting, and noise adjacent to the proposed generating facility location, offsite well pads, and in proximity to the injection well pipelines. Direct impacts to special-status species, if present during operations, hazardous material spills, exposure to brine and other ponds, exposure to geothermal atmospheric flashing, collision with the gen-tie lines, exposure to night lighting, could include exposure to increased levels of human presence, operations noise, and nitrogen emissions and deposition. Indirect impacts could include the degradation of adjacent habitats from the introduction and spread of invasive and noxious weeds.

Hazardous Materials: Facilities operations would require on-going handling of hazardous materials and wastes. Accidental spills could result in toxic exposure to wildlife and degradation of habitat or aquatic resources. Though operations of the facility are not expected to have any direct impacts to IID canals or drains or other aquatic features, accidental pipe ruptures that releases fluid into a canal or waterway would be considered a significant impact. To reduce impacts to water resources during operation, staff proposes **WATER-2** (Operations Drainage, Erosion, and Sedimentation Plan) as identified in **Section 5.16 Water Resources**. To reduce the risk of hazardous materials from entering aquatic features, staff proposes **HAZ-1** and **HAZ-2**, as identified in **Section 5.7 Hazards, Hazardous Materials/Waste, and Wildfire**, which would require the preparation and approval of a HMBP and a SPCC. With the implementation of these COC/MM, impacts to sensitive wildlife from hazardous would be reduced to less than significant.

Class II Surface Impoundment (Brine Ponds), Service Water Pond, Storm Water Retention Pond. A concrete surfaced Class II surface impoundment basin (brine pond) would be at the generating facility site to primarily collect geothermal fluid. The brine pond would also receive fluid generated during emergency situations, maintenance

operations, spills and water from hydro blasting, portable shower effluent, vehicle wash station effluent, and reject water from reverse osmosis system (TN249723). Conditions at the brine pond may be unattractive to wildlife due to ephemerality, high discharge temperatures, unpalatable salinity, and higher quality habitat nearby. Predicted concentrations of metals in the brine fluid are of a potential risk to wildlife. The brine water itself is projected to be approximately 386 ppt, which is over six times the salinity of the Salton Sea, and over ten times the salinity of the ocean. As such, they are not expected to support prey items, algae, or vegetation or algae that may attract wildlife. Exposure due to contract with brine fluid is expected to be minimal as metals typically are unable to penetrate fur, feathers, and skin. Brine water, if ingested, presents a risk of adverse effects, particularly lead and arsenic (TN252491-1). Though the high salinity of the brine ponds is expected to be unattractive to wildlife as a source of drinking water, accidental ingestion could occur if wildlife becomes entrapped in the brine pond. Bats may ultimately be attracted to project features such as night lighting, and the brine ponds as these features may attract prey items such as insects.

Wildlife could gain access to the brine pond and experience toxicity through ingestion or injury or mortality from entrapment. The applicants proposed design includes fencing the entire generating facility, including the pond, reducing the risk of wildlife being able to access the brine pond (TN252491-1). However, burrowing and flying animals, including bird and bat species, could bypass the fence and gain access to the brine pond. To reduce mortality of species that that might encounter the brine ponds, the pond would have a 3:1 slope for wildlife escape. Concrete lining would provide traction to facilitate upward movement. During operations, the brine pond would be inspected regularly, and an environmental field technician would conduct weekly pond inspections. Any wildlife that enters the facility or encounters the pond would be identified during pond inspections.

The service water pond will hold water for facility service water needs, and the storm water retention pond will be used to hold water during flooding events. Sources of water, especially freshwater, can be an attractant to wildlife. As mentioned previously, the applicant's proposed design includes fencing the entire generating facility, including the service water pond and storm water retention pond. However, burrowing and flying animals, including bird and bat species, could bypass the fence and gain access to the brine pond. Though the storm water retention pond would only hold freshwater during flooding events, which would be periodic and incidental, it would be considered a significant impact if animals became trapped in the pond. To further reduce potential impacts to species that may access the brine pond, service water pond, and storm water retention pond, staff proposes **BIO-19** (Facility Pond Wildlife Escape and Monitoring Plan) during operations. Monitoring would determine if wildlife are utilizing the brine pond, and require corrective actions to prevent further injury or mortality to wildlife. This measure would also require the applicant include design features for the service water pond and storm water retention pond that allow wildlife to escape if they gain access to the ponds. Since ponds fall under the CEC's license, **BIO-19** is a COC.

Brine ponds represent a potential source of hazardous waste and emissions. Spill-related contamination could result in a direct impact to aquatic resources and wildlife habitat. The brine ponds would be within the fenced geothermal facility, minimizing hazardous material spill into sensitive habitats. If a brine ponds spill does occur, it could drain into stormwater facilities and become discharges into aquatic habitat. To reduce impacts to water resources, staff proposes **WATER-3** (Waste Discharge Requirement) (WDR) as described in **Section 5.16 Water Resources**, which would require the applicant to comply with waste discharge requirements (WDR) for the construction and operation of the project's brine ponds. As part of the WDRs, brine pond fluids and solids would be tested on a semi-annual basis to ensure compliance. In addition, staff proposes **HAZ-4** and **HAZ-7** as described in **Section 5.7 Hazards, Hazardous Materials/Waste, and Wildfire**, which requires the project owner to report hazardous waste generator identification numbers from the U.S. Environmental Protection Agency (USEPA) prior to generating any hazardous wastes, and preparation of a Site Management Plan (SMP) that establish appropriate management practices and procedures for handling impacted soil or groundwater prior to any ground disturbing activities. With implementation of the COC/MM, impacts from brine ponds would be reduced to less than significant.

Geothermal Atmospheric Flash System. The AFC (TN249723) describes the atmospheric flash system (AFS), which lowers the fluid pressure from the low-pressure crystallizer to atmospheric pressure conditions. The steam from the atmospheric flash system is discharged to the dilution water heaters and excess steam is vented to the atmosphere. Data Response Set 1 (TN252491-1) stated that the steam and fluid exit at a temperature of 216 degrees Fahrenheit (°F) and a pressure of 1 pound per square inch gauge (psig). The atmospheric flash tank is 95 feet above grade and would operate continuously anytime electricity is being generated or geothermal fluid is flowing in the facility. The plume emitted by the AFS would exponentially cool from 216°F when it exits to ambient temperature. Though rate at which the cooling would occur is proportional to the difference between the temperature of the steam and the surrounding temperature, no timeframe was provided for the rate of cooling, or the area above the atmospheric flash tank that might be affected by this high temperature steam.

CEC staff conducted a literature search on stack height and atmospheric flash impacts on avian species. To date, CEC staff has been unable to ascertain any research on the impacts of flash systems on avian species, particularly bats and birds. Average flight heights of migratory birds in the western United States average around 2,600 feet high and can reach up to 6,000 feet in altitude (ABB 2021). As such, atmospheric flashing is not anticipated to impact birds during migration. Bird flights could be much lower during activities such as foraging and nest construction; however, generating facility structures are not anticipated to provide foraging opportunities or nest building materials. Staff is unable to substantiate any known instances of birds that suffered injury from steam flashing at CEC facilities that are currently being operated. Injury or mortality avian species encountering the steam venting is unlikely, and if did occur, would be incidental in nature. Anecdotal evidence of birds injured by thermal flumes, if they were to occur, would be discovered during routine inspections, and per **BIO-4** (General Conservation

Measures), any injured special-status wildlife species found within or near the project site shall be reported to CDFW and/or USFWS within one workday. As such, impacts from the atmospheric flash system is considered less than significant.

Gen-Tie Lines. The project would involve the construction of generation gen-tie 230 kilovolt (kV) transmission line that tie into the IID transmission system. Avian species can be electrocuted by transmission lines if avian species fly into the electrical lines, if wings simultaneously contact two conductors of different phases, or if body parts simultaneously contact a conductor and grounded hardware. Most electrocutions occur on medium-voltage distribution lines less than 60 kV, in which the spacing between conductors may be small enough to be bridged by avian species. Poles with energized hardware, such as transformers, can be especially hazardous, even to small avian species, as they contain numerous, closely spaced energized parts. Large raptors are especially at risk, particularly in open habitats where limited natural perches exist, and power poles are used as roosting and nesting sites as well as hunting perches. Other birds such as crows, ravens, magpies, small flocking birds and wading birds, as well as bats, can also be electrocuted. Avian electrocution risk is greater on distribution lines than on transmission lines. Transmission conductors generally have larger separations that are supported on poles or towers. Transmission lines can also accommodate more circuits and electrical hardware, allowing for a greater separation of energized and grounded parts (APLIC & USFWS 2005; APLIC 2006).

To reduce impacts, staff proposes modifications of monitoring reporting details and schedule language in applicant measures (TN249737, AFC Section 5.2.3.10 and 5.2.3.14), which have been incorporated into staff's proposed **BIO-20** (Avian Collision Deterrent Proposal and Monitoring Plan). **BIO-20** would require incorporation of construction design recommendations provided in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). Specifically, the phase conductors shall be separated by a minimum of 60 inches and bird perch diverters and/or specifically designed avian protection materials should be used to cover electrical equipment where adequate separation is not feasible (APLIC 2006). Since gen-tie lines fall under the CEC's license, **BIO-20** is a COC. However, this requirement is discussed in **BIO-4** (General Conservation Measures) and could be modified if adopted by local or other jurisdictions. With implementation of these COC/MM, impacts from operation of gen-tie lines would be reduced to less than significant.

Night Lighting. Night lighting could disturb resting, foraging, or mating activities of wildlife and make wildlife more visible to predators. Night lighting could also attract birds and bats to areas which could result in collisions on tall structures. Additionally, certain lighting may attract insects which in turn may attract birds and bats to forage. To reduce impacts, the applicant is including design features while also meeting the requirements for security and safety. Lighting would be shielded and pointed downward and away from the habitat outside of the project area to minimize impacts to nesting birds and other nearby wildlife, and to reduce the potential for avian and bat attraction and collision. All lighting that is not required to be on during nighttime hours would be controlled with

sensors or switches operated such that the lighting would be on only when needed. Implementation of these applicant-proposed design measures would allow areas surrounding the project to remain un-illuminated (dark) most of the time, thereby minimizing the amount of lighting potentially visible off site and minimizing the potential for lighting impacts to proximate wildlife. These features have been incorporated into **VIS-2** as described in **Section 5.15.5, Visual Resources** and **BIO-4** (General Conservation Measures). With implementation of lighting COC/MM, impacts to special-status wildlife would be reduced to less than significant.

Increased Human Presence: Wildlife could be subject to roadkill as vehicles travel on the rural road system surrounding the facility, particularly larger mammals such as American badger and desert kit fox. Increased human presence from maintenance personnel during operations would flush or otherwise disturb sensitive wildlife, including nesting bird species. The area is currently actively managed for agricultural land use and geothermal facilities, which results in an existing level of human disturbance. Mortality of wildlife during operational activities due to increased human presence would be considered a significant impact. To reduce impacts, staff proposes modifications to applicant's measures (TN249723, AFC sections 5.2.3.1.5-5.2.3.1.7, and 5.2.3.1.14) based on guidance provided by CDFW and to include clarifying language. These have been incorporated into staff proposed **BIO-4** (General Conservation Measures) and **BIO-21** (Biological Resources Mitigation Implementation and Monitoring Plan) which would require reduced vehicle speeds, reporting of any injured or dead wildlife, up-to-date maps depicting the location of sensitive biological resources, and detailed descriptions of measures to be taken to avoid or mitigate disturbances. **BIO-21** applies as a COC to project components that fall under CEC's license and as a MM for project components requiring permits/authorizations by local or other jurisdictions. With implementation of these COC/MM, impacts to sensitive wildlife from increased human presence would be reduced to less than significant.

Operational Noise. Direct impacts to wildlife species could occur from noise associated with operations of the proposed project. Impacts could include disturbance or disturbance to breeding behavior, such as masking or distorting advertisement calls, inducing a stress response that negatively impacts fitness, or abandonment of nests or young. The applicant provided a range of range of octave band sound pressure levels from typical operational noise in Tables DR 228-1 and DR 228-2 (TN254015). Operational noise from facility operations at 730 feet would be between 45-72 Hz, and for well operation would be between 36-57 Hz at 60 feet. Most equipment would be specified to have new-field maximum noise levels that do not exceed 90 A-weighted decibels (dBA) at three feet from the activity (or 85 dBA at three feet where available as a vendor standard) to limit the noise exposure of generating facility personnel to acceptable levels. During normal steady-state operations, an 80 dBA threshold should not be exceeded beyond generating facility boundaries (TN250679).

As stated under the Common Protected Birds section, the Caltrans 2016 *Technical Guidance for Assessment and Mitigation of the Effects of Traffic Noise and Road*

Construction Noise on Birds summarizes literature on effects of traffic noise to bird species. The Caltrans guidance states that birds are more resistant to hearing loss and auditory damage but may have a more pronounced effect through masking. Birds, like humans and other animals, employ a range of short-term behavioral strategies, or adaptations, for communicating in noise to increase efficiency. Care should be taken, however, in extrapolating this data about the effects of noise on other species. Staff identified various studies that indicated traffic noise and noise pollution have a negative effect on wildlife. Blickley and Patricelli (2010) reviewed the impacts of anthropogenic noise on wildlife. Acute impacts include physiological damage, masking of communication, disruption of behavior, and startling. In addition to the acute effects of noise, animals may suffer chronic effects, including elevated stress levels and associated physiological responses. Though the study mostly focused on birds, it also discussed reptiles and amphibians (Blickley and Patricelli 2010).

Operational related noise impacts could be less in duration and frequency than construction related noise impacts. However, certain activities could result in high noise levels. Steam blow (steam venting) would occur during the generating facility's commissioning activities and would generate infrequent and elevated noise. Steam blow is effective at cleaning out accumulated dirt, rust, scale, and debris from the steam system. Periodical elevated noise levels associated with generating facility or well operations could result in an impact to bird species.

To reduce any noise-related impacts to birds, staff proposes **NOISE-4** (Operational Noise Restrictions), **NOISE-5** (Occupational Noise Survey), **NOISE-6** (Construction and Demolition Noise Restrictions), **NOISE-7** (Steam Blow Restrictions), and **NOISE-8** (Pile Driving) as described in **Section 5.9 Noise and Vibration**. Though these measures are proposed for human receptors, the adoption of these measures would also reduce impacts to birds during operations. Specifically, these noise COC/MM would ensure operation of the project would not cause ambient noise levels from generating facility operations to exceed 43 dBA, would require an occupations noise study to identify any noise hazardous areas within the generating facility, restrict noisy construction activities to specific timeframes, limit noise from steam blowers through mufflers or silencers, and require pile driving to be conducted in a manner that reduces noise and vibration. In addition, staff proposed **BIO-14** (Yuma Ridgway Rail Species Noise Assessment and Abatement Plan) which would require the preparation of a noise assessment and abatement plan that ensures noise levels at marshes occupied by marshland species never exceed 60 decibels during the breeding season or 80 decibels during the non-breeding season. With the implementation of these noise COC/MM, construction impacts to birds from noise would be reduced to less than significant.

Nitrogen Emission and Deposition Impacts. Nitrogen deposition (N-dep) is the input of NOx and ammonia (NH3) "atmospherically derived pollutants", primarily nitric acid (HNO3), from the atmosphere to the biosphere. The sources of these pollutants are primarily vehicle and industrial emissions, including power generation. Operation of the project's production testing unit (PTU), mobile testing unit (MTU), and cooling tower

would result in emissions of oxides of nitrogen (NOx). Most of the emissions would be from the cooling tower, which is consistently running during operations.

Increased N-dep in nitrogen-poor habitat can alter plant communities and allow the proliferation of non-native species, which crowds out native species (Fenn et. al 2003; Weiss 2006). There is also supportive evidence that N-dep may have deleterious effects on threatened and endangered species, particularly in San Francisco Bay area and southern California, though there is a high degree of uncertainty about the precise role of N-dep on listed species. Examples of threatened and endangered species that may be affected by N-dep include butterflies that rely on specific host plants, reduced diversity of food sources for desert tortoise, and special-status plant species that rely on shrub, forb, and grassland communities (Fenn et. al 2003). Threats to sensitive species habitat from noxious weeds and altered plant communities are exacerbated by nitrogen fertilization, and the deposition of additional nitrogen in an already stressed ecosystem would be a potentially significant indirect impact.

Staff considered protected areas and designated critical habitat within a six-mile radius in the analysis of N-dep from the project. It has been staff's experience that, by the time the plume from a conventional power plant/generating facility has traveled this distance, in-plume concentrations become indistinguishable from background concentrations. Further, staff considered habitat modification to protected areas and designated critical habitat to be a potentially significant effect if these communities were known to be sensitive to N-dep. However, there is no designated or proposed critical habitat for federally listed species within six miles of the project area. There are no known designated sensitive habitats within six miles of the project area, and there is only one CNDDB rare plant record from 1996 within the six-mile buffer. Areas that encompass the six-mile buffer include existing agricultural, a portion of the Salton Sea, and a small portion of sandy dune habitat near the edge.

Significant regional protected areas within six miles of the proposed generating facility location include the NWR, the Imperial Wildlife Management Area (IWMA) (Wister and Hazard), the IID Managed Marsh Complex, and the Niland Ranch Wildlife Habitat Foundation (national wildlife refuge certified by the National Wildlife Federation). The Salton Sea SRA, IWMA Finney-Ramer plot, and the New River are not within six miles of the proposed generating facility. Alamo River and the Salton Sea are important water bodies, and a portion of these features occur within six miles of the proposed generating facility. Iodine bush scrub is considered a sensitive natural community by CDFW and was also considered in this analysis, and is discussed in further detail under Criterion b. Given that the only verified location of iodine bush scrub was within the survey area for the geothermal project, that is the only area considered within six miles of the project.

One approach for quantifying N-dep is through critical load, which is defined as the input of a pollutant below which no detrimental ecological effects occur over the long-term according to present knowledge. Both freshwater and estuarine intertidal wetlands tend to be N-limited ecosystems. Most freshwater wetlands (such as marshes) tend to have relatively closed water and N cycles and are therefore more sensitive to N deposition than

estuarine wetlands. Salt marsh habitat tends to have a higher critical load than other ecosystems due to its open nutrient cycles that are less affected by atmospheric deposition than other nitrogen loading sources (Pardo et. al. 2011).

Pardo et. al 2011 summarizes current research relating to atmospheric N-dep effects on terrestrial and freshwater ecosystems modeled for different ecoregions within the United States. Critical load for Mediterranean California communities is estimated to be in the range of 7.8-10 kilograms nitrogen per hectare per year (kg N/ha/yr) for coastal sage scrub, 7.8-9.2 kg N/ha/yr for coastal sage scrub (southern California), 3-6 kg N/ha/yr for chaparral (lichens), and 10-14 kg N/ha/yr for chaparral (oak woodlands, Central Valley). Critical load for wetland communities is estimated to be in the range of 2.7-13 N/ha/yr and 6.8-14 N/ha/yr for freshwater wetlands, 63-400 N/ha/yr for intertidal salt marshes, and 2 N/ha/yr for western lakes (Pardo et. al. 2011). Staff used the estimate of 7.8-9.2 kg N/ha/yr as the critical load for iodine bush shrub and the Niland Ranch Wildlife Habitat Foundation; and 2.7-13 kg N/ha/yr for marshland habitat (IWMA and IID managed areas) and freshwater rivers (Alamo River, New River). Staff conducted a literature review and was unable to determine specific N-dep critical load estimates for the Salton Sea. As such, an estimate of 63-400 N/ha/yr was used for the Salton Sea given its high salinity. Table 5.2-4 provides the minimum and maximum kg of Nitrogen per hectare per year (kg N/ha/yr) at each of the protected areas.

TABLE 5.2-4 NITROGEN DEPOSITION (KG N/HA/YR) BASELINE ESTIMATES, PREDICTED VALUES FROM OPERATIONS, AND CRITICAL LOAD ESTIMATE AT EACH OF THE PROTECTED AREA WITHIN SIX MILES OF THE GENERATING FACILITY LOCATION

Protected Area	Critical Load Estimate (kg N/ha/yr)	CMAQ/EQUATES Baseline N Dep estimates (kg N/ha/yr)	Min/Max AERMOD predicted value from Operations (kg N/ha/yr)
NWR[1]	7.8-9.2 (scrub) 2.7-13 (marsh)	6-7	0.1-2
Salton Sea SRA	N/A	NA	-outside 6 miles-
IWMA Wister	2.7-13	2.59	0.1-1.0
IWMA Finney-Ramer	N/A	NA	-outside 6 miles-
IWMA Hazard	2.7-13	6-7	1-30
IID Managed Marsh Complex	2.7-13	6-7	2-5
Salton Sea	63-400	6-7	0.1-3
Alamo River	2.7-13	6-7	0.1-3
New River	N/A	N/A	-outside 6 miles-
Iodine bush scrub	7.8-9.2	6-7	0.5-20
Niland Ranch WHF, Inc.	7.8-9.2	2.59	0.1-0.5

1 NWR includes exposed playa, iodine bush shrub habitat, and marshlands.

Impacts could potentially occur if the emissions from the project in conjunction with baseline nitrogen deposition levels exceeded the critical load for the community. For a baseline nitrogen deposition estimate, staff used the Community Multiscale Air Quality

(CMAQ) modeling system (v5.3.2; data 2002-2019; USEPA 2024a) and the EPA's Air QUAlity TimE Series (EQUATES) modeling system (v1.0: Emissions; data 2021; USEPA 2024b). These models provide estimates of ozone, particulates, toxics, and acid deposition. Baseline nitrogen deposition at the proposed generating facility is estimated to be between 6.04-6.41 kg N/ha/yr. Nitrogen deposition is greatest in the vicinity of the project (6.04 kg N/ha/yr) and south of Calipatria (7.31 kg N/ha/yr); and is lowest in the Salton Sea (2.63-2.65 kg N/ha/yr) and near Mundo (2.59 kg N/ha/yr). Baseline N-dep level estimates for each community are provided in Table 5.2-4.

Staff used the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) (USEPA 2023a) to establish N-dep values at the proposed generating facility. The project's estimated contributions to existing nitrogen deposition would be the highest at and around the generating facility site and could reach 30 kg N/ha/yr at the IWMA Hazard Tract. The iodine bush scrub community could reach 20 kg N/ha/yr in some areas. Nitrogen deposition from the project would be above critical load levels at the Hazard Track and iodine bush scrub areas. Critical load levels could also possibly be met at IID Managed Marsh Complex, though the load threshold is borderline given estimated range of nitrogen deposition. Baseline N Dep levels for these areas are between 6-7 kg N/ha/yr, showing that baseline conditions are already approaching critical load levels.

Critical load thresholds for N-dep in the Salton Sea are not anticipated to be met, though information on nitrogen deposition in the Salton Sea is limited. Staff reviewed the Salton Sea Management Plan (CNRA 2018) and the Salton Sea Monitoring Implementation Plan (CNRA 2022) for information regarding nitrogen deposition impacts to the Salton Sea. Emission concerns in both the Management Plan and Implementation Plan referenced dust from exposed playa at the Salton Sea, which is a source of particulate matter. The Implementation Plan mentioned that the Salton Sea is considered a "eutrophic" lake, one reason being its high concentrations of nutrients, particularly nitrogen and phosphorus, which are byproducts of agricultural fertilizer. Monitoring of ozone precursor and other combustion emissions (ozone, NOx, sulfur dioxide, hydrogen sulfide, and ammonia) is deemed a low priority in the gaseous pollutants monitoring indicators for air quality, unless very large-scale restoration activities with substantial numbers of heavy-duty equipment are contemplated.

Nitrogen deposition would not affect any federally designated critical habitats or designated sensitive habitats within six miles of the project. Potential impacts to the 1906 rare plant population at the edge of the six-mile buffer, if extant, would be 0.1-2, which is considered negligible. Staff conducted a literature search for management plans and master plans that address nitrogen deposition at the NWR, IWMAs, IID Management Marshes, New River, and Alamo River. Management plans were either unavailable or did not include information regarding baseline N-dep levels or potential for N-dep impacts.

The California 2020-2022 Integrated Report provides data on surface waterbodies that were assessed and placed in one of five Integrated Report Condition Categories based on the waterbody's ability to support beneficial use(s) (Water Boards 2024). Waterbodies

that are listed 4a, 4b, and 5 are considered "listed" or "impaired". The Alamo River is listed as 3030(d) impaired waterbodies (Category 5) for many different pollutants. Pollutants in these rivers include ammonia, which includes "Nitrogen, ammonia (Total Ammonia)". The Salton Sea is also a Category 5 listed 303(d) impaired waterbody, and is also listed for "Nitrogen, ammonia (Total Ammonia)." All irrigation canals and ditches in the area and most other waterbodies south of the Salton Sea, with the exception of Ramer Lake and Finney Lake, are also listed as impaired for various pollutants.

There are no designated critical habitats or sensitive habitats that would be impacted by increased N-dep from generating facility operations. Nitrogen deposition would have no impact on designated critical habitats or designated sensitive habitats. Regionally sensitive habitats and aquatic resource features could meet critical load levels due to emissions from generating facility operations. Many of these habitats already contain existing levels of invasive plant species from surrounding agricultural land use and urbanization. Invasive species are actively managed by the NWR, which could have some of the highest nitrogen deposition contributions. Communities that may meet critical loads are already subjected to nitrogen deposition from existing generating facility operations, agricultural equipment usage, and urban development, resulting in baseline conditions between 6-7 kg N/ha/yr. There are no known populations of special-status plant species in the project area. Though freshwater communities where critical load for nitrogen deposition is met could support threatened or endangered wildlife species, these wildlife species are not heavily reliant on specific plant species. Most of waterbodies in the area are considered to be 303(d) impaired waters. Given the existing disturbance and land use in the area, N-dep impacts are considered less than significant.

Invasive Species. There is a high occurrence of invasive species within the project area, particularly within the canals and drains and tamarisk thickets communities that support aquatic vegetation. The Refuge actively manages invasive salt cedar and sesbania (*Sesbania punicea*), which thrive in moist soil. The area is subject to historic and ongoing disturbance from agricultural land use, irrigation, and existing geothermal facilities. Operational activities would be limited to existing access roads and facilities; however, these could provide avenues for introducing noxious and invasive weeds. Though several communities are dominated by invasive species, spread of these or other invasive species into native habitat would be considered a significant impact. The introduction and spread of invasive weeds can have detrimental effects on riparian habitat and aquatic systems that support sensitive wildlife species. Invasive weeds can be introduced and spread through transport on uncleaned vehicles and equipment moving from areas within the project area or from areas outside of the general region. Impacts to aquatic habitats can also occur through the introduction or spread of invasive wildlife or pathogens. This typically occurs when equipment or vehicles are used in infested areas and not cleaned prior to moving to new locations. New Zealand mudsnails (*Potamopyrgus antipodarum*), Quagga Mussel (*Dreissena rostriformis bugensis*), or Zebra Mussel (*Dreissena polymorpha*) were not found during the surveys. Quagga mussels, an invasive mussel that can colonize freshwater surfaces, was found in the Colorado River at Imperial Dam in Imperial County in 2008 (CDFW 2021; CDFW 2024g). Quagga mussels can spawn

multiple times a year and consume large quantities of plankton that form the base of the food web, outcompeting native species.

To reduce the spread of invasive plants and wildlife, staff proposes modifications to applicant's weed measures (TN250678) by adding control of aquatic invasive species, specifying the areas that would require revegetation, adding restoration techniques, and including verification requirements. These modifications have been incorporated into staff's proposed **BIO-10** (Invasive Species Management Plan), **BIO-11** (Closure, Revegetation, and Rehabilitation Plan), and **BIO-4** (General Conservation Measures). These COC/MM would manage weeds, restore disturbed areas with native or sterile non-native species, and reduce cultivation of invasive species on temporarily disturbed soils, and provides guidance on best management practices for the control of invasive species. With the implementation of these COC/MM, impacts from invasive species would be reduced to less than significant.

Decommissioning. Decommissioning activities can result in similar levels of disturbance as construction activities due to the increased levels of human presence and noise during clean-up and removal, or accidental spill or release of hazardous liquids or materials during clean-up and transport. applicant design measures during decommissioning include the preparation of a Decommissioning Plan that would be submitted to CEC for review and approval as specified under **COM-15** (Facility Closure Planning) in the **Compliance Conditions and Compliance Monitoring Plan** section. The decommissioning plan would include activities required to clean the facility; removal and disposal of hazardous sludge, liquid and materials at appropriate landfills; and "clean closed" brine ponds in accordance with RWQCB waste discharge requirements. With the incorporation of this COC/MM, impacts from decommissioning would be considered less than significant.

b. Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Construction

Less Than Significant with Mitigation Incorporated. An analysis of permanent and temporary impacts to vegetation communities and land cover types was conducted using the applicants GIS data. The applicant's GIS data includes the proposed project site plus a 500 feet buffer to account for unforeseen design changes (per. comm. Jacobs). This analysis determined that there would be temporary/permanent impacts to approximately 743.28/6.18 acres of agricultural lands, approximately 340.89/99.25 acres of barren land, developed, and disturbed (with and without vegetation) habitat, approximately 25.56/22.85 acres of riparian habitat, and approximately 20.02/17.91 acres of native habitat, by removing or substantially altering the soils and vegetation for the placement of project facilities and related infrastructure. In addition, approximately 18.95/1.03 acres of temporary/permanent could occur to canals or drains. Temporary and permanent

impacts to vegetation communities and other land cover types within the project area are detailed in Table 5.2-5.

The applicant has stated in response to data requests that the project would have no impact on IID canals and drains other than crossing with above ground pipes and gen-tie lines (TN250679; TN254015). The applicant has stated that project features were specifically located to avoid impacts to aquatic resources, such as irrigation supply and drain canals, the Alamo River, and the Salton Sea. The irrigation and drain canals represent a major part of the IID's operational infrastructure and impacts to these features could affect their ability to service their customers. The applicant has included design measures to avoid potential impacts to these aquatic resources; therefore, CEC staff concludes that permanent impacts would not occur to canals and drains. Given the potential for design changes, this analysis accepts temporary and permanent impacts could occur to other aquatic features, riparian or marshland habitat.

TABLE 5.2-5 TEMPORARY AND PERMANENT IMPACTS TO VEGETATION COMMUNITIES AND OTHER LAND COVER TYPES WITHIN THE PROJECT BIOLOGICAL STUDY AREA BASED ON APPLICANT GIS AND ASSOCIATED BUFFER AREAS

Vegetation Communities and Other Land Cover Types within the project area	Impact Type (acres)										Total Impacts (acres)	
	Borrow Pit	Constr. Laydown & Parking	Construction Camp	Gen-Tie Pole	Pipeline	Generating Facility Location	Pulling Site	Switching Station	Water Supply Pipeline	Well Pad	TEMPORARY	PERMANENT
Agriculture	44.71	499.00	192.92	0.20	--	--	--	5.67	--	0.77	743.28	--
	--	--	--	0.03	--	--	--	6.15	--	--	--	6.18
Barren Lands	--	--	--	--	1.38	--	--	--	0.14	--	1.53	--
	--	--	--	--	1.24	--	--	--	--	--	--	1.24
Canals and Drains*	3.60	0.78	6.01	0.74	2.63	--	0.07	0.50	1.16	3.45	18.95	--
	--	--	--	0.06	0.76	--	--	--	--	0.22	--	1.03
Developed	--	4.98	--	0.44	1.45	1.01	0.03	--	0.43	3.44	11.78	--
	--	--	--	0.06	0.30	4.49	--	--	--	0.68	--	5.53
Disturbed with Vegetation	117.26	45.55	7.47	2.47	8.94	16.35	0.31	2.33	6.37	22.92	229.95	--
	--	--	--	0.27	11.77	50.04	--	--	--	17.32	--	79.40
Disturbed with No Vegetation	71.61	--	--	--	4.54	--	--	--	9.81	13.19	99.16	--
	--	--	--	--	3.85	--	--	--	--	10.46	--	14.32
Tamarisk Thickets/Invasive Southwest Riparian Woodland and Shrubland	--	0.93	--	0.90	--	--	0.03	--	--	3.32	5.18	--
	--	--	--	0.14	--	--	--	--	--	5.29	--	5.43
Typha Herbaceous Alliance (Cattail Marsh)/N. American Arid West Emergent Marsh	0.13	--	--	0.37	2.85	--	--	--	0.22	16.81	20.38	--
	--	--	--	<0.01	3.64	--	--	--	--	13.78	--	17.42
	--	3.66	--	1.98	4.26	2.49	--	--	--	7.63	20.02	--

TABLE 5.2-5 TEMPORARY AND PERMANENT IMPACTS TO VEGETATION COMMUNITIES AND OTHER LAND COVER TYPES WITHIN THE PROJECT BIOLOGICAL STUDY AREA BASED ON APPLICANT GIS AND ASSOCIATED BUFFER AREAS

Vegetation Communities and Other Land Cover Types within the project area	Impact Type (acres)										Total Impacts (acres)	
	Borrow Pit	Constr. Laydown & Parking	Construction Camp	Gen-Tie Pole	Pipeline	Generating Facility Location	Pulling Site	Switching Station	Water Supply Pipeline	Well Pad	TEMPORARY	PERMANENT
Iodine Bush Scrub/North American Warm Desert Playa	--	--	--	0.17	4.15	3.53	--	--	--	10.05	--	17.91
Total (Temporary)	237.32	544.91	206.40	7.09	26.06	19.85	0.45	8.50	18.13	71.53	**1,150.23**	**--**
Total (Permanent)	-0-	-0-	-0-	0.72	25.71	58.06	-0-	6.15	-0-	57.81	**--**	**148.45**

*This analysis concludes that canals and drains would not be impacted. Temporary and permanent impacts to canals and drains are shown for informational purposes.

Temporary impacts areas include the generating facility, borrow pit, construction laydown and parking, construction camp, gen-tie poles, pipelines, pulling site, switching station, water supply pipeline, and well pads. Permanent impacts areas include the proposed generating facility, gen-tie poles, conveyance pipelines, water pipelines, switching station, and well pads.

Direct impacts to native vegetation communities and sensitive habitats would include the removal of vegetation, the loss or disruption of native seedbanks, or exposure to fugitive dust. Indirect impacts to native vegetation communities and sensitive habitats could include type conversion, long-term alterations to hydrology, and degradation of habitat from invasive weeds. Most of the temporary and permanent impacts would occur in agricultural, barren, or developed/disturbed land cover types (Table 5.2-5). The project area is in a region that has historically been used for widespread agricultural purposes. In addition, some of the sites have been historically flooded and supported various open water and marsh communities that were used for recreational purposes including duck hunting. Changes in water allocations and water management strategies have reduced access to surface waters at these sites which has resulted in substantial land use changes in the region. Previously inundated areas are now dry and are not likely to receive surface flows in the future. These areas are now barren or support remnant halophytic vegetation such as iodine bush scrub that has recruited into some areas as the surface waters declined. The loss of surface water has also resulted in the reduction of the Salton Sea. The loss of previously inundated areas removes important wetland habitat for a variety of birds in the region however the loss is not project related. Impacts to the previously disturbed lands would not be significant because these lands provide only minimal vegetation structure and diversity, and because the soils have been disturbed or altered by prior land uses.

Agricultural lands are used by a wide variety of wildlife. Many species of bird's forage within active fields or along habitat edges where farmlands are adjacent to natural areas. Burrowing owl (*Athene cuniculata*) are commonly found along the margins of these areas and are a conspicuous species in the region. In addition, agricultural lands can be important foraging habitat for migrating and wintering birds depending on the crop. However, use of these areas varies depending on the crop rotation and existing management practices including herbicide and/or pesticide use and the timing of the harvest.

Riparian communities in the project area include marshes, ponds, and linear drains supporting a variety of wetland and riparian vegetation. While these habitats constitute only a small fraction of habitat in the area and a low percentage of the total regional landscape, they support a disproportionately high number of species including State and federally listed species. This includes the riparian habitat at the Morton Bay area adjacent to the generating facility site, which is known to support Yuma Ridgway rail; canals and drains that drain into Morton Bay that support desert pupfish, and the nearby Alamo River, which can support a variety of species. The removal of riparian vegetation or exposure to dust and off-site sediment transport can affect water temperatures and

chemistry in the drains and can increase surface runoff, causing turbidity and sedimentation into these features, potentially resulting in adverse effects to local aquatic invertebrates, fish, and amphibians.

Implementation of the proposed project also has the potential to result in direct and indirect impacts to native vegetation communities and sensitive habitats. Native communities support native floral and fauna and ecosystem functions. Iodine bush scrub has a state rank of S3, which is considered a sensitive natural community by CDFW. As such, the loss of iodine bush scrub would result in a significant impact under CEQA.

Direct impacts could also occur if invasive or noxious weeds become introduced into an area or are spread from one area to another during construction of the proposed project. Several invasive or noxious weeds, as defined by the California Invasive Plant Council (CAL-IPC), exist within or near the project area. Some species that are widespread and include salt salt cedar (*Tamarix* sp.), Bermuda grass (*Cynodon dactylon*), giant reed (*Arundo donax*), golden wattle (*Acacia pycnantha*), Kentucky bluegrass (*Poa pratensis*), London rocket (*Sisymbrium irio*), rabbitfoot grass (*Polypogon monspeliensis*), Russian thistle (*Salsola tragus*), and sesbania (*Sesbania exalta*). The introduction or spread of invasive or noxious weeds would be primarily related to the use of vehicles or equipment contaminated with nonnative plant seed. Weed seeds are often spread on equipment or clothing by management or maintenance personnel. At the completion of the project the temporary disturbance areas including borrow pit, construction laydown and parking area, and construction camps would be removed and the sites could become colonized by invasive weeds or become a source of fugitive dust. In addition, weeds can quickly colonize disturbed areas pose a risk to adjacent habitats at the conclusion of the project.

The permanent conversion of developed lands, barren areas, and agricultural lands to support the proposed project facilities would not be considered significant under CEQA. These areas remain common in the region and are agricultural lands are typically subject to routine anthropogenic disturbance. Potential impacts to the special-status species and birds that use these lands are addressed under Criterion a. The loss of riparian habitats and native vegetation communities, and the risk from the colonization of invasive weeds or exposure to fugitive dust, would be considered a significant impact under CEQA.

To offset temporary impacts to vegetation communities, staff proposes modifications to applicant's Closure, Revegetation and Rehabilitation Plan measure (TN250679) by specifying the areas that would require revegetation, adding restoration techniques, and including verification requirements. These modifications have been incorporated into staff's proposed **BIO-11** (Closure, Revegetation, and Rehabilitation Plan), which requires the applicant to develop a site restoration plan for temporarily disturbed areas after construction, including reverting these areas back to the previous land use, such as agricultural production. Staff also proposes **BIO-17** (Habitat Compensation or Restoration Plan), which would require habitat compensation and habitat restoration for permanent impact to native, semi-natural, and riparian habitat, including tamarisk thickets, Typha herbaceous alliance, iodine bush scrub, and desert holly scrub. In addition, staff proposes modifications to applicant's measures (TN249737, AFC Section

5.2.3.5) to include clarifying language on verification and documentation. These have been incorporated into staff proposed **BIO-21** (Biological Resources Mitigation Implementation and Monitoring Plan).

To reduce impacts from invasive species, staff proposes modifications to applicant's weed measures (TN250678) by adding control of aquatic invasive species, specifying the areas that would require revegetation, adding restoration techniques, and including verification requirements. These modifications have been incorporated into staff's proposed **BIO-11** (Closure, Revegetation, and Rehabilitation Plan), and **BIO-10** (Invasive Species Management Plan). These COC/MM would manage invasive species, restore disturbed areas with native or sterile non-native species, and reduce cultivation of weeds on temporarily disturbed soils.

To reduce impacts from fugitive dust, staff proposes dust control COC/MM **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement) as described in **Section 5.1 Air Quality** as part of air quality requirements which would prevent the sites from becoming a source of fugitive dust.

In addition, staff proposes modifications to applicant's measures (TN249723, AFC Section 5.2.3.1.4, 5.2.3.1.6, 5.2.3.1.7, and 5.2.3.1.14) based on guidance provided by CDFW and to include clarifying language. These have been incorporated into staff's **BIO-5** (Worker Environmental Awareness Program), which would require worker training and limiting work to approved areas, and **BIO-4** (General Conservation Measures), which would require best management practices around sensitive habitats. With the implementation of these COC/MM, impacts would be reduced to a less than significant level.

Operation/Decommissioning

Less Than Significant. Operation of the generating facility, including maintenance activities, and decommissioning is not anticipated to result in the removal or conversion of native vegetation, and would not further disrupt wildlife activities through vegetation removal. The potential for the spread of invasive or noxious weeds could occur through the use of vehicles in the project area. However, vehicle use would be limited to existing roads and disturbed areas which would minimize the risk of introducing noxious and invasive weeks. Therefore, indirect impacts would be considered less than significant.

As discussed under Criterion a, Operations, Nitrogen deposition (N-dep) is the input of NOx and ammonia (NH3) "atmospherically derived pollutants", primarily nitric acid (HNO3), from the atmosphere to the biosphere. Operation of the project's production testing unit (PTU), mobile testing unit (MTU), and cooling tower would result in emissions of oxides of nitrogen (NOx). Nitrogen deposition (N-dep) can allow the proliferation of non-native species, which crowds out native species. The projects estimated contributions to existing N-dep would be the highest at and around the generating facility site and could reach 30 kg N/ha/yr at the IWMA Hazard Tract. The iodine bush scrub community could reach 20 kg N/ha/yr in some areas, which is above critical load levels and could result in the proliferation of non-native species. However, these communities are also

already subjected to nitrogen deposition from existing generating facility operations, agricultural equipment usage, and urban development, resulting in baseline conditions between 6-7 kg N/ha/yr. Many of these habitats already contain existing levels of invasive plant species from surrounding agricultural land use and urbanization. Invasive species are actively managed by the NWR. Given the existing disturbance and land use in the area, N-dep impacts to iodine bush scrub are considered less than significant.

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

Construction

Less Than Significant with Mitigation Incorporated. The applicant's AFC (TN249725) and the Approved Jurisdictional Determination Request (TN252694) provided details on an aquatic resources delineation conducted for the project. The aquatic resources delineation survey was based off NWI and NHD mapped waters. The aquatic resource delineation identified a total of approximately 18.14 acres of wetlands (two palustrine emergent and three palustrine scrub-shrub), 39.23 acres of other waters (two salt flats, an excavated salt flat, an excavated pond, an excavated lake, and Morton Bay) and 1.41 acres (1,598 linear feet) of watercourses (one perennial and one intermittent) in the study area.

The location of the injection well pad for future expansion along Red Hill Road area (Tamarisk thickets and cattail marsh communities) consists of wetlands, other waters, riparian habitat, and a ditch watercourse. The Alamo River watercourse and adjacent wetlands are also identified in this area. South of W Schrimpf Road near the location of the injection well pads (cattail marsh community and disturbed with vegetation land use), riparian habitat and other waters were identified. North of McDonald Road, at the location of the production well sites (disturbed with vegetation land use), other waters and wetlands were identified. All wetlands identified had a continuous surface connection with the Alamo River, Morton Bay, and/or the Salton Sea. Other aquatic resources meet two of the three USACE wetland delineation parameters and may qualify as waters of the U.S. (WOTUS) or waters of the state (WOTS). These areas include Morton Bay, two salt flats, and three excavated waterbodies (excavated lake, waterfowl hunting pond, and excavated salt flat). Some of these features have a continuous surface connection with Morton Bay, while others do not.

Staff acknowledges that there has been a decline in the water levels in the Salton Sea over the last several decades due to climate fluctuations, agricultural conservation measures, cropping practices, and decreased inflow from Mexico, which results in a unique situation for the Salton Sea area. Staff consulted with CDFW regarding the jurisdiction of areas that were inundated in the past, but are not currently inundated, and may not become inundated in the future. CDFW determined that impacted areas that were inundated in the past, but are currently dry, would be subject to CDFW jurisdiction,

but no compensatory mitigation would be required for permanent impacts. Staff concurs with this approach and defines "currently dry" as being dry for a period of 3 years or longer and does not support viable riparian vegetation.

CDFW also requested confirmation that the hydrologic connection for previously inundated area has been permanently severed (i.e., there is no plan for future inundation of dry areas). As discussed in the methods section under Aquatic Resources, the IID O-N Drain Connector project resulted in direct and indirect impacts to wetlands that would require restoration. Based on the project boundaries, staff concurs that these disturbed wetlands are not within potential disturbance areas and would not be impacted by the project. Access roads and berms separate the IID disturbed wetland area from the project site, and therefore would not result in any additional indirect impacts due to severed hydrology. During a meeting with IID and CEC staff, IID stated that terminus of drains that are no longer actively managed may intentionally be flooded, which results in vegetation growth and additional spread of water. As such, staff would implement the aforementioned approach that compensatory mitigation would only be required for permanent impacts to aquatic resources and defines "currently dry" as being dry for a period of three years or longer and does not support viable riparian vegetation.

An analysis of permanent and temporary impacts to vegetation communities and land cover types using applicant GIS data (see Criterion b). The applicant's GIS data includes the proposed project site plus a 500 feet buffer to account for unforeseen design changes (per. comm. Jacobs). This analysis determined that there could be temporary/permanent impacts to 5.18/5.43 acres of impacts to tamarisk thickets (riparian habitat) and 20.38/17.42 acres of impacts to Typha herbaceous alliance (cattail marsh). Tamarisk thickets (riparian) areas would be subject to temporary impacts from the construction laydown and parking, gen-tie poles, pulling site, and well pads. Permanent impacts to Tamarisk thickets would include gen-tie poles and well pads. Cattail marsh would be subject to temporary impacts from the burrow pit, gen-tie poles, pipeline, water supply pipeline, and well pads. Permanent impacts to cattail marsh would include gen-tie poles, pipelines, and well pads. As mentioned under criterion b, this analysis concludes canals and drains would not be impacted because they are managed by IID. The applicant has stated in response to data requests that the project would have no impact on IID canals and drains other than crossing with above ground pipes and gen-tie lines (TN250679; TN254015).

Given the potential for design changes, this discussion accepts temporary and permanent impacts could occur to all 58.78 acres of aquatic resources and riparian areas. Temporary and permanent impacts to these features could include elimination or alteration of hydrological, biogeochemical, vegetation and wildlife functions. Since the entire area ultimately drains into the Salton Sea, impacts to these water features could indirectly impact the sea as a result of alterations to the existing topographical and hydrological conditions. Indirect impacts could also occur from the degradation of riparian and marshland habitat due to the introduction and spread of noxious and invasive weeds. The introduction and spread of noxious and invasive weeds can result in widespread and long-

term indirect impacts by outcompeting and displacing native vegetation and modifying hydrological conditions and soil chemistry.

Impacts to wetlands and waters would require federal and state permits. Under the federal Clean Water Act, a federal (Section 404) and state (Section 401) permit is required for any activity that may result in a discharge into a waters of the U.S. (WOTUS). In accordance with the Porter-Cologne Water Quality Act and the May 2020 *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (State Wetland Procedures) a waste discharge requirement (WDR) is required for impacts to waters of the state (WOTS) that do not have a federal nexus. Fish and Game Code section 1602 requires notification to CDFW prior to any alteration to a river, stream or lake, requiring a Lake or Streambed Alteration Agreement. Conditions for a Lake or Streambed Alteration Agreement are included as Conditions of Certification.

To reduce impacts to aquatic resources, staff proposes modifications to applicant's measures (TN250679, AFC Section 5.2.3.1.15, 5.2.3.1.16, and 5.2.3.1.18) to consolidate the measures, specify mitigation requirements for permanent impacts to aquatic resources, and provide verification requirements. These have been incorporated into staff's proposed **BIO-22** (Provide Evidence of Applicable Jurisdictional Waters Permits) to minimize and offset direct and indirect impacts to state waters to less than significant levels and ensure compliance with U.S. Army Corps of Engineers, State Water Quality Control Board and CDFW regulations that provide protection to aquatic resources. These measures include restoration of temporarily impacted areas and acquisition and enhancement of permanently impacted areas up to 58.78 acres. Acquisition and enhancement for permanently impacted areas with in-kind waters shall be located within the Salton Sea watershed. **BIO-22** applies as a COC to project components that fall under CEC's license and as an MM for project components requiring permits/authorizations by local or other jurisdictions.

In addition, staff proposes modifications to applicant's measures (TN249737, AFC Section 5.2.3.6, 5.2.3.7, and 5.2.3.14) based on guidance provided by CDFW and to include clarifying language. These have been incorporated into staff's proposed **BIO-4** (General Conservation Measures), which would require delineation of the work area, implementation of a SWPPP and erosion control measures, staging on existing roads or disturbed areas, restriction of activities near aquatic features, would require vehicles to be cleaned and free of mud and debris, and erosion control measures be certified weed free. To reduce impacts to water resources, staff proposes erosion control **WATER-1** (NPDES Construction Permit Requirements), and **WATER-3** (Waste Discharge Requirements) as identified in **Section 5.16 Water Resources**. To reduce dust and the risk of construction related materials from entering aquatic features, staff proposes **HAZ-1** and **HAZ-2**, as identified in **Section 5.7 Hazards, Hazardous Materials/Waste, and Wildfire**, which would require the preparation and approval of a HMBP and a SPCC. With the implementation of these conditions, impacts to aquatic resources would be reduced to less than significant.

Operation/Decommissioning

Less Than Significant. Because operations would not include any additional ground-disturbing activities, direct impacts to aquatic features would already be mitigated, and erosion control requirements would already be implemented. As such, no additional direct impacts would occur. The potential for the continued spread of invasive or noxious weeds could occur through the use of vehicles in the project area. However, vehicle use would be limited to existing roads and disturbed areas and therefore would minimize the risk of introducing noxious and invasive weeks. Therefore, indirect impacts from operational activities would be considered less than significant.

applicant design measures during decommissioning include the preparation of a Decommissioning Plan that would be submitted to CEC for review and approval as specified under **COM-15** (Facility Closure Planning) in the **Compliance Conditions and Compliance Monitoring Plan** section. The decommissioning plan would include activities required to clean the facility; removal and disposal of hazardous sludge, liquid and materials at appropriate landfills; and "clean closed" brine ponds in accordance with RWQCB waste discharge requirements. With the incorporation of this COC/MM, impacts from decommissioning would be considered less than significant.

d. Would the project 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 wildlife nursery sites?

Construction/Operation/Decommissioning

Less Than Significant. There are no Essential Habitat Connectivity Areas at the project site, the closest approximately 10 miles to the northeast in the Chocolate Mountains. Most of the project area has an Areas of Conservation Emphasis (ACE) terrestrial connectivity of Rank 1 "limited terrestrial connectivity opportunity", with the exception of the northernmost section that has Rank 3 "connections with implementation flexibility" (important but not identified as core areas). The project would not change these designations. The project site and surrounding area already reside in highly fragmented habitat. Generating facility construction or fencing is not expected to limit or impede foraging activity or general movements of wildlife species.

The Salton Sea is an important link to the Pacific Flyway; and the Salton Sea and agricultural areas southeast of the Salton Sea are considered Important Bird Areas (IBAs) of global conservation priority level. Though there are numerous management implications surrounding the Salton Sea that affect birds and other wildlife, such as increased salinity, reduced water runoff, and concentrations of toxins, these are not project related disturbances. In addition, impacts to agricultural lands, which are known to provide suitable foraging habitat, would result in a small disturbance given the approximately 500,000 acres of total agricultural lands in Imperial County (Census of Agriculture 2017; see TN254015). The proposed project would not result in a major

alternation to the Pacific Flyway or an IBA that would result in a change in status or location of these migration corridors. Therefore, impacts would be reduced to less than significant.

e. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Construction/Operation

Less Than Significant with Mitigation Incorporated. The Imperial County Conservation and Open Space Element includes policies and action items to manage environmental resources, particularly scarce resources, and to integrate programmatic strategies to manage their integrity, function, productivity, and long-term viability (Imperial County 2016). CEC's authority subsumes other jurisdictional permitting requirements, save for CalGEM, IID, and Imperial County licensing/approval for the well fields, borrow pits, labor camps, offsite laydown areas, and switching station. Compliance with these policies and action items would be required prior to the County issuance of any permits for these aspects of the project. This would include preservation of habitat for desert pupfish and burrowing owl (Objective 2.2); use of the CEQA process to identify, conserve and restore sensitive vegetation and wildlife resources (Objective 2.4); identifying, reducing and eliminating all forms of pollutions including air, noise, soil and water (Objective 2.6); ensuring the protection of rivers and waterways (Objective 6.1); protecting and improving water quality (Objective 6.3); encouraging renewable energy projects (Objective 9.2); and coordinating with agencies to protect and restore habitat for migratory birds, desert pupfish, and other species (Objective 9.3). The Imperial County Noise Element also identifies riparian bird species as a sensitive receptor.

The project is renewable energy project that is under CEQA review, which involved agency coordination for protected species. As described in Impact Criteria a through d, the proposed project would be consistent with the Imperial County Conservation and Open Space Element and Noise Element through the implementation of **BIO-1** through **BIO-22** which would require worker training, pre-activity surveys for special-status species, pre-activity nesting bird surveys, biological construction monitoring, specific measures to protect burrowing owls and burrowing owl habitat, noise restrictions to limit disturbance to marshland birds, protections for desert pupfish and canals and drains, water quality measures and hazardous materials handing to protect water quality and prevent contamination, revegetation and restoration requirements, and reduction of fugitive dust. With the implementation of these COC/MM, impacts would be reduced to less than significant.

f. Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Construction/Operation/Decommissioning

Less Than Significant with Mitigation Incorporated. As stated in the Executive Summary of the Salton Sea Monitoring Implementation Plan (MIP; CNRA 2022), monitoring of the Salton Sea and its broader ecosystem is "aimed at reducing the amount of exposed playa, suppressing dust emissions from exposed playa, and creating habitat for key wildlife species." Further, Table 2-3 of the Salton Sea MIP lists monitoring goals, objectives, indicators, and questions for biological resources as largely pertaining to characterization of the status of: birds, fish, aquatic food web, and understanding the distribution and status of special-status wildlife species. There are several managed lands in the proximity to the project site. The project is adjacent to, but outside of, the monitored lands for the CDFW Imperial Wildlife Area Hazard Unit. The project is outside the NWR and the IID Managed Marsh Complex (Figure 1-1, Salton Sea Monitoring Implementation Plan, CNRA 2022). A proposed well pad and associated pipelines are near NWR managed lands and the Red Hill Bay Project. However, the Red Hill Bay Project was cancelled on August 30, 2023 (TN254015).

The Salton Sea Management Program Phase I: 10-Year Plan (SSMP; CNRA 2018), has the expressly stated goal of providing habitat for fish, including desert pupfish, which occur within the drainages associated with the project, several special-status bird species, and to develop and fund habitat and dust suppression projects around the Salton Sea. While the project is not required to conform with these plans and goals, staff has reviewed applicant's proposed mitigation measures and has proposed additional measures which are largely in conformance with the goals of reducing and incorporation of best management practices. Staff proposes modifications to applicant's measures (TN249723, AFC Section 5.2.3.1.6, 5.2.3.1.7, and 5.2.3.1.14) based on guidance provided by CDFW and to include clarifying language. These have been incorporated into staff's proposed **BIO-4** (General Conservation Measures).

To reduce impacts from fugitive dust, staff proposes dust control **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement) as described in **Section 5.1 Air Quality**. To reduce impacts to water resources, staff proposes erosion control **WATER-1** (NPDES Construction Permit Requirements) and **WATER-3** (Waste Discharge Requirements) as identified in **Section 5.16 Water Resources**.

In addition, staff proposes modifications to applicant's weed measures (TN250679) by adding control of aquatic invasive species, specifying the areas that would require revegetation, adding restoration techniques, and including verification requirements. These modifications have been incorporated into staff's proposed **BIO-10** (Invasive Species Management Plan), **BIO-11** (Closure, Revegetation, and Rehabilitation Plan), and **BIO-4** (General Conservation Measures). These COC/MM would manage weeds, restore disturbed areas with native or sterile non-native species, and reduce cultivation

of invasive species on temporarily disturbed soils. Implementation of these conditions required for other impacts also align with the SSMP goals and therefore would not result in significant impacts to the SSMP.

The injection well pad for future expansion along Red Hill Road is located near the Red Hill Bay Project area. The Red Hill Bay Project was awarded a Proposition 84 grant to create over 500 acres of shallow marine habitat and decrease the overall amount of dust emissions from Red Hill Bay. In June 2020, the Imperial County Air Pollution Control District (ICAPCD) issued Notices of Violation of its rules to IID and to USFWS for the Red Hill Bay wetlands habitat project site. On April 16, 2021, the ICAPCD's Hearing Board issued an Order for Abatement to IID requiring the implementation of a shallow flooding project at the Red Hill Bay project site instead of the Best Available Control Method ("BACM") air quality project proposed by IID to meet BACM requirements as set forth in ICAPCD's rules. However, the Red Hill Bay Project was canceled on August 30, 2023. In the termination agreement (TN254015, Attachment DR 171), Project Purpose and Remarks, it states, "*This project was terminated due to the inability of the Grantee and Landowner to come to an agreement regarding long-term access to the project site. Some expenditures were made to finalize project designs, but the project never broke ground and no new habitat was created*." As such, the project would not impact any created habitat associated with the Red Hill Bay Project (TN254015).

The Coachella Valley Multiple Species Habitat Conservation Plan is in Riverside County, which overlaps the northern section of the Salton Sea. The project is in Imperial County at the southern end of the Salton Sea. The project would have no impact on the Coachella Valley Multiple Species Habitat Conservation Plan.

5.2.2.3 Cumulative Impacts

Less Than Significant with Mitigation Incorporated. Cumulative impacts are defined in CEQA as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines Section 15355). Stated in another way, "a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing relating impacts" (CEQA Guidelines Section 15130 [a][1]).

The applicant identified a list of projects that were within six miles of the proposed project (AFC Appendix 5.6; TN249723). Staff developed a master cumulative project list within eight miles of the proposed project (**Section 1 Executive Summary**). These include six solar farms (one pending entitlement, three approved, one pending construction, and one under construction), one energy source mineral project (pending construction), one geothermal exploration project (entitlement process), and three geothermal projects (Elmore North, Black Rock, and Morton Bay) that are pending permitting.

Special-Status Species

Implementation of the proposed project in combination with other proposed, approved, and reasonably foreseeable projects in the region could have cumulative impacts on special status species and natural communities. Based on habitat conditions in the region, the on-going active agriculture use, and the limited plant records, cumulative impacts to special-status plant are not anticipated. Similarly, monarch butterflies and Crotch's bumblebee have a limited potential to occur in the area given the ongoing agricultural practices in the area and the limited habitat availability. The area is outside the current known range of razorback sucker. Sonoran Desert toad, lowland leopard frog, and Couch's spadefoot could occur in marshland habitat, though the potential to occur in the region is limited. Smaller patches of sandy soils could provide habitat for flat-tailed horned lizard, though habitat in the area is also limited given the extensive agriculture use. There is a low potential for Gila woodpecker to occur in the area as this species typically requires riparian forests or other large trees for cavity nests. Typical nesting habitat for western snowy plover occur along the Salton Sea margins, of which only Black Rock, Elmore North, and Morton Bay could impact. Though pelicans have historically nested in the area, records indicate a lack of nesting by pelicans over the last two decades. Future projects are not considered a cumulative impact to special-status plant species, monarch butterflies, Crotch's bumble bee, razorback sucker, Sonoran Desert toad, lowland leopard frog, Couch's spadefoot, flat-tailed horned lizard, Gila woodpecker, western snowy plover, and pelicans because the impacts are not expected to reduce the extent or population size of these species.

Desert pupfish are known to occur in the agricultural canals and drains in the region. Morton Bay, Elmore North, and Black Rock would not directly impact any IID canals or drains that could support pupfish, and therefore are not expected to result in direct mortality or injury, or impediments to movement. If impacts to desert pupfish habitat were to occur, staff recommends **BIO-9** (Desert Pupfish Protection and Relocation Plan) which would require a Desert Pupfish Protection and Relocation Plan and discusses the process for obtaining a BO from USFWS, a Consistency Determination or 2081 Incidental Take Permit from CDFW, and using approved biologists for handling of desert pupfish. Therefore, the proposed project's potential contribution to impacts on desert pupfish would not be cumulatively considerable.

Marshland habitats provide potential habitat for southwestern willow flycatcher, California black rail, and Yuma Ridgway's rail. Yuma Ridgway rail was detected near the Morton Bay area, and future projects in the Morton Bay area could result in cumulative impacts to these species. Hell's Kitchen is the only nearby project that is also located in the Morton Bay area, which has been approved but not yet built. The Hell's Kitchen December 2023 EIR includes mitigation measures to protect Yuma Ridgway's rail and California rail, including having construction activities avoid the nesting and molting flightless season of Yuma Ridgway's rail, preconstruction surveys and monitoring, reduced vehicle speeds, noise attenuation, and habitat conservation to offset impacts to rail habitats. These measures, which are similar to the measures proposed by staff, would also protect willow flycatcher, if found. With the mitigation measures proposed by Elmore North, Morton Bay,

and Black Rock, in combination with measures provided in the Hell's Kitchen EIR, the combined effect of these cumulative projects would be reduced to less than significant.

Future proposed projects would cumulatively cause losses of agricultural habitat that is considered regionally important to wildlife in Imperial County, including burrowing owls other common or special-status bird species, and foraging bats. Cumulative impacts would also occur to burrowing owls and active burrows within the region. Habitat loss and degradation from rapid urbanization of farmland in the core areas of the Central and Imperial valleys is the greatest of many threats to burrowing owls in California (Shuford and Gardali 2008). However, use of these areas varies depending on the crop rotation and existing management practices including herbicide and/or pesticide use and the timing of the harvest.

Approximately 588,416 acres (20%) of Imperial County consists of irrigated agricultural fields (Census of Agriculture 2017; see TN254015). Approximately 0.10 percent of potential agricultural foraging habitat would be affected if all three proposed geothermal projects were constructed. The permanent loss of agricultural foraging habitat from construction is <0.001 percent. Elmore North, Morton Bay, and Black Rock generating facility construction would result in direct impacts to 30 active burrowing owl burrows and 399.4 acres of permanent impacts to burrowing owl habitat. Though direct impacts to active burrowing owl burrows at the other identified projects in the region are not known, based on data for the geothermal projects, staff can extrapolate that up to 103 additional burrows may be impacted.

Upon completion of construction, temporarily impacted agricultural fields would revert to previous use. Impacts to agricultural land use that provide habitat for wildlife species would result in a small reduction compared to the total agricultural lands available in Imperial County. The applicant provided measures to compensate for impacts to burrowing owls (TN249723, AFC Section 5.2.3.1.11-5.2.3.1.12). Staff proposes modifications to this measure based on guidance provided by CDFW, and to include clarifying language. These modifications have been incorporated into staff's proposed **BIO-16** (Burrowing Owl Habitat Preservation and Enhancement) which would require enhancement of unsuitable burrows or installation of new burrows at a 2:1 ratio for every burrowing owl burrow that is destroyed, and enhancement or replacement of burrowing owl foraging habitat at a 1:1 ratio. Based on these ratios, the applicant must protect and manage land for burrowing owls either through created habitat nearby and/or through payment at a CDFW approved conservation bank. Given that these burrows are within the project boundary of all three geothermal projects, the applicant would submit a Burrowing Owl Mitigation Plan that includes mitigation combined for all three projects to avoid duplicate mitigation requirements.

Bats utilize a variety of daytime roosting sites that occur throughout the general area. Morton Bay, Elmore North, and Black Rock will not remove any tree species, including palm trees, and therefore not result in cumulative impacts to tree roosting sites. Though the greatest cumulative impact would be loss of agriculture foraging habitat, as discussed previously, there is also the potential loss of riparian foraging habitat. Riparian habitat is

regulated by the RWQCB and CDFW and impacts to these habitats from these or other projects would require coordination with these resource agencies and mitigation for loss of riparian habitat and/or wetlands and waters, reducing the combined effect of these projects to less than significant.

Denning mammals, including Yuma hispid cotton rat, American badger, and desert kit fox, have the potential to occur in the area. Yuma hispid cotton rat have expanded their range via irrigation canals. Morton Bay, Elmore North, and Black Rock would not directly impact any IID canals or drains that could support Yuma hispid cotton rat, and therefore are not expected to result in cumulative impacts to this species. American badger and desert kit-fox are far-ranging species with large home ranges. Given the mobility and elusive nature of these species, it is likely that individuals would disperse into nearby habitat. As discussed previously, land use that provide habitat for American badger and desert kit-fox would result in a small reduction compared to the total lands available in Imperial County. The combined effect of these cumulative projects to denning mammals would be reduced to less than significant.

Overhead transmission lines associated with the Morton Bay, Elmore North, and Black Rock projects and many of the other current and reasonably foreseeable projects also pose an electrocution risk for avian species. The Morton Bay, Elmore North, and Black Rock projects would minimize potential avian collision and electrocution with staff's proposed **BIO-20** (Avian Collision Deterrent Proposal and Monitoring Plan), which would require the preparation of an Avian Collision Deterrent Proposal and Monitoring Plan in consultation with a working group of interested agency personnel, incorporation of APLIC 2006 guidelines, and monitoring for a minimum of two years. Projects that include the overhead utility lines as a project component would have to implement similar mitigation to reduce potential impacts to avian species. Therefore, the combined effects of these project would be less than significant.

Determinations regarding the significance of impacts of the related projects on biological resources would be made on a case-by-case basis. If necessary, the applicants of the related projects would be required to implement appropriate mitigation measures. Therefore, implementation of related projects and other anticipated growth in Imperial County would not combine with the proposed project to result in cumulatively considerable impacts on biological resources. With the implementation of these COC/MM, cumulative impacts to the region would be reduced to less than significant.

Nitrogen Emissions and Deposition

Nitrogen deposition (N-dep) is the input of NOx and ammonia (NH3) "atmospherically derived pollutants", primarily nitric acid (HNO3), from the atmosphere to the biosphere. The sources of these pollutants are primarily vehicle and industrial emissions, including power generation. Operation of the three geothermal projects (Elmore North, Morton Bay, and Black Rock) production testing unit (PTU), mobile testing unit (MTU), and cooling tower would result in emissions of oxides of nitrogen (NOx). Most of the emissions would be from the cooling tower, which is consistently running during operations.

Increased N-dep in nitrogen-poor habitat can alter plant communities and allow the proliferation of non-native species, which crowds out native species (Fenn et. al 2003; Weiss 2006). There is also supportive evidence that N-dep may have deleterious effects on threatened and endangered species, particularly in San Francisco Bay area and southern California, though there is a high degree of uncertainty about the precise role of Nitrogen deposition. Examples of threatened and endangered species include butterflies that rely on specific host plants, reduced diversity of food sources for desert tortoise, and special-status plant species that rely on shrub, forb, and grassland communities (Fenn et. al 2003). Threats to sensitive species habitat from noxious weeds and altered plant communities are exacerbated by nitrogen fertilization, and the deposition of additional nitrogen in an already stressed ecosystem would be a potentially significant indirect impact.

The CEC staff considers habitat modification to protected areas and designated critical habitat to be a potentially significant effect if these communities were known to be sensitive to N-dep. However, there is no designated or proposed critical habitat for federally listed species within 6-miles of these project locations. There are no known designated sensitive habitats within 6-miles of these project locations, and there is only one CNDDB rare plant record from 1996 within the six-mile buffer. Areas that encompass these projects areas include existing agricultural, a portion of the Salton Sea, and a small portion of sandy dune habitat near the edge.

Significant regional protected areas in the vicinity of these generating facility locations include the NWR, the Imperial Wildlife Management Area (IWMA) (Wister and Hazard), the IID Managed Marsh Complex, and the Niland Ranch Wildlife Habitat Foundation (national wildlife refuge certified by the National Wildlife Federation). New River, Alamo River, and the Salton Sea are important water bodies, and a portion of these features occur near these generating facility locations. One approach for quantifying nitrogen deposition is through critical load, which is defined as the input of a pollutant below which no detrimental ecological effects occur over the long-term according to present knowledge. Both freshwater and estuarine intertidal wetlands tend to be N-limited ecosystems. Most freshwater wetlands (such as marshes) tend to have relatively closed water and N cycles and are therefore more sensitive to N deposition than estuarine wetlands. Salt marsh habitat tends to have a higher critical load than other ecosystems due to its open nutrient cycles that are less affected by atmospheric deposition than other nitrogen loading sources (Pardo et. al. 2011).

A detailed analysis of nitrogen deposition for Morton Bay is provided in Criterion a, Operations, and is summarized here as it applies to all three geothermal projects. The CEC staff used the AERMOD (USEPA 2023a) to establish N-dep values resulting from these projects; and a combination of CMAQ modeling system (v5.3.2; data 2002-2019; USEPA 2024a) and the EQUATES (v1.0: Emissions; data 2021; USEPA 2024b) to establish baseline conditions. Impacts could potentially occur if the emissions from the project in conjunction with baseline nitrogen deposition levels exceeded the critical load for the community.

The projects estimated contributions to existing nitrogen deposition would be the highest at and around the generating facility sites and could result in high cumulative impacts of nitrogen deposition, particularly to the nearby IWMA Hazard Tract. The iodine bush scrub community could also result in high cumulative impacts of nitrogen deposition. Nitrogen deposition would be above critical load levels in these areas. Critical load levels could be met at IID Managed Marsh Complex as a result of cumulative nitrogen deposition. Critical load thresholds for N-dep in the Salton Sea are not anticipated to be met, though information on nitrogen deposition in the Salton Sea is limited within existing management plans.

Nitrogen deposition would not affect any federally designated critical habitats or designated sensitive habitats within six miles of these projects. Potential impacts to the one 1906 rare plant population at the edge of the six-mile buffer, if extant, would be 0.1-2, which is considered negligible. Staff conducted a literature search for management plans and master plans that address nitrogen deposition at the NWR, IWMAs, IID Management Marshes, New River, and Alamo River. Management plans were either unavailable or did not include information regarding baseline N-dep levels or potential for N-dep impacts. Regionally sensitive habitats and aquatic resource features could meet critical load levels due to emissions from generating facility operations. Many of these habitats consist of existing levels of invasive plant species from surrounding agriculture and urbanization. Invasive species are actively managed by the NWR, which could have some of the highest nitrogen deposition contributions. Communities that may meet critical loads are already subjected to nitrogen deposition from existing generating facility operations, agricultural equipment usage, and urban development, resulting in baseline conditions between 6-7 kg N/ha/yr. Though these freshwater communities where critical load for nitrogen deposition is met could support threatened or endangered species, these communities are not known to support special-status plant species, and wildlife species that utilize these habitats are not heavily reliant on specific plant species. Given there are no designated critical habitats or sensitive habitats in the area, the existing salinity of the Salton Sea, existing level of baseline N-dep and invasive species in the area, lack of wildlife that specifically rely on special-status plants, lack of known special-status plant populations, and limited information regarding N-dep specific to the area, cumulative N-dep impacts are considered less than significant and dismissed from further conclusions.

5.2.3 Project Conformance with Applicable LORS

Table 5.2-6 staff's determination of conformance with applicable local, state and federal LORS, including any proposed COC/MM, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific conditions of certification, the proposed project would be consistent with all applicable LORS. The subsection below, "Staff Proposed Conditions of Certification," contains the full text of the referenced conditions of certification.

TABLE 5.2-6 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis for Determination**
Federal	
Clean Water Act (33 USC 1344) - USACE	
Prohibits the discharge of dredged or fill material into the waters of the U.S. without a permit.	**Yes.** The proposed project would include COC/MM to reduce impacts to any waters of the U.S. to a less than significant level and ensure compliance (Section 5.2.2.2).
Federal ESA (16 USC 1531 et seq.) - USFWS	
Designates and protects federally threatened and endangered plants and animals and their critical habitat. applicants for projects that could result in adverse impacts on any federally listed species are required to consult with and mitigate potential impacts in consultation with USFWS.	**Yes.** The proposed project would include COC/MM to reduce impacts to any federally threatened or endangered plants or animals to a less than significant level and ensure compliance (Section 5.2.2.2).
MBTA (16 USC 703 to 711) – USFWS	
Protects all migratory birds, including nests and eggs.	**Yes.** The proposed project would include COC/MM to reduce impacts to resident and migratory birds to a less than significant level and ensure compliance (Section 5.2.2.2).
Executive Order 12996, Management and General Public Use of the National Wildlife Refuge System – USFWS	
The mission of the National Wildlife Refuge System is to preserve a national network of lands and waters for the conservation and management of fish, wildlife, and plant resources of the U.S. for the benefit of present and future generations	**Yes.** The proposed project would include COC/MM to reduce impacts to any portion of the National Wildlife Refuge System to a less than significant level and ensure compliance (Section 5.2.2.2).
National Wildlife Refuge System Improvement Act of 1997 – USFWS	
The legislation requires that a comprehensive conservation plan (also known as comprehensive management plan) be in place for each national wildlife refuge within 15 years after passage of this bill.	**Yes.** The NWR does not have a comprehensive conservation plan completed at the time of this AFC. The proposed project would include COC/MM to reduce impacts to any portion of the National Wildlife Refuge System to a less than significant level and ensure compliance level (Section 5.2.2.2).
Salton Sea Reclamation Act of 1998 – DOI	
Permit the continual use of the Salton Sea as a reservoir for irrigation drainage and reduce and stabilize the overall salinity of the Salton Sea; stabilize the surface elevation of the Salton Sea; reclaim, in the long term, healthy fish and wildlife resources and their habitats; and enhance the potential for recreational uses and economic developments of the Salton Sea.	**Yes.** The proposed project would include COC/MM to reduce impacts to any waters of the U.S. to a less than significant level and ensure compliance (Section 5.2.2.2).
Lea Act (16 USC 695 to 695c; 62 Stat. 238) – DOI	
Authorizes the Secretary of the Interior to acquire and develop waterfowl and other wildlife management areas in California, provided the state acquires equivalent acreage.	**Yes.** The proposed project would include COC/MM to reduce impacts to any portion of the National Wildlife Refuge System to a less than significant level and ensure compliance (Section 5.2.2.2).

TABLE 5.2-6 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis for Determination**
Desert Renewable Energy Conservation Plan - BLM	
Habitat Conservation Plan/Natural Community Conservation Plan and a Bureau of Land Management Land Use Plan Amendment covering both public and private lands across seven counties, including the Salton Sea area in Imperial County	**Yes.** The proposed project is within the boundaries of the DRECP, but it is not located on Bureau of Land Management lands or Areas of Critical Environmental Concern (Section 5.2.2.2).
State	
CESA (Fish and Game Code Section 2050 et seq.) - CEC	
Species listed under this act cannot be "taken" or harmed, except under specific permit.	**Yes.** The proposed project would include COC/MM to reduce impacts to State-listed species to a less than significant level and ensure compliance (Section 5.2.2.2).
Title 14, CCR, Sections 670.2 and 670.5 – CDFW	
Lists animals designated as threatened or endangered in California.	**Yes.** The proposed project would include COC/MM to reduce impacts to State-listed species to a less than significant level and ensure compliance (Section 5.2.2.2).
California Public Resources Code, Division 15, Chapter 6, Section 25527 – CDFW	
Prohibits placing facilities within ecological preserves, wildlife refuges, estuaries, and unique or irreplaceable wildlife habitats of scientific or educational value.	**Yes.** The proposed project would include COC/MM to reduce impacts to any portion of the National Wildlife Refuge System to a less than significant level and ensure compliance (Section 5.2.2.2).
Fish and Game Code Sections 3511, 4700, 5050, and 5515 – CDFW	
List animal species that are FP in California.	**Yes.** The proposed project would include COC/MM to reduce impacts to FP animal species to a less than significant level and ensure compliance (Section 5.2.2.2).
Fish and Game Code Section 3503 and 3503.5	
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 specifically protects birds of prey.	**Yes.** The proposed project would include COC/MM to reduce impacts to bird nests and eggs, including birds of prey, to a less than significant level and ensure compliance (Section 5.2.2.2).
Fish and Game Code Section 3513	
Makes it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any migratory bird.	**Yes.** The proposed project would include COC/MM to reduce impacts to migratory birds to a less than significant level and ensure compliance (Section 5.2.2.2).
Fish and Game Code Sections 1930 et seq. – CDFW	
Designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitat.	**Yes.** The proposed project would include COC/MM to reduce impacts to any significant wildlife areas and ensure compliance (Section 5.2.2.2).

TABLE 5.2-6 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis for Determination**
Fish and Game Code Sections 2700 et seq. – CDFW	
Provides funding to the Wildlife Conservation Board and CDFW for acquisition, enhancement, restoration, and protection of areas that are most in need of proper conservation.	**Yes.** The proposed project is not located in an area protected by this code (Section 5.2.2.2).
Fish and Game Code Sections 1900 et seq. – CDFW	
The Native Plant Protection Act lists threatened, endangered, and rare plants listed by the State.	**Yes.** No state threatened, endangered, or rare plants are expected to be impacted by the proposed project. The proposed project would include COC/MM to reduce impacts to protected plant species to a less than significant level and ensure compliance (Section 5.2.2.2).
California Fish and Game Code (Sections 1601 through 1607) - CDFW	
Prohibits alteration of any stream, including intermittent and seasonal channels and many artificial channels, without a permit from CDFW.	**Yes.** The proposed project would include COC/MM to reduce impacts to any streams, including intermittent and seasonal channels, to a less than significant level and ensure compliance (Section 5.2.2.2).
Clean Water Act (33 USC 1342) - RWQCB	
Requires the issuance of a clean water certification or waiver for any dredge/fill activities permitted under Section 404.	**Yes.** The proposed project would include COC/MM to reduce impacts to any waters of the U.S. to a less than significant level and ensure compliance (Section 5.2.2.2).
Local	
Imperial County General Plan – Conservation and Open Space Element, Policy 1	
Provide a framework for the preservation and enhancement of natural and created open space, which provides wildlife habitat values. 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 allowed only when alternatives have been considered and determined infeasible.	**Yes.** The proposed project would not impact any areas protected by this plan (Section 5.2.2.2).
Imperial County General Plan – Conservation and Open Space Element, Policy 2	
Landscaping should be required in all developments to prevent erosion on graded sites and, if the area is contiguous with undisturbed wildlife habitat, the plan should include revegetation with native plant species.	**Yes.** The proposed project would include COC/MM to reduce impacts to undisturbed wildlife habitat to a less than significant level and ensure compliance (Section 5.2.2.2).
Imperial County General Plan – Noise Element	
Identifies that many riparian bird species are sensitive to excessive noise and, as such, they are considered a sensitive receptor.	**Yes.** The proposed project would include COC/MM to reduce impacts to resident and migratory birds to a less than significant level and ensure compliance (Section 5.2.2.2).

5.2.4 Conclusions and Recommendations

As discussed above, with implementation of conditions of COC/MM, the project would have a less than significant impact related to biological resources and would conform with applicable LORS. Staff recommends adopting the conditions of certification as detailed in subsection "5.2.5 Proposed Conditions of Certification" below.

5.2.5 Proposed Conditions of Certification

The following proposed COC/MM include measures to both mitigate environmental impacts and ensure conformance with applicable LORS. The conditions below are enforceable as part of the CEC's certificate for the portions of the projects constituting the site and related facility. Additional impacts associated with project components outside of CECs jurisdiction, such as the well complex licensed by CalGEM, the temporary structures such as the laydown yard to be permitted by Imperial County, and the switching station to be permitted by IID, require mitigation to be less than significant.

The CEQA analysis above evaluates all impacts resulting from all aspects of the project, and for the entire project to have less than significant impacts, the mitigation actions described in these COC/MM would need to be implemented by the various licensing jurisdictions as mitigation measures (MMs). For purposes of the facility certification issued by CEC, the following COC/MM must be complied with by the applicant on the jurisdictional site and related facilities as delineated in the Project Description, Section 3.1. Verifications set forth below only apply to the COCs, not the MMs. Table 5.2-7 summarizes measures recommended for project components that fall under CEC's license and those recommend for project components requiring permits/authorizations by local or other jurisdictions.

TABLE 5.2-7 RECOMMENDED MEASURES FOR CEC AND OTHER PROJECT COMPONENTS

COC/MM	CEC's Jurisdiction	Local/Other Jurisdiction
BIO-1 (Protocol Botanical Surveys)	X	X
BIO-2 (Pesticide Application Requirements)	X	X
BIO-3 (Bumble Bee Avoidance Measures)	X	X
BIO-4 (General Conservation Measures)	X	X
BIO-5 (Worker Environmental Awareness Program)	X	X
BIO-6 (Designated Biologist(s) and Biological Monitor(s))	X	X
BIO-7 (Conduct Pre-Activity Surveys for Special-Status Wildlife)	X	X
BIO-8 (Biological Construction Monitoring)	X	X
BIO-9 (Desert Pupfish Protection and Relocation Plan)	--	X
BIO-10 (Invasive Species Management Plan)	X	X
BIO-11 (Closure, Revegetation, and Rehabilitation Plan)	X	X
BIO-12 (Conduct Pre-Activity Surveys for Nesting Birds)	X	X
BIO-13 (Yuma Ridgway's Rail Survey, Management, and Monitoring)	X	X
BIO-14 (Yuma Ridgway Rail Species Noise Assessment and Abatement Plan)	X	X

TABLE 5.2-7 RECOMMENDED MEASURES FOR CEC AND OTHER PROJECT COMPONENTS		
COC/MM	**CEC's Jurisdiction**	**Local/Other Jurisdiction**
BIO-15 (Burrowing Owl Surveys, Monitoring, Prevention, and Relocation)	X	X
BIO-16 (Burrowing Owl Habitat Preservation and Enhancement)	X	X
BIO-17 (Habitat Compensation or Restoration Plan)	X	X
BIO-18 (American Badger, Desert Kit Fox, and Yuma Hispid Cotton Rat Avoidance and Minimization Measures)	X	X
BIO-19 (Facility Pond Wildlife Escape and Monitoring Plan)	X	--
BIO-20 (Avian Collision Deterrent Proposal and Monitoring Plan)	X	--
BIO-21 (Biological Resources Mitigation Implementation and Monitoring Plan)	X	X
BIO-22 (Provide Evidence of Applicable Jurisdictional Waters Permits)	X	X

COC BIO-1/ MM BIO-1 Protocol Botanical Surveys The project owner shall conduct focused surveys for special-status plant species prior to ground-disturbing activities that occur in the Spring of 2025 or later. Prior to any vegetation removal or ground-disturbing activities in native or semi-natural habitat (Tamarisk thickets, cattail marsh, iodine bush scrub), a qualified botanist(s) approved by the CEC Compliance Project Manager (CPM) shall conduct surveys for special-status plants within the limits of the work zone plus a 100-foot buffer unless otherwise prohibited due to legal access or safety concerns. Surveys may be adjusted to reflect proposed work schedules and locations and need not be performed all at one time. The surveys shall be conducted during the appropriate blooming period(s) according to protocols established by CDFW and CNPS (CDFW, 2018) or more recent protocols, if available. Surveys shall include the following species: Salton milk-vetch (*Astragalus crotalariae*; blooms January through April), Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*; blooms May through June), Cooper's rush (*Juncus cooperi*; blooms April through May), and dwarf germander (*Teucrium cubense* ssp. *depressum*; blooms March to May).

All special-status plant species, including any listed threatened or endangered, and those ranked CRPR 1A, 1B, 2, 3, and 4 that are subject to project disturbance shall be documented during surveys using a precision GPS unit. Surveys shall be valid for a period of three years if conducted during a period of average rainfall; however, the project shall not be delayed during a drought year and would rely on baseline or previously collected data. If vegetation removal does not occur in a previously surveyed area within three years, the surveys shall be repeated provided there is adequate rainfall to support germination.

A botanical survey report and map detailing the results of the surveys shall be submitted to the CPM prior to ground disturbance. The report shall include names of surveyors, dates surveys were performed, survey location(s), maps, and a compendium of all plant species identified, and any avoidance buffers established. The map shall clearly depict the survey area and the location of any special-status

plant species occurrences, if found, and a description of each occurrence (population size, associated species, any distinctive characteristics, reproduction, etc.). Survey reports shall be submitted to the CPM and shall be made available to resource agencies and federal land managers upon request.

If ground disturbing or O&M activities are proposed at locations where any special-status plant species are present, or known to occur, the following conditions shall be implemented:

- A qualified botanist(s) approved by the CPM shall establish a 50-foot avoidance buffer around the plant or plant population prior to activities. All ground-disturbance shall be prohibited within the avoidance buffer unless otherwise directed by the CPM in coordination with CDFW. Only manual clearing of vegetation shall be permitted and no mechanical treatment, including mowers, tractors, chippers, or dozers shall be allowed within 50 feet of the edge of the avoidance buffer. All vehicles shall have rubber tires and shall only be permitted access on well-established roads. Off-road travel shall be avoided to the extent possible.
- If project activities result in the loss of more than 10 percent of the known individuals within the special-status plant species occurrence to be impacted, the project owner shall acquire compensatory mitigation land at a 2:1 mitigation ratio to compensate for impacts to special-status plant species. Habitat acquisition for these species may also be integrated with habitat compensation for other species if the criteria listed below are met:
    - Contain occupied habitat for any occurrence anywhere in the species range in California;
    - Contain unoccupied habitat that is in the immediate watershed of an extant occurrence in California and considered to have a high potential for occurrence; or
    - Provide watershed protection to extend protected occurrences regardless of the habitat the acquired lands support.
- The compensatory mitigation would not be required if the botanical surveys rule out potential presence of these species (i.e., surveys were conducted at the appropriate time of year and under appropriate environmental conditions).

The project owner shall provide financial assurances to the CPM to guarantee that an adequate level of funding is available to implement the measures described in this condition if special-status plant species are discovered. These funds shall be used solely for implementation of the measures associated with the project. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") prior to initiating ground-disturbing project activities.

Verification: A botanical survey report and map detailing the results of the botanical surveys shall be submitted to the CPM no later than 14 days after completion of the survey. If no special-status plant species were identified, no further action is necessary.

If special status plant species were identified, a qualified botanist shall delineate the boundaries of these special-status plant occurrences that shall be preserved within 14 days prior to the initiation of ground disturbing activities. The plant occurrence boundaries shall be monitored during activities described under **BIO-8** (Biological Construction Monitoring).

If project activities shall result in the loss of more than 10 percent of the known individuals within the special-status plant species occurrence to be impacted, the project owner shall provide written verification of "Security" in accordance with this condition of certification for compensatory mitigation to the CPM. Written verification shall be provided no later than 30 days prior to beginning project ground-disturbing activities within the boundaries of the special-status plant occurrences. The project owner, or an approved third party, shall complete and provide written verification of the proposed compensation lands acquisition within 18 months of the start of project ground-disturbing activities.

No less than 90 days prior to acquisition of the property, the project owner shall submit a formal acquisition proposal to the CPM and CDFW describing the parcels intended for purchase. The project owner, or an approved third party, shall provide the CPM and CDFW with a management plan for the compensation lands and associated funds within 180 days of the land or easement purchase, as determined by the date on the title. The CPM shall review and approve the management plan, in consultation with CDFW.

On January 31st of each year following construction for a period of five years, the Designated Biologist (DB) shall provide a report to the CPM and CDFW that describes the results of monitoring and management of the habitat compensation lands for special-status plant species.

COC BIO-2/ MM BIO-2 Pesticide Application Requirements The project owner shall ensure than any person using pesticides use on the project site, including herbicides, insecticides, or rodenticides, implements the following best management practices (BMPs).

- All pesticide applicators shall have received training and shall be licensed in appropriate categories.
- Herbicide-free buffer zones shall be maintained per label instructions.
- All herbicide label and material safety data sheet instructions shall be followed regarding mixing and application standards and equipment-cleaning standards to reduce potential exposure to the public through drift and misapplication.

- The project owner shall ensure that areas treated with herbicides shall be posted and reentry intervals specified and enforced in accordance with label instructions. Herbicides and equipment shall never by left unattended in areas with unrestricted access.
- Climate, geology, and soil types shall be considered (including rainfall, wind, depth of aquifer, and soil permeability) in selecting the herbicide with the lowest relative risk of migrating to water resources.
- There shall be no aerial application of herbicides.
- All herbicide spill requirements shall be followed in the rare case of an herbicide spill, including containment, cleanup, and notification procedures.
- All herbicide application by basal spray and foliage spray methods shall be prohibited within 100 feet of any seep, spring, pond, lake, river, stream, marsh, canal, drain or open water. Herbicide application to targeted vegetation by direct application methods (e.g., injection or cut-stump treatment) using herbicide approved for aquatic use by the USEPA shall be prohibited within 50 feet during the wet season (generally October 1 to May 31) and allowed up to the edge of the seasonal wetlands or riparian habitat in the dry season (generally June 1 to September 30).
- If herbicide use is proposed within 250 feet of a seasonal wetland, a qualified biologist(s) approved by the CPM must be present to ensure the protection of the work area limits. Alternatively, the seasonal wetlands shall be clearly delineated with staking, flagging, or other conspicuous method for avoidance.
- Rodent control shall be addressed through exclusion and sanitation whenever possible. These include sealing off rodent entrances, removing debris that may attract and house rodents, and ensuring that food and trash are stored with tight-fitting lids or are removed from the site. If trapping is required, snap traps shall be used in lieu of poison bait whenever possible.
- Rodent baits with the active ingredients brodifacoum, bromadiolone, difethialone and difenacoum shall not be used without the CPM approval to control rodent populations. These ingredients are very toxic and persistent and have been found widely in non-target wildlife.

Verification: No less than 30 days prior to the initial pesticide treatment, project owner shall provide to the CPM a Pesticide Application Plan for review and approval. The plan shall describe pesticides intended for use, target applications, and BMPs to prevent unintended mortality to sensitive species. If the project owner intends to use the active ingredients brodifacoum, bromadiolone, difethialone and/or difenacoum for rodent control, the project owner shall provide an explanation on the reason for usage over less toxic options, and BMPs to avoid exposure to non-target wildlife. The Pesticide Application Plan shall be updated no later than every 5 years to incorporate new pesticide information and BMPs. Any changes to the Plan shall require the CPM approval prior to implementation.

COC BIO-3/ MM BIO-3 Bumble Bee Avoidance Measures The project owner shall conduct surveys for Crotch's bumble bee if project activities are scheduled to begin or are ongoing during the colony active period (April 1 through August 31). The surveys shall be conducted by a qualified entomologist(s) or biologist(s) familiar with the life history and ecology of Crotch's bumble bee.

Surveys shall cover all project work areas, including staging and parking areas, plus a 50-foot buffer. Surveys shall follow non-invasive protocols established by CDFW in "*Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species*" or more recent CDFW-approved methods if they become available prior to project implementation (CDFW 2023d).

Survey methods should include a minimum of three on-site surveys spaced two to four weeks apart and should be developed to detect foraging bumble bees and potential nesting sites. If handling is required for identification, it shall only be conducted by a person possessing a 2081(a) Memorandum of Understanding (MOU) from CDFW. Otherwise, bumble bees observed during the surveys shall be photographed in the open for identification.

If any Crotch's bumble bees are detected during surveys, the qualified biologist shall notify CDFW and the CPM within 24 hours. If Crotch's bumble bee(s) is observed foraging within the project site, work activities at the location shall pause until the bee moves outside the project site. If an active Crotch's bumble bee nest is identified during the surveys, a 50-foot avoidance buffer shall be clearly delineated with staking, flagging, and/or signage and project activities shall be prohibited from the area until it is determined that the nest is no longer active. Impacts to the nest shall not occur unless authorized by a 2081(b) Incidental Take Permit issued by CDFW.

Survey results shall be submitted to the CPM and CDFW prior to the initiation of ground-disturbing activities and shall include the following:

- Names of surveyors and, if applicable, names of biologist(s) determining identification.
- Location (latitude and longitude) and extent of surveyed areas with maps.
- Description of conditions during each survey: date, time, temperature, wind speed.
- Detailed habitat assessment including percent cover of floral resources and potential nesting and overwintering habitat.
- Number of surveyors per acre, number of acres surveyed, amount of time of focused surveys.
- List of species observed.
- Foraging habitat surveys: name (at least to genus) of host plants observed and whether bees were observed on them.

- Nesting habitat surveys: type of nest/structure surveyed and if bees were found in them, number of nests found in project site, photo log of suitable habitat and plants.
- Photo vouchers of bumble bees for identification.
- Confirmation that photo vouchers were submitted and candidate bumble bees were identified, if applicable.
- If any bumble bees or active nests are detected during the survey, the report shall include a map or aerial photo identifying the location of the bee/nest and shall depict the boundaries of the no-disturbance buffer zone around the nest(s) that would be avoided during project construction.

Survey data shall also be submitted to the CNDDB and shall include specifying the type of observation (individual bee/nest), type of vegetation cover, slope, aspect, GPS location, distance to foraging location (if known), and other relevant conditions noted. Negative survey results shall also be reported. Positive observations of Crotch's bumble bee shall not be documented on publicly available databases.

Verification: The names and credentials of the qualified entomologist(s) conducting the surveys for Crotch's bumble bee shall be submitted to CDFW for review and comment and to the CPM for review and approval no less than 14 days prior to the surveys.

The DB shall submit information describing the findings of the bumble bee surveys and implementation of any avoidance measures in the Monthly Compliance Report (MCR) (BRMIMP; **BIO-21**) to CDFW and the CPM.

Survey data shall also be submitted to the CNDDB and shall include specifying the type of observation (individual bee/nest), type of vegetation cover, slope, aspect, GPS location, distance to foraging location (if known), and other relevant conditions noted. Negative survey results shall also be reported. Positive observations of Crotch's bumble bee shall not be documented on publicly available databases.

COC BIO-4/ MM BIO-4 General Conservation Measures The project owner shall implement the following general conservation measures duration construction, operation and decommissioning activities.

- Delineate Work Area. Prior to any ground-disturbing activities project work limits, including staging and parking areas shall be clearly delineated by silt fencing, staking, flagging, or other clearly identifiable materials. The defined work areas and access routes shall avoid any impacts to special-status species, and to the greatest extent feasible, native vegetation communities, jurisdictional areas, and any other sensitive resource features; and any necessary avoidance areas, including an appropriate buffer(s). All persons

employed or otherwise working on the project site shall be instructed about the restriction on accessing habitat outside the delineated work area. Delineated materials shall be monitored daily, and maintained, repaired, or replaced immediately if the materials are damaged, lost, stolen or become ineffective in any way. The DB(s) shall ensure the delineation materials do not create a barrier to wildlife movement and shall not pose a risk to wildlife safety. The qualified biological monitor shall routinely inspect the fence on each day when monitoring occurs to ensure it remains in functioning condition and that no wildlife are walking along the silt fence line. All temporary flagging, fencing, and/or barriers shall be removed from the project site upon completion of project activities.

- Lighting and Night Work. Avoid night work whenever feasible. If project activities are to be conducted at night, night lighting shall be of the lowest illumination necessary for human safety, minimized by using shielded directional lighting pointed downward, thereby avoiding illumination of adjacent natural areas and the night sky. Permanent light fixtures on infrastructure shall only be installed where necessary for safety of personnel. Facility lighting shall be designed, installed, and maintained to prevent side casting of light toward wildlife habitat and sensitive resource features. Lighting shall be kept to the minimum level for safety and security needs by using motion or infrared light sensors and switches to keep lights off when not required and shielding operational lights downward to minimize skyward illumination. No high intensity, steady burning, bright lights such as sodium vapor or spotlights shall be used.
- Trash and Debris. The project site shall be kept as clear of debris as possible. All food-related trash items shall be enclosed in sealed, animal-proof containers to avoid attracting opportunistic predators such as coyotes, ravens, and feral dogs, and regularly removed from the site. All spoils and material disposal shall be disposed of properly. Upon completion project activities within each project location, all construction refuse shall be removed and properly dispose of, including, but not limited to, broken equipment parts, wrapping material, cords, cables, wire, rope, strapping, twine, buckets, metal or plastic containers, and boxes.
- SWPPP and Erosion Control. Prepare and implement a construction stormwater pollution prevention plan identifying Best Management Practices to avoid stormwater and erosion control impacts in accordance with **WATER-1/ MM WATER-1** (NPDES Construction Permit Requirements). Appropriate Best Management Practices (BMPs) for erosion and sediment control shall be utilized to prevent sediment and construction debris from entering nearby streams, rivers, and watersheds. Erosion control materials shall be certified weed-free and not contain plastic netting. Plastic netting could entangle wildlife, resulting in injury or death. Fiber rolls or erosion control mesh shall be made of loose-weave mesh that is not fused at the intersections of the weave, such as jute, or coconut (coir) fiber, or other products without welded weaves. Non-welded

weaves reduce entanglement risks to wildlife by allowing animals to push through the weave, which expands when spread. BMPs shall not pose a barrier to wildlife movement and shall be installed to allow for the safe passage of wildlife movement out of the project area.

- Avoid IID Canals and Drains, Salton Sea, and Alamo River. Construction and operation of the project shall avoid the Salton Sea, the Alamo River, and canals and drains, including all associated riparian habitat, and any canals and drains that have been abandoned but could still convey water to the Salton Sea. No pipelines or other facilities shall be constructed over the Alamo River or the Salton Sea, with the exception of gen-tie wires that span between towers. Gen-tie towers shall be well away from IID canals, or the Alamo River, and conductors shall be positioned to avoid aquatic resource impacts. All access to construction, laydown/parking, borrow pit, and construction camp sites shall be through existing crossings over supply and irrigation canals. Pipelines and gen-tie lines that cross canals and drains shall be placed as far back from the edge to the extent feasible. When constructing pipelines over irrigation/drain canals, construction equipment and work areas shall be staged on existing staging or access roads away from aquatic resources. The pipelines shall be placed on support structures on either side of the canals with a crane to protect the canals. Auger cast piles shall be used instead of impact or vibratory pile driving to eliminate the potential for hydroacoustic impacts to aquatic species. Concrete wash outs shall be placed on the generating facility site, away from any aquatic features.
- Parking and Staging. Vehicles and equipment shall be parked on pavement, existing roads, and previously disturbed or developed areas, or work areas. Staging and temporary construction areas shall be outside of suitable habitat for listed species and shall use existing roads and developed areas to the extent possible. Project impacts shall be avoided or minimized in vegetation communities likely to be occupied by listed species, as determined by the biological monitor. All riparian vegetation (e.g., cattails and marshland habitats) shall be avoided.
- Refueling Areas. All equipment maintenance, staging, and dispensing of fuel, oil, coolant, or any other such activities shall be restricted to staging areas. No vehicles or equipment shall be refueled within 100 feet of an aquatic feature unless a bermed and lined refueling area is constructed. A Spill Prevention, Control, and Countermeasure plan shall be prepared for hazardous spill containment. In addition, the below measures shall be implemented as applicable to avoid impacts to natural communities:
    - Drip pans and/or absorbent pads shall be used during fueling operations.
    - Equipment shall be inspected for leaks and spills daily, and repairs shall be made if necessary.

  - Nozzles used in vehicle and equipment fueling shall be equipped with an automatic shut-off to control drips. Fueling operations shall not be left unattended.
  - Adequate spill kits shall be onsite; equipment fueling vehicles shall be equipped with absorbent pads and spill kit material.
  - All oilers and fuel truck operators shall be trained to respond to a spill.
  - If a noticeable spill occurs, the spill shall immediately be contained, contaminated soil shall be placed in barrels and removed from the site, and the spill shall be documented and reported to the CPM.

- Vehicle and Equipment Cleaning. The spread of nonnative weeds during construction and decommissioning activities and revegetation efforts shall be controlled. All vehicles shall be cleaned and free of mud and debris prior to arriving onsite. Vehicles that contain mud or plant debris shall be prohibited from entering work areas and shall be sent offsite for cleaning. A log detailing records of vehicle and equipment washing shall be kept and maintained onsite by the construction site manager or foreman.
- Control of Invasive Species. Project activities shall be conducted in a manner that prevents the introduction, transfer, and spread of invasive species, including plants (e.g., weeds), animals (including invertebrates such as mussels and snails), and microbes (e.g., algae, fungi, parasites, bacteria, etc.), from one project site and/or waterbody to another.
  - All erosion and other sedimentation controls used during and after construction shall be certified weed free, as applicable. Weed free hay, straw bales, or mulch may be available through the California Interagency Noxious Weed Free Forage and Mulch Program - Weed Free Forage and Straw Resources – California Invasive Plant Council: cal-ipc.org.
  - Prevention Best Management Practices and guidelines for invasive plants can be found on the California Invasive Plant Council's website at: https://www.cal-ipc.org/solutions/prevention/.
  - Prevention Best Management Practices and guidelines for quagga and zebra mussel information can be found on the CDFW invasive species website at: https://wildlife.ca.gov/Conservation/Invasives/Quagga-Mussels; including Aquatic Invasive Species Decontamination Protocol.
  - Prevention Best Management Practices and guidelines for New Zealand mudsnail can be found on CDFW's invasive species website at: https://wildlife.ca.gov/Conservation/Invasives/Species/NZmudsnail.
- Dust Control. Prepare and implement a fugitive dust control plan consistent with ICAPCD requirements and the CPM's construction air quality construction mitigation measures in accordance with AQ-SC3 (Construction Fugitive Dust Control) and AQ-SC4 (Dust Plume Response Requirement). Any soil bonding

and weighting agents used for dust suppression on unpaved surfaces shall be non-toxic to plants and wildlife.

- Hazardous Materials. Raw cement/concrete or washings thereof, asphalt, paint, or other coating material, oil or other petroleum products, or any other substances which could be hazardous to fish and wildlife resources resulting from project related activities shall be prevented from contaminating the soil and/or entering aquatic features. No broken concrete, cement, debris, soil, silt, sand, bark, slash, sawdust, rubbish, or washings thereof, oil or petroleum products, or other organic or earthen material from any construction or associated activity of whatever nature shall be allowed to enter into or be placed where it may be washed by rainfall or runoff into aquatic features. These materials, placed within or where they may enter any aquatic feature, shall be removed immediately. Any hazardous or toxic materials that could be deleterious to aquatic life that could be washed into the stream or its tributaries shall be contained in watertight containers or removed from the project site. When operations are completed, any excess materials or debris shall be removed from the work area.
- Prohibition of Pets, Firearms, and Wildlife Feeding. Personnel should not bring dogs to the work site and should not feed wildlife on or adjacent to the work site. No firearms shall be permitted at the project site except for licensed security guards.
- Vehicle Speeds. A maximum speed limit of 15 miles per hour shall be enforced on any unpaved roads or work areas within the project site. Signage indicating the 15 miles per hour speed limit shall be installed at all ingress points and at locations within the project site.
- Wildlife Entrapment. All potable and non-potable water sources, such as water buffaloes and water truck tanks, shall be covered or otherwise secured to prevent animals (including birds) from entering. Project-related excavations shall be secured to prevent wildlife entry and entrapment. Holes and trenches shall be backfilled, securely covered, or fenced. Excavations that cannot be fully secured shall incorporate appropriate wildlife escape ramps at a slope of no more than a 3:1 ratio, or other means to allow trapped animals to escape. All pipes or other construction materials or supplies shall be covered or capped in storage or laydown areas. No pipes or tubing shall be left open either temporarily or permanently, except during use or installation. Any pipes, culverts, or other hollow materials shall be inspected for wildlife before it is moved, buried, or capped. All animals discovered in trenches shall be allowed to escape voluntarily (by escape ramps or temporary structures), without harassment, before construction or decommissioning activities resume, or be removed from the trench or hole by a qualified biologist and allowed to escape unimpeded. If an animal is entrapped, a qualified biological monitor shall be notified immediately to remove the animal, work with construction crews to

free it in compliance with safety requirements, or work with animal control, USFWS, or CDFW, and the CPM to resolve the situation.

- Injured Wildlife. Any injured wildlife observed on the project site shall be immediately reported to the qualified biologist. The qualified biologist shall be trained in the safe and proper handling and transport of injured wildlife. The qualified biologist shall be available to capture and transport injured wildlife to a local wildlife rehabilitation center or veterinarian as needed. Any injured special-status wildlife species found within or near the project site shall be reported to CDFW and/or USFWS within one workday. All incidences of wildlife injury or mortality resulting from project related- vehicle traffic on roads used to access the project shall be reported in the Monitoring Report.
- Dead Wildlife. Dead animals of non-special-status species found within the project site shall be reported to the appropriate local animal control agency within 24 hours. A qualified biological monitor shall safely move the carcass out of the road or work area as needed. Dead animals of special-status species found in the project site shall be reported to CDFW and/or USFWS, and the CPM within one workday and the carcass shall be handled as directed by the regulatory authority. If any contractor or employee inadvertently kills or injures wildlife, or finds one either dead, injured, or entrapped, the contractor shall immediately report the incident to the qualified biologist identified in the Worker Environmental Awareness Program (WEAP) in **BIO-5** (Worker Environmental Education Program). The qualified biologist shall contact the USFWS (for federally listed species and migratory birds), CDFW (for all wildlife) and/or the local animal control agency, and the CPM, as appropriate. The qualified biologist or biological monitor shall safely move the carcass out of the road or work area if needed and dispose of the animal as directed by the agency.
- Monitoring Report. The biological monitor shall submit a final report to the lead agency's project biologist within 120 days of the completion of project construction, or on December 31st each year if the project continues for multiple years, that includes photographs of habitat areas that were to be avoided and other relevant summary information documenting that authorized impacts were not exceeded and that general compliance with conservation measures was achieved. The lead agency's project biologist shall review the report and forward it to CDFW and USFWS.
- Notification to CNDDB. If any special status species are observed in project surveys, the DB(s) or Biological Monitor(s) shall submit a California Natural Diversity Data Base (CNDDB) forms to the CNDDB within five (5) working days of the sightings.
- Implement APLIC Guidelines. Transmission lines and all electrical components shall be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee's (APLIC's) Suggested Practices for Avian Protection on Power Lines (APLIC 2006) and Mitigating Bird Collisions with

Power Lines (APLIC 1994) to reduce the likelihood of large bird electrocutions and collisions.

- Minimize Noise Impacts. A continuous low-pressure technique shall be used for steam blows, to the extent possible, to reduce noise levels in sensitive habitat proximate to the project. Loud construction, operation, or decommissioning activities (i.e., steam blowing, both low and high pressure, and pile driving) shall be avoided during sensitive breeding periods as outlined in **BIO-13** (Yuma Ridgway's Rail Survey, Management, and Monitoring), and **BIO-14** (Yuma Ridgway Rail Species Noise Assessment and Abatement Plan).

Verification: All mitigation measures and their implementation methods shall be included in the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP; **BIO-21**) and implemented. Implementation of the measures shall be reported in the MCRs by the DB. Any updates to the final BRIMP shall require the CPM approval prior to implementation.

Within 30 days after completion of project construction, the project owner shall provide to the CPM for review and approval, a written construction termination report identifying how measures have been completed.

After construction is completed, for the duration of operations, the project owner shall provide to the CPM for review and approval, and annual report documenting operation and maintenance activities and identifying how measures have been completed.

Within 90 days prior to the onset of decommissioning activities, the project owner shall provide an updated BRIMP to include all mitigation measures and their implementation methods for decommissioning activities. Any updates to the final BRIMP shall require the CPM approval prior to implementation. Within 30 days after completion of project decommissioning, the project owner shall provide to the CPM for review and approval, a written decommissioning termination report identifying how measures have been completed.

COC BIO-5/ MM BIO-5 Worker Environmental Awareness Program The project owner shall develop and implement a Worker Environmental Awareness Program (WEAP) for all persons employed or otherwise working on the project prior to performing any work onsite. The WEAP shall inform all persons about sensitive biological resources associated with the project and assure that personnel working on the site are aware of the obligation to protect and preserve biological resources. Persons include contractors, subcontractors, inspectors, and monitors who work on the project site or any related facilities during site mobilization, ground disturbance, grading, construction, and operation. The project owner shall ensure that all persons overseeing and performing maintenance activities are familiar with the measures required for the project and the consequences of non-compliance. The project owner shall provide interpretation for non-English speaking workers,

and the same instruction shall be provided for any new workers before their performing project construction or maintenance activities. The program shall be repeated annually for projects extending more than one year.

The WEAP must:

- Be developed by or in consultation with the DB and consist of an onsite or training center presentation in which supporting written material is made available to all participants. The specific program can be administered by video or by a competent individual acceptable to the DB.
- Describe key personnel (i.e., DB, Biological Monitor) roles and responsibilities.
- Discuss the locations and types of sensitive biological resources on the project site and adjacent areas. Personnel shall be advised that handling of any wildlife is prohibited.
- Provide a description of special-status species and their habitat needs.
- Explain the status of these species and their protection under the Federal Endangered Species Act, California Endangered Species Act, Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act, Fish and Game Code, and other statutes.
- Explain the status of sensitive biological resources, including aquatic resources and sensitive habitats, and their protection under the Clean Water Act, Porter-Cologne Water Quality Control Act, Fish and Game Code, and other statutes.
- Present the reasons for protecting these resources and explain the measures developed to prevent impacts to special-status species and sensitive biological resources.
- Outline environmentally responsible construction practices.
- Maps showing the location of special-status wildlife, fish, or populations of rare plants, exclusion areas, or other construction limitations.
- Provide a physical description of invasive species and information regarding their habitat preferences, local and statewide distribution, modes of dispersal, and impacts.
- An Invasive Species Education Program that includes a discussion of the invasive species currently present within the project site as well as those that may pose a threat to or have the potential to invade the project site.
- BMPs to be implemented at the project site to avoid the introduction and spread of invasive species into and out of the project site.
- A contact person in the event of the discovery of dead or injured wildlife.
- Identify whom to contact if there are further comments and questions about the material discussed in the program.

- Describe protocol to resolve conflicts that may arise at any time during the construction process.
- Include a training acknowledgment form to be signed by each worker indicating that they received training and shall abide by the guidelines.

Verification: Within 30 days prior to the onset of construction, the project owner shall provide to the CPM a copy of the final WEAP and all supporting written materials and electronic media prepared or reviewed by the DB and a resume of the person(s) administering the program.

Upon completion of the orientation, employees shall sign a form stating that they attended the program and understand all protection measures. These forms shall be maintained by the project owner for at least six months and shall be made available to the CPM and upon request. Workers shall receive and be required to visibly display a hardhat sticker or certificate that they have completed the training.

The project owner shall provide in the MCR (BRMIMP; **BIO-21**) the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date.

Throughout the life of the project, the WEAP shall be repeated annually for permanent employees, and shall be routinely administered within one week of arrival to any new construction personnel, foremen, contractors, subcontractors, and other personnel potentially working within the project area.

COC BIO-6/ MM BIO-6 Designated Biologist(s) and Biological Monitor(s) The project owner shall retain a DB(s) to be onsite throughout the entirety of the project. The project owner shall ensure that the DB(s) is/are knowledgeable and experienced in the identification, biology, natural history, collecting, and handling of appropriate species. The DB(s) shall conduct pre-activity surveys, approve the Worker Environmental Awareness Program (WEAP), monitor all construction and decommissioning activities in and around sensitive biological resources, monitor any active bird nests, perform necessary pre-construction surveys, and implement protection measures as outlined in **BIO-1** through **BIO-22**.

- DB Qualifications. A DB is an individual who holds a bachelor's degree from an accredited university and 1) is knowledgeable in relevant species' life histories and ecology, 2) can correctly identify relevant species, 3) has conducted field surveys for relevant species, 4) is familiar with relevant survey protocols, and 5) is knowledgeable of state and federal laws regarding the protection of sensitive species.
- DB Responsibilities. The DB shall serve as the primary point of contact for the CPM and regulatory agencies regarding biological resources mitigation and compliance. The responsibilities of the qualified biologist shall include, but are not limited to, the following:

- Advise the project owner's Construction and Operation Managers on the implementation of the biological resource conditions of certification.
- Prepare, conduct, and/or oversee WEAP Training and shall ensure that all avoidance and minimization measures are implemented and maintained.
- Supervise the Biological Monitor(s).
- Ensure that proper biological monitoring coverage is maintained during all required project activities.
- Monitor compliance with any project-related applicable jurisdictional water permit(s).
- Conduct or overseeing weekly site inspections upon completion of initial vegetation removal and ground-disturbing activities, and communicating any remedial actions needed (i.e., trash, fencing repairs, etc.) to maintain compliance with biological resource mitigation measures, including applicable project-related jurisdictional water permit(s).
- Inform the project owner's Construction and Operation Managers on the implementation of the biological resource condition of certification.
- Notify the project owner and the CPM of any non-compliance with any biological resources condition of certification.
- Prepare or oversee the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan and MCRs (BRMIMP; **BIO-21**).

- Biological Monitor(s). A Biological Monitor is an individual experienced with construction level biological monitoring and who can recognize species in the project area and who is familiar with the habits and behavior of those species. Biological Monitors shall have academic and professional experience in biological sciences and related resource management activities as it pertains to this project. All Biological Monitors for the project shall be approved by the CPM, in consultation with CDFW, prior to commencement of covered activities.
- Biological Monitor(s) Responsibilities. A biological monitor shall monitor all construction-related activities with the potential to impact listed species to ensure that all conditions of certification are being implemented. The biological monitor shall be familiar with the habitats, plants, and wildlife of the project area, and shall be present while equipment is being used to ensure that issues relating to biological resources are appropriately and lawfully managed. The biological monitor shall be provided with a copy of all protection measures as they relate to the project. The contracts of the project biologist(s) shall allow direct communication with the USFWS and CDFW at any time regarding the project. The responsibilities of the biological monitor shall include, but are not limited to, the following:

- During monitoring duties, perform clearance surveys (sweeps) for sensitive biological resources that may be within or adjacent to work areas prior to crews initiating work activities.
- Conduct compliance monitoring during project activities consistent with the timeline identified above.
- Ensure that work activities are contained within approved disturbance area limits at all times.
- Clearly delineating sensitive biological resources with staking, flagging, or signage, or other appropriate materials that are readily visible and durable. The biological monitors shall inform work crews of these areas and the requirements for avoidance and shall inspect these areas at appropriate intervals for compliance with mitigation measures and permit conditions.
- Routinely inspect wildlife exclusionary fencing to ensure that it remains intact and functional. Any needs for fencing repairs shall be immediately communicated to the responsible party and repairs shall be completed in a timely manner, generally within one workday.
- Routinely inspect work areas where animals may have become trapped or entangled, including equipment covered with bird deterrent netting (if any) and release any trapped or entangled animals. Inspections should also include high traffic areas, such as access roads and staging areas, to locate animals that are potentially in harm's way and relocate them, if necessary.
- Maintain the authority and responsibility to halt any project activities that are not in compliance with applicable mitigation measures or permit conditions or shall have an unauthorized adverse effect on biological resources.
- At the end of each monitoring day, the biological monitor shall verify that all excavations, open tanks, trenches, pits, or similar wildlife entrapment hazards have been adequately covered or have sufficient escape ramps installed to prevent wildlife entrapment and communicate with work crews to ensure covers or ramps are installed and functioning properly.
- Documenting monitoring activities on each day when monitoring occurs, as performed to include location and description of activities monitored.
- The Biological Monitor shall inform the project owner's Construction and Operation Managers on the implementation of the biological resource protection measures and any noncompliance.

Authority of DB(s) and Biological Monitors(s). To ensure compliance with the mitigation measures, the DB(s) and Biological Monitor(s) shall have the authority to immediately halt any activity that does not comply with the mitigation measures, order any reasonable measure to avoid the violation of any mitigation measure, and directly contact the CPM, CDFW or USFWS for any reason. If the DB(s) or

Biological Monitor(s) determines that the project may have an adverse effect on any special-status species (threatened, endangered, candidate, species of special concern, etc.), they must halt construction and notify the appropriate agencies immediately.

Verification: No fewer than 30 days prior to construction-related ground disturbance, the DB(s) and Biological Monitor(s) shall submit a resume highlighting their experience to USFWS and CDFW for review and comment and to the CPM for review and approval. No construction related ground disturbance, grading, boring, or trenching shall commence until an approved DB is available to be on site and communicates to the contractor that work may begin. If additional biological monitors are needed during construction the specified information shall be submitted to the CPM for approval at least 10 days prior to their first day of monitoring activities.

The DB(s) and Biological Monitor(s) shall not have the authority to handle any state-listed or special-status species unless authorized by CDFW; or handle any federal listed species unless authorized by USFWS. Handling, relocation, release from entrapment, or other interactions with wildlife shall be safe, practicable, and consistent with mitigation measures and permit conditions to relocate (actively or passively) wildlife out of harm's way. If safety or other considerations prevent the biological monitor from aiding trapped or entangled animals or animals in harm's way, the project owner or its designee shall consult with CDFW and/or USFWS, a wildlife rehabilitator, or other appropriate party to obtain aid for the animal, consistent with applicable mitigation measures and permit conditions. If consultation with CDFW and/or USFWS is required, the CPM shall be notified within one day of the consultation.

If a DB needs to be replaced, the specified information of the proposed replacement must be submitted to the CPM least 10 working days prior to the termination or release of the preceding DB. In an emergency, the project owner shall immediately notify the CPM to discuss the qualifications and approval of a short-term replacement while a permanent DB is proposed to the CPM for consideration.

The DB shall submit in the MCR to the CPM as described under **BIO-21** (BRMIMP) that includes the authorized DB(s) and Biological Monitor(s) assigned to the project and a summary of implementation of all Conditions of Certification (**BIO-1** through **BIO-22**).

The project owner shall ensure that the DB or Biological Monitor notifies the CPM immediately (and no later than the morning following the incident, or Monday morning in the case of a weekend) of any dead or injured special-status species or any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, or operation activities. The project owner shall notify the CPM of the circumstances and actions being taken to resolve the problem.

Whenever corrective action is taken by the project owner, a determination of success or failure shall be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner would be notified by the CPM that coordination with other agencies would require additional time before a determination can be made.

COC BIO-7/MM BIO-7 Conduct Pre-Activity Surveys for Special-Status Wildlife No later than seven (7) days prior to start of project construction or decommissioning activities, the Qualified Biologist(s) shall conduct surveys for special-status wildlife. Surveys shall include the project site and a 250-foot buffer (or larger as required by species specific measures) where legal access is available. Surveys shall focus on areas of potential habitat and special status species and should include inspections of potential microhabitats where smaller species could occur. Any special status wildlife found within the project site during surveys shall be allowed to leave on its own volition prior to the onset of construction. If species of special concern are found within the project site during surveys and shall not leave on its own volition, the species shall be relocated to the nearest suitable habitat outside of the project site. Species of special concern shall only be handled by qualified personnel as authorized by CDFW and/or USFWS under an issued state scientific collecting permit (SCP) or memorandum of understanding (MOU). Impacts or relocation of federally or state-listed species or state-listing candidate species are not authorized. If any State or federally listed, candidate, or proposed species are detected work shall be stopped and the project owner shall notify the CPM, CDFW, and or USFWS within 24-hours for further direction.

Verification: The DB shall submit information describing the findings of the surveys in the MCR (BRMIMP; **BIO-21**) to CDFW and the CPM. The information shall include the date, time, and duration of the surveys; identity of the surveyor(s); a list of all common and special-status species observed; locations of any special-status species identified, including any established avoidance buffers; and any actions taken at the direction of the CPM, CDFW, and/or USFWS to avoid or minimize impacts to special-status species.

Records of special-status species observed shall also be submitted to the CNDDB and shall include information specifying the type of observation, type of vegetation cover, slope, aspect, GPS location, observed behavior, presence of nests or young, and other relevant conditions noted. Positive observations of special-status species shall not be documented on publicly available databases.

COC BIO-8/ MM BIO-8 Biological Construction Monitoring The DB(s) and Biological Monitor(s) shall be retained to oversee project activities and to ensure compliance with biological resource mitigation measures and permit conditions set forth in **BIO-1** through **BIO-21** and outlined in the Biological Resources Mitigation Implementation and Monitoring Plan (**BIO-21**). Monitoring must include any special-status species during the pre-construction baseline survey or species-specific surveys and any areas identified as suitable habitat. Sensitive biological

resource areas shall be clearly marked and inspected at appropriate intervals for compliance with regulatory terms and conditions.

Prior to construction commencing each day, the Biological Monitor(s) shall inspect active construction areas where animals may have become trapped. At the end of the day, the Biological Monitor(s) shall inspect the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Areas with high vehicle activity (parking lots) shall be periodically inspected for animals in harm's way.

During all initial vegetation removal and ground-disturbing activities, a qualified biological monitor shall be onsite daily to ensure compliance with project mitigation measures and permit conditions. Upon completion of initial vegetation removal and ground-disturbing activities, the qualified biological monitor shall inspect the project site at least once weekly until construction or decommissioning activities are completed.

Verification: The DB(s) shall respond directly to inquiries of the CPM regarding biological resource issues. The DB(s) shall notify the project owner and the CPM immediately (and no later than the morning following the incident, or Monday morning in the case of a weekend) of any noncompliance with any biological resources Conditions of Certification, of any dead or injured special-status species, if there is a halt in any activities, and any corrective actions that have been taken, or shall be instituted, as a result of the halt.

Whenever corrective action is taken by the project owner, a determination of success or failure shall be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner would be notified by the CPM that coordination with other agencies would require additional time before a determination can be made.

The DB shall submit in the MCR to the CPM as described under **BIO-21** (BRMIMP) that includes a summary of implementation of all Conditions of Certification (**BIO-1** through **BIO-22**) during construction and decommissioning activities.

Records of special-status species observed shall also be submitted to the CNDDB and shall include information specifying the type of observation, type of vegetation cover, slope, aspect, GPS location, observed behavior, presence of nests or young, and other relevant conditions noted. Positive observations of special-status species shall not be documented on publicly available databases.

MM BIO-9 Desert Pupfish Protection and Relocation Plan Handling or relocation of desert pupfish shall require a Biological Opinion (BO) from USFWS and a Consistency Determination or 2081 Incidental Take Permit from CDFW. Handling of desert pupfish shall be conducted by individuals with a USFWS 10(a)(1)(a)

recovery permit or otherwise authorized by USFWS. No take of desert pupfish can occur prior to consultation with USFWS and CDFW.

If irrigation drains or ponded water at the end of drains shall require dewatering during construction or operation activities, the DB(s) shall prepare and implement a desert pupfish protection and relocation plan. This plan shall be submitted to CDFW and USFWS for review and comment and to the CPM for review and approval prior to any ground-disturbing activities that have a water component. This plan shall provide:

- Protocols for pre-activity surveys to assess species presence and spawning within or immediately adjacent to work areas (e.g., in, or at the end of, the irrigation drains/drain canals, and around pond margins). The protocols shall also outline the qualifications required for biologists to conduct desert pupfish survey, capture, and relocation activities and the process for biologist approval.
- Capture (e.g., trapping in the irrigation drains for construction and maintenance; or trapping, dip netting, and seining in ponds that are drained or if the water level is dropped) and transport methods to minimize handling and stress as well as exposure to heat, low dissolved oxygen (DO), and crowding.
- Monitor relocated desert pupfish for signs of stress/injury.
- Habitat assessment and suitability of locations for release of captured desert pupfish, including dissolved oxygen, salinity, and other parameters.
- Timing windows when construction or maintenance in shallow shoreline areas and in the irrigation drain mouths/canals may be conducted with minimal effects on desert pupfish spawning.
- Adaptive management procedures that include assessment of mitigation measure effectiveness, development of revised measures to improve effectiveness, and similar assessment of revised measures to verify effectiveness.

Verification: The project owner shall consult with USFWS, CDFW and the CPM prior to preparation of the dewatering plan to discuss the process for obtaining a BO from USFWS, a Consistency Determination or 2081 Incidental Take Permit from CDFW, and approved biologists for handling of desert pupfish.

Within 30 days prior to the initiation of dewatering activities, the DB(s) shall submit to Desert Pupfish Protection and Relocation Plan to USFWS and CDFW for review and comment, and to the CPM for review and approval. Modifications to the Desert Pupfish Protection and Relocation Plan shall only be made in coordination with USFWS, CDFW, and the CPM.

The DB shall submit information on the implementation of the Desert Pupfish Protection and Relocation Plan in the MCR (BRMIMP; **BIO-21**) to USFWS, CDFW, and the CPM. The information shall include the date, time, and duration of the

surveys; identity of the surveyor(s); number of individuals captures and relocated; agency-approved relocation sites; stress/injury observations of relocated desert pupfish; and any actions taken at the direction of the CPM, CDFW, and/or USFWS to avoid or minimize impacts.

Records of special-status species observed shall also be submitted to the CNDDB and shall include information specifying the type of observation, type of vegetation cover, slope, aspect, GPS location, observed behavior, and other relevant conditions noted. Positive observations of special-status species shall not be documented on publicly available databases.

COC BIO-10/ MM BIO-10 Invasive Species Management Plan The project owner shall develop and implement an Invasive Species Management Plan for those areas not being placed back into agricultural production. The purpose of this plan is to prevent invasive and exotic species from establishing themselves in the temporary disturbance areas. The Invasive Species Management Plan shall describe invasive and exotic species eradication and control methods, a reporting plan for management during and after construction, and shall include at least the following Best Management Practices to prevent the spread and propagation of invasive species:

1. Limit the size of any vegetation and/or ground disturbance to the absolute minimum, and limit ingress and egress to defined routes.
2. Maintain vehicle wash and inspection stations and closely monitor the types of materials brought onto the site.
3. Reestablish vegetation quickly on disturbed sites.
4. Monitoring and rapid implementation of control measures to ensure early detection and eradication for weed invasions.
5. Use only weed-free straw or hay bales used for sediment barrier installations and weed-free seed.
6. Implementation of BMPs and guidelines for invasive and exotic species as outlined in **BIO-4** (General Conservation Measures), Control of Invasive Species.

Verification: Within 30 days prior to the onset of construction, the project owner shall submit to the CPM a copy of the final Invasive Species Management Plan. All modifications to the Management Plan shall be made only after approval from the CPM.

Within 30 days after completion of project construction, the project owner shall provide to the CPM for review and approval a report identifying which items of the Invasive Species Management Plan have been completed, a summary of all modifications to invasive species measures made during the project's construction phase, and which items are still outstanding.

On January 31st of each year following construction until the completion of the revegetation monitoring specified in the Revegetation Plan (**BIO-11** Closure, Revegetation, and Rehabilitation Plan), the DB shall include information on invasive species management. Information includes abundance of invasive species in revegetated areas, identification of new sources of invasive species, and recommendations for remedial action, if warranted, planned for the upcoming year.

COC BIO-11/ MM BIO-11 Closure, Revegetation, and Rehabilitation Plan The project owner shall develop and implement Closure, Revegetation, and Rehabilitation Plan (Plan) that describes site restoration of temporary disturbed areas immediately following construction. The Plan shall identify semi-natural and native communities, sensitive natural communities, aquatic resource features, areas that shall be reverted areas back to previous land use, such as agricultural production. All temporarily disturbed areas not subject to long-term use or ongoing vegetation maintenance shall be revegetated with native species characteristic of the adjacent native vegetation communities. The Plan shall identify the total acreages of temporary disturbance to each of these communities, plant species used for revegetation efforts, locations of plantings, hydroseeding (including the species composition), hand-seeding, imprinting, soil and plant salvage, replacement of topsoil, and/or other appropriate method of restoration. The Plan shall include success criteria and monitoring specifications for a period no less than 5 years, or until success criteria are met. Target performance standards shall be included and based on typical vegetation cover of habitat communities in the region. The final plan shall include a cost estimate, adjusted for inflation, reflecting the costs of the revegetation and rehabilitation.

Verification: Within 6 months prior to the completion of construction, the project owner shall submit a Closure, Revegetation, and Rehabilitation Plan to CDFW for review and comment and to the CPM for review and approval. All modifications to the Revegetation Plan shall be made only after approval from the CPM.

Within 30 days after completion of project construction, the project owner shall provide to the CPM for review and approval a report identifying which items of the Closure, Revegetation, and Rehabilitation Plan have been completed, a summary of all modifications to revegetation measures during implementation (and approved by the CPM), and which items are still outstanding.

On January 31st of each year following construction until the completion of the revegetation monitoring period of 5 years, the DB shall provide a report to the CPM that includes: a summary of revegetation activities for the year, a discussion of whether revegetation performance standards for the year were met; and recommendations for revegetation remedial action, if warranted, planned for the upcoming year.

COC BIO-12/ MM BIO-12 Conduct Pre-Activity Surveys for Nesting Birds If project construction or decommissioning activities must occur during the breeding season for bird species (February 1 through August 31), a pre-activity survey for nesting birds shall be conducted by a DB(s) or Biological Monitor(s) no less than seven (7) and no more than three (3) days prior to initiating project activities.

Pre-Activity Surveys. Pre-activity surveys shall be conducted by the approved biologist at the appropriate time of day/night, during appropriate weather conditions. Surveys shall include the entire project site and all work areas, including staging and parking areas, plus a 500-foot buffer where legal access is available. Surveys shall focus on all areas within the project site and buffer care that could potentially support nesting birds and raptors, including trees, shrubs, bare ground, burrows, cavities, structures, equipment, and materials. Survey duration shall take into consideration the size of the area, density and complexity of the habitat, number of survey participants, and survey techniques employed. The survey duration shall be sufficient to ensure the data collected is complete and accurate.

Pre-activity surveys shall focus on both direct and indirect evidence of nesting, including nest locations and nesting behavior (e.g., copulation, carrying of food or nest materials, nest building, removal of fecal sacs, flushing suddenly from atypically close range, agitation, aggressive interactions, feigning injury or distraction displays, or other behaviors). If a nest is suspected, but not confirmed, the biologist(s) shall establish a disturbance-free buffer until the location can be inferred based on observations or until a determination can be made. The biologist(s) shall not risk failure of the nest to determine the exact location or status and shall make every effort to limit or avoid any potential nest predation as a result of the survey/monitoring efforts (e.g., limit number of surveyors, limit time spent at/near the nest, scan the site for potential nest predators before approaching, immediately depart nest area if indicators of stress or agitation are displayed). If a nest is observed, but thought to be inactive, the biologist(s) shall monitor the nest for one hour (four hours for raptors during the nonbreeding season) prior to approaching the nest to determine status. The biologist(s) shall use their best professional judgement regarding the monitoring period and whether approaching the nest is appropriate.

Buffers. If an active nest is detected, a 100-foot avoidance buffer for passerines, and a 500-foot avoidance buffer for raptors or pelicans, shall be established and clearly delineated by staking, flagging, and/or signage. The buffer shall be delineated to ensure that its location is known by all persons working within the vicinity but shall not be marked in such a manner that it attracts predators. Once the buffer is established, the biologist(s) shall document baseline behavior, stage of reproduction, and existing site conditions, including vertical and horizontal distances from proposed work areas, visual or acoustic barriers, and existing level

of disturbance. The avoidance and protection measures shall remain in effect until the nest is no longer active.

The project owner may identify species-specific buffer distances or variable distances, depending on activity levels (e.g., driving past the nest to access work sites may be less disruptive than vegetation clearing) for review and comment by CDFW and review and approval by the CPM. The extent of nest protection shall be based on proposed construction/decommissioning activities, species, human activities already underway when the nest is initiated (e.g., a house finch nest built in the eaves of an occupied structure would warrant less avoidance or protection than a loggerhead shrike nest build in native shrubland), topography, vegetation cover, and other factors.

Monitoring. The biologist(s) shall monitor the nest at the onset of project activities, and at the onset of any changes in project activities (e.g., increase in number or type of equipment, change in equipment usage, etc.), to determine the efficacy of the buffer. If the Biological Monitor(s) determines that project activities may be causing an adverse reaction/impact, then the Biological Monitor(s) shall adjust the buffer accordingly.

Any active nests and avoidance buffers shall be inspected weekly by the biologist(s) until the nest is determined to be inactive. If a nest is discovered during construction or decommissioning activities, all work in the area shall be immediately halted and/or relocated and an avoidance buffer (as defined above) shall be implemented.

Avoidance buffers may be reduced only with the approval of the CPM, in consultation with CDFW, or in accordance with the species-specific buffer distances approved the CPM in consultation with CDFW. Buffers can be reduced by the biologist(s) if it is determined that a reduced buffer shall not cause disturbance based on their best professional judgement and individual observations; the species present; the individual or pair's behavior(s); stage of reproduction; visual, acoustic, or other screening; and proximity and type of project activities (e.g., intensity and duration) being buffered.

Verification: Within 14 days prior to the nesting bird survey, the names and credentials of the biologists conducting the survey shall be submitted to the CPM for review and approval.

The DB shall submit information describing the findings of the pre-construction nest surveys in the MCR (BRMIMP; **BIO-21**) to CDFW and the CPM. The report shall include the time, date, and duration of the survey; identity and qualifications of the surveyor (s); list of species observed; results of the survey; and any designated buffer zones. The report(s) shall contain maps showing the location of all nests, species nesting, status of the nest (e.g., incubation of eggs, feeding of young, near fledging), and the buffer size around each nest.

Records of special-status species observed shall also be submitted to the CNDDB and shall include information specifying the type of observation, type of vegetation cover, slope, aspect, GPS location, observed behavior, presence of nests, dens, burrows, or young, and other relevant conditions noted. Positive observations of special-status species shall not be documented on publicly available databases.

COC BIO-13/ MM BIO-13 Yuma Ridgway's Rail Survey, Management, and Monitoring Monitoring Plan: A Yuma Ridgway's Rail Survey, Management, and Monitoring Plan shall be prepared prior to construction. The plan shall include the schedule for construction and operations activities within and adjacent to rail habitat and appropriate avoidance and minimization measures, including measures provided below and in BIO-14 (Yuma Ridgway Rail Species Noise Assessment and Abatement Plan).

Pre-Activity Surveys and Construction Monitoring: Pre-activity surveys and construction monitoring for Yuma Ridgway's rail shall be conducted by a biologist(s) approved by the CPM, in consultation with USFWS and CDFW. Surveys would be conducted within all project areas that contain suitable habitat and a 500-foot buffer from suitable habitat. If Yuma Ridgway's rail or other listed marshland bird species are detected within the work area (the area of active equipment use), all construction or decommissioning activities in the area shall halt and the USFWS and CDFW shall be notified no later than noon of the next business day. Project activities in the area may not proceed until the birds have left the work area.

Habitat Modification or Removal: Construction and decommissioning activities within or adjacent to suitable habitat for Yuma Ridgway's rail (i.e., cattail marsh, Invasive Southwest Riparian Woodland and Shrubland, and North American Arid West Emergent Marsh) shall be scheduled to avoid the nesting and molting flightless season (i.e., February 15 – September 15) unless surveys verity that no nesting is occurring.

Reduced Vehicle Speed Adjacent to Rail Habitat or Burrowing Owl Habitat: All employees, contractors, and visitors shall adhere to speed limits and to avoid any animals which may be encountered on or crossing the roads to and from the project area. Vehicle speeds shall be reduced to 15 mph within portions of any access road adjacent to or within 300 feet of any special-status species habitat, including Yuma Ridgway's rail or burrowing owl habitat, or within the 300 feet of any managed wildlife areas, such as Obsidian Butte, NWR, Imperial Wildlife Management Area Hazard Unit, or IID Managed Marsh Complex.

Verification: Within 30 days prior to initial construction or decommissioning activities within 500 feet of marshland habitat, the DB(s) shall submit a Yuma Ridgway's Rail Survey, Management, and Monitoring Plan to USFWS and CDFW for review and comment and to the CPM for review and approval. All modifications to the

Yuma Ridgway's Rail Survey, Management, and Monitoring Plan shall be made only after approval from USFWS, CDFW and the CPM.

The DB shall submit information describing the findings of the Yuma Ridgway's rail surveys in the MCR (BRMIMP; **BIO-21**) to CDFW and the CPM. The report shall include the time, date, and duration of the survey; identity and qualifications of the surveyor (s); list of species observed; results of the survey; locations of any special-status species identified; any designated buffer zones; and any actions taken at the direction of the CPM, CDFW, and/or USFWS to avoid or minimize impacts to special-status species. The report(s) shall contain maps showing the location of observations of special-status species and buffer zones. Ongoing monitoring and measure implementation for Yuma Ridgway's rails shall be document in subsequent MCRs and submitted to CDFW and the CPM.

Records of Yuma Ridgway rail or other protected species observed shall also be submitted to the CNDDB and shall include information specifying the type of observation, type of vegetation cover, slope, aspect, GPS location, observed behavior, presence of nests or young, and other relevant conditions noted. Positive observations of special-status species shall not be documented on publicly available databases.

COC BIO-14/ MM BIO-14 Yuma Ridgway Rail Species Noise Assessment and Abatement Plan Noise Assessment and Abatement Plan: The project owner, in coordination with the DB(s), shall prepare a Marshland Species Noise Assessment and Abatement Plan prior to activities within 500-foot from suitable rail habitat. The plan shall address potential noise impacts from grading, site clearing, pile driving, steam-blow noise levels, road maintenance work, and any other construction, operation, or decommissioning activities that could cause noise impacts. The following noise attenuation measures shall be implemented to minimize noise impacts on Yuma Ridgway's rail and other sensitive marshland species:

Breeding season activities (i.e., February 15 – September 15)

- At least 30 days prior to any maintenance activities within 500-feet of marshland habitat, the project owner shall conduct a noise study to evaluate the maximum predicted noise level within rail habitat.
- If the maximum predicted noise is less than 60 dBA Leq (Equivalent Continuous Level), no additional measures are required.
- If the maximum predicted noise level exceeds 60 dBA in marshland habitat, noise attenuation measures such as noise walls or hay bales can be implemented between the noise source and the suitable habitat to reduce noise levels. Noise monitors shall be installed at the edge of the nearest marshland habitat to assess the noise levels and verify that attenuation measures are successful. If necessary, additional noise reduction measures shall be

implemented to reduce the maximum noise level to below 60 dBA at the edge of occupied habitat.

- Ensure overall noise levels at the power plant site during the breeding season shall not exceed the threshold of an hourly average of 60 dBA at occupied habitat areas for during the first 3 hours of daylight (0.5 hours before civil sunrise through 2.5 hours after civil sunrise) and during the last 3 hours of daylight, typically before 9:00 AM and after 5:00 PM.
- Conduct regular inspections of project equipment, including pipes and valves associated with well pads to ensure proper operations do not exceed an hourly average sound level above 60 dBA in proximity to rail habitat during the breeding season during the first 3 hours of daylight (0.5 hours before civil sunrise through 2.5 hours after civil sunrise) and during the last 3 hours of daylight, typically before 9:00 AM and after 5:00 PM.

Non-breeding season activities (i.e., February 15 – September 16 – February 14)

- Work conducted outside the breeding season within a 500-foot buffer of potential marshland habitat that has the potential to exceed 80 dBA shall have an approved biological monitor present. If disturbance to marshland species is observed, all work shall stop and USFWS and CDFW shall be contacted for further guidance. Further guidance may include additional measures to protect rails at the direction of USFWS or CDFW.

Verification: Within 30 days prior to initial construction or decommissioning activities within 500 feet of marshland habitat, the project owner, in coordination with the DB(s), shall submit a Yuma Ridgway Rail Species Noise Assessment and Abatement Plan to USFWS and CDFW for review and comment and to the CPM for review and approval. All modifications to the Yuma Ridgway Rail Species Noise Assessment and Abatement Plan shall be made only after approval from USFWS, CDFW and the CPM.

The DB shall submit information on the implementation of the Yuma Ridgway Rail Species Noise Assessment and Abatement Plan in the MCR (BRMIMP; **BIO-21**) to CDFW and the CPM.

COC BIO-15/ MM BIO-15 Burrowing Owl Surveys, Monitoring, Prevention, and Relocation The project owner shall conduct burrowing owl surveys, monitoring, avoidance, and relocation in accordance with the applicable sections of the 2012 *CDFG Staff Report on Burrowing Owl Mitigation* (CDFG, 2012).

Areas Within Direct Disturbance: The DB(s) or Biological Monitor(s) shall conduct pre-activity surveys during the non-breeding season to determine the presence of colonizing owls that may have recently moved into the site, migrating owls, resident burrowing owls changing burrow use, and young of the year that may still be present and have not dispersed. A minimum of two surveys, spaced at least one week apart, shall be conducted by a qualified biologist, during the non-

breeding season, to ascertain the burrows that require exclusion and the ones that can be protected with no-disturbance buffers. Surveys shall be conducted on a weekly basis until exclusion has occurred.

Following the completion of pre-activity surveys, the Designated Biologist(s) shall submit a Burrowing Owl Exclusion Plan to CDFW for review and comment and to the CPM for review and approval. The Burrowing Owl Exclusion Plan shall follow guidance in Appendix E of the 2012 *CDFG Staff Report on Burrowing Owl Mitigation*. Burrowing owl exclusion shall only occur during the non-breeding season. If new burrows are formed or determined to be occupied within the construction impact area, exclusion activities as described in the Burrowing Owl Exclusion Plan shall be re-initiated. Burrowing owl exclusion can commence after approval of the plan from the CPM and CDFW. The plan shall include monitoring for at least one (1) week to verify owls have vacated the burrows owls prior to excavation and closure of the burrow.

Areas Outside Direct Disturbance: The DB(s) or Biological Monitor(s) shall monitor occupied burrowing owl burrows within 1,000 feet of project activities for at least 3 days prior to construction or decommissioning to determine baseline foraging behavior (i.e., behavior without construction). Additional monitoring during construction shall occur on a weekly basis to determine any signs of disturbance or changes to baseline behavior.

Nests shall not be disturbed during the breeding season (1 February through 31 August). During the breeding season, the DB(s) or Biological Monitor(s) shall implement a no disturbance buffer of 656 feet (200 meters) around active burrows. During the non-breeding season, the DB(s) or Biological Monitor(s) shall implement a no-disturbance buffer of 328 feet (100 meters) around inhabited burrows.

The buffer can be reduced if a qualified biologist, knowledgeable in burrowing owl behavior and approved by the CPM, in consultation with CDFW, determines a reduced buffer shall not result in disturbance to nesting or foraging behavior. Visual and noise barriers and other measures can be implemented to minimize disturbance during construction and decommissioning activities. If at any time, the qualified biologist determined that a burrow is no longer active, the no-disturbance buffer can be removed.

Verification: The DB(s) shall submit the Burrowing Owl Exclusion Plan outlining the burrows to be excluded, the approach for exclusion, and the approach for habitat creation under **BIO-16** (Burrowing Owl Habitat Preservation and Enhancement) to the CPM and CDFW within 14 days prior to implementation. All modifications to the Burrowing Owl Exclusion Plan shall be made only after approval from the CPM.

The DB shall submit information describing the findings of the burrowing owl surveys in the MCR (BRMIMP; **BIO-21**) to CDFW and the CPM. The report shall

include the time, date, and duration of the survey; identity and qualifications of the surveyor (s); list of species observed; results of the survey; numbers of active burrows observed; any designated non-disturbance buffers; burrows proposed for exclusion; and any actions taken at the direction of the CPM or CDFW to avoid or minimize impacts to special-status species. The report(s) shall contain maps showing the location of observations of active burrows, non-disturbance buffers, and burrows proposed for exclusion. Information shall also be provided on inactive burrows, how the determination was made, and approach for excavation and closure. Ongoing monitoring and measure implementation for burrowing owls shall be document in subsequent MCRs and submitted to CDFW and the CPM.

Records of burrowing owl observations shall also be submitted to the CNDDB and shall include information specifying the type of observation, type of vegetation cover, slope, aspect, GPS location, observed behavior, presence of nests or young, and other relevant conditions noted. Positive observations of special-status species shall not be documented on publicly available databases.

COC BIO-16/ MM BIO-16 Burrowing Owl Habitat Preservation and Enhancement The project owner, in coordination with the DB(s), shall conduct burrowing owl preservation and enhancement in suitable habitat for burrowing owls displaced during construction activities. The project owner shall prepare a Burrowing Owl Habitat Preservation and Enhancement Plan in accordance with Appendix F of the 2012 *CDFG Staff Report on Burrowing Owl Mitigation* for review and comment by CDFW and for review and approval by the CPM prior to implementation. The Plan shall include the following components.

Burrow Sites: The project owner shall enhance or create new burrows at a 2:1 ratio for any active burrow requiring exclusion, closure, and relocation due to project activities. Enhancement may include clearing of debris or enlarging existing mammal burrows. Mitigation lands should be on, adjacent to, or proximate to the impact site where possible and where habitat is sufficient to support burrowing owls' presence. Where there is insufficient habitat on, adjacent to, or near project sites, selected mitigation lands should focus on consolidating and enlarging conservation areas known to support burrowing owl populations. If these two options are not available, the mitigation land requirement shall be increased in consultation with CDFW.

Foraging Habitat: The project owner shall replace foraging habitat that is permanently destroyed shall be replaced at a 1:1 ratio. Foraging habitat shall be suitable for the protection of burrowing owls. Replacement shall be through the preservation of comparable habitats or enhancement of habitat through vegetation restoration and habitat characteristics suitable for burrowing.

Temporarily Impacted Areas: Temporarily disturbed burrowing owl habitat shall be restored to pre-project condition including decompacting soil and revegetating. Additional burrowing owl creation or enhancement shall be conducted for

temporary impacts that render a nesting site (nesting burrow and satellite burrows) unsustainable or unavailable for use or occupation by burrowing owls due to project activities.

Verification: The project owner, in coordination with the DB(s), shall submit Burrowing Owl Habitat Preservation and Enhancement Plan to the CPM and CDFW within 30 days after completion of exclusion activities. All modifications to the Burrowing Owl Exclusion Plan shall be made only after approval from the CPM. The Plan shall include exclusion methods, impact criteria, lands that could serve as receptor sites for evicted burrowing owls, management practices for mitigation lands identified in consultation with the agencies, burrow replacement ratios, cleaning and maintenance methods for replacement burrows, monitoring requirements, and evaluation criteria for determining success of the burrowing owl relocation efforts. If the plan includes formal acquisition of mitigation lands, the project owner shall submit a Property Analysis Record (PAR) or PAR-like analysis for the parcels for review and comment by CDFW and for review and approval by the CPM.

No later than 18 months after approval of the Burrowing Owl Habitat Preservation and Enhancement Plan, the project owner shall provide written verification to the CPM and CDFW that the compensation lands or conservation easements have been acquired and recorded in favor of the approved recipient.

On January 31st of each year following construction for a period of five years, the DB shall provide a report to the CPM and CDFW that describes the results of monitoring and management of the burrowing owl relocation area.

COC BIO-17/ MM BIO-17 Habitat Conservation or Restoration Plan Permanent impact to all natural and semi-natural vegetation communities, including but not limited to, tamarisk thickets, Typha herbaceous alliance, iodine bush shrub, and desert holly scrub, shall be compensated through habitat compensation and/or habitat restoration at a minimum of a 1:1 ratio. Habitat compensation shall be accomplished through land preservation, in perpetuity, of CPM-approved lands supporting comparable vegetation communities and habitats to those lands impacted by the project. Habitat restoration may be appropriate as compensation for permanent impacts provided that the restored lands are protected in perpetuity and the restoration effort is implemented pursuant to an CPM-approved Habitat Restoration Plan, which includes success criteria and monitoring specifications as described in **BIO-11** (Closure, Revegetation, and Rehabilitation Plan). All habitat compensation and restoration lands used as mitigation for the project shall include long-term management and legal protection assurances.

Verification: The project owner, in coordination with the DB(s), shall submit a Habitat Conservation or Restoration Plan to the CPM within 90 days prior to completion of construction activities. All modifications to the Plan shall be made only after approval from the CPM.

Conservation or restoration lands can be included with Burrowing Owl Habitat Preservation and Enhancement lands (**BIO-16**) if it can be shown that these areas also provide equivalent coverage of one or more natural and semi-natural vegetation communities impacted by the project.

No less than 90 days prior to acquisition of the habitat compensation lands, the project owner, or an approved third party, shall submit a formal acquisition proposal to the CPM and CDFW describing the conservation or restoration lands intended for purchase. At the same time the project owner shall submit a PAR or PAR-like analysis for the parcels for review and comment by CDFW and for review and approval by the CPM.

No later than 18 months after approval of the Habitat Conservation or Restoration Plan, the project owner shall provide written verification to the CPM and CDFW that the compensation lands or conservation easements have been acquired and recorded in favor of the approved recipient.

On January 31st of each year following construction for a period of five years, the DB shall provide a report to the CPM and CDFW that describes the results of monitoring and management of the conservation or restoration lands. The report shall describe which items of the Habitat Conservation or Restoration Plan have been completed, a summary of all modifications to revegetation measures made during the project's construction phase, and which items are still outstanding.

COC BIO-18/ MM BIO-18 American Badger, Desert Kit Fox, and Yuma Hispid Cotton Rat Avoidance and Minimization Measures No more than 14 days prior to construction or decommissioning activities, the DB(s) shall conduct pre-activity surveys for American badger and desert kit fox dens, and cotton rats' runways and connecting burrows, in the project site and a 250 ft buffer around the project site. If dens or burrows are detected, each den/burrow shall be classified as inactive, potentially active, or definitely active.

Inactive dens or burrows that would be directly impacted by construction activities shall be excavated by hand or mechanized equipment under the direct supervision of a qualified biologist and backfilled to prevent use or reuse.

A 250-foot avoidance buffer shall be placed around any potentially active or definitely active dens or burrow. Vegetation removal or grading activities shall be avoided within the buffer of any potentially and definitely active den or burrow. The avoidance buffer may be adjusted following coordination with the CPM and CDFW provided the buffer reductions would not result in adverse impacts to the species.

Potentially and definitely active dens or burrows that would be directly impacted by construction activities shall be monitored by the Biological Monitor for three consecutive nights using a tracking medium (such as diatomaceous earth or fire

clay) and/or infrared camera stations at the entrance. If no tracks are observed in the tracking medium or no photos of the target species are captured after three nights, the den or burrow shall be excavated by hand or mechanized equipment under the direct supervision of a qualified biologist to ensure that no wildlife are trapped, and backfilled to prevent use or reuse.

If tracks are observed, and activities are proposed during the breeding season of badger or kit fox (February 1 through July 1) or cotton rat (year-round), the DB shall implement a 250-ft buffer around the den or burrow. No construction activities shall occur within the buffer until the biologist had determined the den or burrow is no longer in use, or not being used for breeding activities.

If tracks are observed, and activities are proposed outside the breeding season of badger or kit fox, or within the winter season of cotton rat (December 15-February 28), the den or burrow shall be progressively blocked with natural materials (rocks, dirt, sticks, and vegetation piled in front of the entrance) for the next three to five nights to discourage continued use. Vegetation removal with non-motorized equipment (hand tools) shall be conducted around the den or burrow to also discourage continued use. After verification that the den or burrows is unoccupied, either through the tracking medium or negative photos, it shall be excavated by hand or mechanized equipment under the direct supervision of a qualified biologist to ensure that no wildlife are trapped, and backfilled to prevent use or reuse.

Verification: The DB shall submit information describing the findings of the surveys and monitoring in the MCR (BRMIMP; **BIO-21**) to CDFW and the CPM. The information shall include the date, time, and duration of the surveys; identity of the surveyor(s); a list of special-status species observed; locations of any dens or burrows identified and their classification (inactive, potentially active, or definitely active); established avoidance buffers; results of tracking medium or camera stations; discouragement measures; and any actions taken at the direction of the CPM, CDFW, and/or USFWS to avoid or minimize impacts to special-status species.

Records of special-status species observed shall also be submitted to the CNDDB and shall include information specifying the type of observation, type of vegetation cover, slope, aspect, GPS location, observed behavior, presence of nests or young, and other relevant conditions noted. Positive observations of special-status species shall not be documented on publicly available databases.

COC BIO-19 Facility Pond Wildlife Escape and Monitoring Plan The project owner shall incorporate design features to allow escape of wildlife that may enter the ponds within the facility. These may include, but are not limited to, gradual slopes, side traction to facilitate upward movement, escape ramps, floating platforms, and/or wildlife ledges. Prior to construction of the facility ponds, the project owner will submit a Facility Pond Wildlife Escape and Monitoring Plan to CDFW for review and comment and to the CPM for review and approval. The plan will outline the wildlife escape methods, procedures for handling dead or injured wildlife, wildlife

rehabilitation centers that take injured animals, and schedule for monitoring during the first year of pond operation.

The project owner, DB(s), or Biological Monitor(s) shall monitor the facility ponds at least once per month starting with the first month of operation of the facility ponds. The purpose of the surveys shall be to determine if wildlife are using the facility ponds and any injury or mortality as a result of use. Operations staff at the project site shall also report finding any dead or injured birds or other wildlife at the facility ponds to the DB(s) within one day of the detection.

If after 12 consecutive monthly site visits no bird or wildlife injury or deaths are detected by or reported to the DB(s), no further monitoring would be required. If any dead bird or other wildlife at the facility ponds is detected by Operations staff, the CPM and the DB(s) shall be notified immediately. Corrective actions shall be implemented at the direction of the DB(s) and the CPM to prevent future injury or mortality of birds and wildlife.

In addition to the requirements above, the project owner may suggest adaptive management measures to remedy any problems that are detected during monitoring or post-monitoring activities. Implementation of adaptive management measures shall be made only after approval from the CPM, in consultation with CDFW.

Verification: The project owner, in coordination with the DB, shall submit the Facility Pond Wildlife Escape Plan outlining the methods to facilitate wildlife escape should wildlife access the facility ponds, method for handling dead and injured wildlife, wildlife rehabilitation centers, and the schedule for monitoring during the first year of pond operation. The plan shall be submitted to CDFW for review and comment and to the CPM for review and approval within 14 days prior to construction of the facility ponds. All modifications to the Facility Pond Wildlife Escape Plan shall be made only after approval from the CPM.

The DB(s) shall notify the project owner and the CPM within one day (or Monday morning in the case of a weekend) of any dead or injured special-status species as a result of the facility pond.

The DB shall submit results of the facility pond monitoring and any detection of dead or injured wildlife in the MCR under **BIO-21** (BRMIMP) to the CPM and CDFW.

Whenever corrective action is taken by the project owner, a determination of success or failure shall be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner would be notified by the CPM that coordination with other agencies would require additional time before a determination can be made.

COC BIO-20/ MM BIO-20 Avian Collision Deterrent Proposal and Monitoring Plan The project owner shall prepare an Avian Collision Deterrent Proposal and Monitoring Plan in consultation with a working group of interested agency personnel, including personnel from CDFW and USFWS. This plan shall incorporate Suggested Practices for *Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006) guidelines and provide specific details on design, placement, and maintenance of line markers, as well as the associated analysis requested.

The plan shall detail the monitoring methods and duration, methods for estimating carcass persistence and searcher efficiency, impact thresholds (i.e., number of collision deaths), and remedial actions to be implemented during operations. The statistical methods to be used to compare collisions deaths at the proposed gen-tie line and sections of unmarked but comparable gen-tie line in the project area shall also be described in the plan. The Plan shall include detailed specifications on data and carcass collection protocol and a rationale justifying the proposed schedule of carcass searches. The Plan shall also include seasonal trials to assess bias from carcass removal by scavengers as well as searcher bias. Incidental observations of avian or wildlife mortality shall be reported to the monitoring personnel in charge of reporting.

Gen-tie lines and all electrical components shall be designed, installed, and maintained following APLIC guidelines to reduce the likelihood of electrocutions of birds. The project owner shall install a CPM-approved marker on the grounding wire of the proposed gen-tie lines. These markers shall be placed and maintained on the highest-bird-use portions of the proposed gen-tie lines.

The project owner must implement the remedial actions that are approved by the working group of interested agency personnel wherever high bird use and evidence of bird collisions are found during post-construction monitoring and measure the effectiveness of the remedial actions for reducing impacts for at least one year following their implementation.

Monitoring of the entire proposed gen-tie line, and sections of unmarked but comparable gen-tie line in the project area, shall be implemented for the first two (2) years of operation. If impacts are found to be excessive by a working group of interested agency personnel, monitoring shall continue, up to a period of 10 years, to determine effectiveness of remedies. The project owner shall observe the areas under power gen-tie lines during the course of regularly scheduled duties to informally monitor for birds that have struck the gen-tie lines.

Verification: No less than 30 days prior to the installation of the gen-tie \, the project owner shall submit the Avian Collison Deterrent Proposal and Monitoring Plan to the CPM. The plan shall include a description of APLIC design features and plan for monitoring the gen-tie line over the two-year period.

The DB shall submit information describing the implementation and monitoring in the MCR (BRMIMP; **BIO-21**) to USFWS, CDFW and the CPM. The information shall include a detailed description of any Project-related avian deaths or injuries detected during the monitoring study or at any other time. The MCR shall summarize all avian related injuries or fatalities to date, analyzes any project-related avian fatalities or injuries detected, and provide recommendations for future monitoring and any adaptive management actions needed.

COC BIO-21/ MM BIO-21 Biological Resources Mitigation Implementation and Monitoring Plan The project owner shall develop a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and shall submit the proposed BRMIMP to the CPM for review and approval. The project owner shall implement the measures identified in the approved BRMIMP. The BRMIMP shall incorporate avoidance and minimization measures described in final versions of all plans required under **BIO-1** through **BIO-22**.

The BRMIMP shall be prepared in consultation with the DB and shall include accurate and up-to-date maps depicting the location of sensitive biological resources that require temporary or permanent protection during construction and operation. The BRMIMP shall include complete and detailed descriptions of the following:

1. All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the project owner.
2. All biological resources conditions of certification identified as necessary to avoid or mitigate impacts.
3. All biological resources mitigation, monitoring, and compliance measures required in federal and state agency terms and conditions.
4. All biological resources mitigation, monitoring, and compliance measures required in local agency permits, such as site grading and landscaping requirements.
5. All sensitive biological resources to be impacted, avoided, or mitigation by project construction, operation, and closure.
6. All required mitigation measures for each sensitive biological resource.
7. Required habitat compensation strategy, including provisions for acquisition, enhancement, and management for any temporary and permanent loss of sensitive biological resources.
8. A detailed description of measures that shall be taken to avoid or mitigate temporary disturbances from construction or decommissioning activities.
9. All locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction.

10. Aerial photographs, at an approved scale, of all areas to be disturbed during project construction or decommissioning activities – one set prior to any site or related facilities mobilization disturbance and one set subsequent to completion of project construction; include planned timing of aerial photography and a description of why times were chosen.
11. Duration for each type of monitoring and a description of monitoring methodologies and frequency.
12. Performance standards to be used to help decide if/when proposed mitigation is or is not successful.
13. All performance standards and remedial measures to be implemented if performance standards are not met.
14. A discussion of biological resources-related facility closure measures.
15. A process for proposing plan modifications to the appropriate agencies for review and comment and to the CPM for review and approval.
16. A copy of all biological resources permits obtained.
17. A requirement to submit any sightings of any special-status species that are observed on or in proximity to the project site, or during project surveys, to the California Natural Diversity Data Base (CNDDB) per CDFW requirements.
18. Include all mitigation measures and their implementation methods in the BRMIMP.

Verification: The project owner shall submit the final BRMIMP to the CPM at least 30 days prior to start of any pre-activity site mobilization and construction-related ground disturbance, grading, boring, and/or trenching. The BRMIMP shall contain the required measures included in all biological COC/MM. No construction-related ground disturbance, grading, boring or trenching may occur prior to approval of the final BRMIMP by the CPM. Any changes to the approved BRMIMP must be approved by the CPM and in consultation with CDFW and USFWS.

If any permits have not yet been received when the BRMIMP is first submitted, these permits shall be submitted to the CPM within 5 days of their receipt, and the BRMIMP shall be revised or supplemented to reflect the permit condition within at least 10 days of their receipt by the project owner.

To verify that the extent of construction disturbance does not exceed that described in this analysis, the project owner shall submit aerial photographs, at an approved scale, taken before and after construction to the CPM. The first set of aerial photographs shall reflect site conditions prior to any pre-activity site mobilization and construction-related ground disturbance, grading, boring, and trenching, and shall be submitted at least 60 days prior to initiation of such activities. The second set of aerial photographs shall be taken after completion of construction and shall be submitted to the CPM no later than 90 days after

completion of construction. The project owner shall also provide a final accounting of the acreages of vegetation communities/cover types present before and after construction.

Implementation of BRMIMP measures (for example, construction or decommissioning activities that were monitored, species observed) shall be reported in the MCRs by the DB(s). The MCRs shall continue for any required post-construction monitoring activities.

Within 30 days after completion of project construction and all required monitoring activities, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's pre-activity site mobilization and construction-related ground disturbance, and a summary of all required post-construction monitoring activities.

COC BIO-22/ MM BIO-22 Provide Evidence of Applicable Jurisdictional Waters Permits The project shall avoid wetland and water loss to the greatest extent possible when placing facility features. The project owner shall implement the following measures to avoid, minimize and mitigate for direct and indirect impacts to waters of the state.

The project shall comply with all applicable laws and regulations regarding requirements of the United States Army Corps of Engineers and the Regional Water Quality Control Board for aspects of the project, if any, which fall within those agencies' respective purview, including obtaining any permits required for the construction, as well as compliance with any additional conditions attached to any required permits and monitoring requirements (if any). Copies of all regulatory waters permits shall be submitted to the CPM prior to ground-disturbing activities in areas supporting jurisdictional waters.

The project owner shall acquire, in fee or in easement, a parcel or parcels of land for any permanent impacts, up to 58.78 acres, to compensate for impacts to state and federal jurisdictional waters. The project owner shall provide financial assurances to the CPM and CDFW to guarantee that an adequate level of funding is available to implement the acquisitions and enhancement of state waters as described in this condition. These funds shall be used solely for implementation of the measures associated with the project. Financial assurance can be provided to the CPM and CDFW in the form of an irrevocable letter of credit, a pledged savings account or Security prior to initiating ground-disturbing project activities.

The project owner shall submit to the CPM and CDFW a draft Management Plan that reflects site-specific enhancement measures for the aquatic resources on the acquired compensation lands. The objective of the Management Plan shall be to enhance the wildlife value of the drainages, and may include enhancement actions such as weed control, livestock exclusion, or erosion control.

Verification: Within 30 days prior to ground-disturbing activities in areas supporting jurisdictional waters, the project owner shall submit the following: all copies of jurisdictional waters permits; a discussion of work in in areas supporting jurisdictional waters; written verification of financial assurance for compensation lands acquisition up to 58.78 acres, for any permanent impacts to state and federal jurisdictional waters. This information shall be provided in the MCR (BRMIMP; **BIO-21**) submitted to USFWS, CDFW and the CPM.

The project owner, or an approved third party, shall provide the CPM and CDFW with a Compensatory Mitigation Management Plan for the compensation of impacted jurisdictional waters and associated management funds within 180 days of the land or easement purchase, as determined by the date on the title. The CPM shall review and approve the management plan, in consultation with CDFW.

Within 90 days after completion of project construction, the project owner shall provide to the CPM and CDFW an analysis with the final accounting of the amount of jurisdictional state waters disturbed during project construction to verify no additional compensatory mitigation is needed.

The project owner shall notify the CPM and CDFW of any proposed change in impacts to jurisdictional waters or compensatory mitigation efforts. The notifying report shall be provided to the CPM and CDFW no later than seven days after the changes are identified. A copy of the notifying change of conditions report shall be included in the MCR (BRMIMP; **BIO-21**) submitted to USFWS, CDFW and the CPM.

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5.2.7 Appendix A – Relevant Technical Studies in Docket Log

A list of the relevant technical studies and reports available on the MBGP Docket Log (23-AFC-01) are provided below. This data was reviewed and incorporated into the analysis of the EIR where appropriate. Staff augmented this data when necessary and made conclusions based on an independent review of the data and an evaluation of potential impacts that may occur from the development of the MBGP.

- *TN249723 AFC Volume 1* (dated April 18, 2023)
- *TN249725 AFC Appendix 5-2 Biological Resources* (dated April 18, 2023)
- *TN249728 AFC Appendix 2 Project Description* (dated April 18, 2023)
- *TN249729 AFC Volume 1 Appendix 1 Executive Summary* (dated April 18, 2023)
- *TN253188 Revised General Arrangement Refinement* (dated November 17, 2023)
- *TN253190 MBGP Data Request Response Set 1 (Revised Responses to Data Requests) Notice Letter to ICAPCD* (November 17, 2023) – Revised Figure 1-4R Project Location, which provides a revised the location and orientation of the offsite wells and associated well pads.
    - *TN253276 MBGP CEC Data Requests Set 3* (November 21, 2023) – Request for information on whether the construction and laydown parking area for the construction of MBGP would still be available with the relocation of the plant site (DR 5-6).
    - *TN253703 MBGP Data Response Set 3 (Responses to Data Requests 1 to 8)* (December 21, 2023) – The applicant stated that the Figure 1-4R shows the portions of the parcel proposed to be used for laydown/parking.

Information relevant to burrowing owls:

- *TN251204 Report of Conversations, Burrowing Owl Approach to Data Adequacy for Berkshire Hathaway Geothermal Projects* (dated July 27, 2023) – As the applicant had missed the window of time to conduct surveys, CDFW would support a deviation from the 2012 CDFW survey guidelines.
- *TN252791 Preliminary Burrowing Owl Survey Report* (dated October 27, 2023) – Summarizes the survey methods and the impact evaluation results of breeding season burrowing owl surveys conducted for all three proposed geothermal projects on June 5-9, July 10-12, and August 14-16, 2023.
- *TN253493 Appendix A 2023 Burrowing Owl Breeding Season Proposed Methods* (dated December 4, 2023) – Figure 2 Burrowing Owl Observations.
- *TN253494 Appendix E Representative Burrowing Owl at Burrow Photographs* (dated December 4, 2023).

- *TN253495 Appendix G Occupied Burrow Photographs Within the Biological Study Areas* (dated December 4, 2023).
- *TN253492 Maps of burrowing owl survey results* (dated December 4, 2023) – Figures 5 (Overview of Burrowing Owl Survey Results), 8a, 8b (MBGP Burrowing Owl Survey Results)
- *TN254834 Burrowing Owl Survey Report* (dated March 4, 2024) – Survey methods and the impact evaluation results of breeding and nonbreeding season burrowing owl surveys conducted for all three proposed projects.

Information relevant to Yuma Ridgway rails:

- *TN251679 Distribution and Occupancy of Yuma Ridgway's Rails Report, Public Version* (dated August 18, 2023) – This report summarized surveys conducted in Spring 2022.

Information relevant to desert pupfish:

- *TN251680 Desert Pupfish Habitat Map* (dated August 18, 2023). Figure DA 5.2-1c, Desert Pupfish Habitat

Information relevant to aquatic resources:

- *TN252694 MBGP Approved Jurisdictional Determination Request* (dated October 24, 2023). Aquatic Resources Delineation Request submittal to U.S. Army Corps of Engineers (USACE).
    - Included the Aquatic Resources Delineation Report (Attachment 2).
    - Aquatic Resource Delineation Documentation was also provided in the AFC Volume 2 Appendix 5-2 Biological Resources (TN249725, Appendix 5.2C).

Other information relevant to this analysis:

- *TN250066 Morton Bay Geothermal Project, Staff's Data Adequacy Recommendation* (dated May 8, 2023) – CEC staff determined that the MBGP AFC does not meet all requirements, including biological resources, listed in California Code of Regulations, title 20, section 1740, Appendix B. CEC requested additional information on geothermal steam flashing; Yuma Ridgway rail protocol surveys; California black rail findings; impacts on the Sonny Bono Salton Sea National Wildlife Refuge (NWR), Imperial Wildlife Area, and Hazard Tract and species that occur there; effects on Alamo River; foraging species and mitigation for loss of foraging habitat; desert pupfish; mountain plover; details of preconstruction surveys; revegetation and weed monitoring plan; details on jurisdictional features; Closure, Revegetation, and Rehabilitation plan, and financial securities; compensatory mitigation for burrowing owl; design features for thermal discharge from stream flashing; agency correspondence; and permit requirements.

- *TN250396 MBGP Data Adequacy Response Set 1* (dated May 30, 2023) – Response to CEC data adequacy review. Answers to biological resources concerns would be provided in June 2023.
- *TN250679 BHER MBGP 23-AFC-02 Data Adequacy Supplement Set 2* (dated June 20, 2023) – The applicant responded to the CEC data request TN250066.
- *TN251027 MBGP Data Adequacy Recommendation (23-AFC-02)* (dated July 12, 2023) – CEC review of data adequacy response regarding TN250066. Biological resource information is determined to be adequate.

- *TN252095 MBGP Data Request Set 1* (dated August 31, 2023) – The CEC requested data regarding brine ponds (DR 19-21), atmospheric flash system (DR 22-24), and vegetation mapping (DR 25-26).
  - *TN252491 MBGP Data Request Response Set 1, Part 1* (dated October 2, 2023) – Applicant Response to TN252098 CEC Data Request Set 1.
    - This included Attachment DRR 21 Formal Consultation for the CalEnergy Obsidian Energy LLC Salton Sea Unit 6 Geothermal Power Plant, dated 2003. The consultation concerns possible effects on Yuma clapper rail (now Yuma Ridgway's rail), California brown pelican, and desert pupfish. Project avoidance and minimization measures for the CalEnergy project include a DB, worker training, construction area demarcation, Biological Resources Mitigation Implementation and Monitoring Plan, drainage and erosion, construction noise abatement, well pad construction standards, light shielding, wildlife monitoring, construction monitoring, speed limit, revegetation, burrowing owl program, trench covers and inspection, bird flight diverter installation, firearm and pet prohibition, shut-down maintenance outside of shorebird breeding season, habitat creation/enhancement for Yuma clapper rail, and spill prevention and response. Terms and conditions included a noise measure to reduce impacts, construction windows outside of the breeding period for Yuma clapper rails, protocol level surveys for rails, and proposed land acquisition and habitat enhancements.
  - *TN252552 Data Request Response Set 1* (dated October 10, 2023) – Figure DRR 25 Land Cover and Vegetation Types.

- *TN252740 MBGP CURE Data Requests Set 1* (October 25, 2023) – CURE requests additional information about the impacts to biological resources along the proposed IID transmission lines (Data Request 50-51).
  - *TN253112 Applicant's Notice Pursuant to 20 CCR § 1716(f) for CURE's Data Requests Set 1* (dated November 14, 2023) – The applicant stated that that information is not reasonably available and objects to the request for the

reason that information regarding the IID transmission lines are not finalized.

- *TN253340 MBGP Cover Letter and CURE Data Requests Set 2* (November 27, 2023) – CURE requests additional information about the impacts to agriculture (Data Requests 150-151), special-status birds (152-169), land cover (170-179), desert pupfish, canals and drains (180-185), restoration of temporary impacts (186-190), agricultural land and regionally important habitat (191), burrowing owl mitigation (192-196), construction mitigation (197-200), construction monitoring (201-206), lighting (207-209), cumulative impacts (210-212), avian collisions (213-218), mitigation for burrowing owl relocation (219-224), drilling mud (225-227), noise impacts (228-236), and preconstruction surveys (237-244).
    - *TN253654 Applicant's Notice Pursuant to 20 CCR § 1716(f) for CURE's Data Requests Set 2* (December 18, 2023) – Applicant requests additional time and objects to requests for "all documentation" and vague, overbroad or burdensome requests for data request 154, 156, 158, 160, 162, 166, 169, 173, 175, 180, 184, 185, 191, 200, 226, 232, 233, 234, and 243.
    - *TN254015 MBGP CURE Data Response Set 2* (January 19, 2024) – Applicant responses to TN253340 (Data Request 100-244). Responses included a reference to TN253618 regarding agricultural land use and crops grown in fields impacted by the project (Data Request 150-151).

- *TN253870 CEC Data Requests Set 4* (dated January 12, 2024) – CEC requests information regarding production wells and pad placement alternatives and potential inundation risk of project facilities and potential impacts to desert pupfish and Yuma Ridgway's rail that may occur as a result of inundation (Data Requests 15-17).
    - *TN254294 Applicants Notice Pursuant to CCR § 1716(f) for CEC's Data Requests Set 4* (dated February 2, 2024) – Applicant requests additional time to respond to CEC's Data Request 4 and provides notice of objection to non-biological related requests.
    - *TN254419 Applicants Data Response Set 4 (Responses to Data Requests 1 to 43)* (dated February 12, 2024) – Applicants response to Data Request 15-17.

- *TN254077 Cover letter with CURE Data Requests Set 4* (January 22, 2024) – CURE requests additional information about the established biological survey and study area (Data Requests 265-269), land cover and habitat mapping (270-271), canals, drains, and desert pupfish (272-274), and noise impacts (275).
    - *TN254603 MBGP CURE Data Response Set 4 (Responses to Data Requests 252 to 279)* (dated February 21, 2024) – Applicant responses to Data Request 265-275 regarding biological resources.

- *TN256084 MBGP Status Report No 7 (April 30, 2024)* – Applicant provided an updated on the status of the FEMA Letter of Map Revision (still under review).

5.3 Climate Change and Greenhouse Gas Emissions

Tao Jiang and Andres Perez

5.3.1 Environmental Setting

This section describes the environmental and regulatory setting and potential impacts to the environment caused by the proposed project greenhouse gas (GHG) emissions. Unlike emissions of criteria and toxic air pollutants, which have regional and localized impacts, GHG emissions relate to the broader impact of global climate change.

Existing Conditions

Global warming associated with the "greenhouse effect" is a process whereby GHGs accumulating in the atmosphere contribute to an increase in the temperature of the Earth's atmosphere. The principal GHGs that contribute to global warming and climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), black carbon, and fluorinated gases (F-gases) (hydrofluorocarbons [HFCs], perfluorocarbons [PFCs], and sulfur hexafluoride [SF_6]). Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the transportation, industrial/manufacturing, utility, residential, commercial, and agricultural sectors.

Each GHG has its own potency and effect upon the Earth's energy balance, expressed in terms of a global warming potential (GWP), with CO_2 being assigned a value of one (1.0). Specifically, the GWP is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given time relative to the emissions of 1 ton of CO_2. The larger the GWP, the more that a given gas warms the Earth compared to CO_2 over that time. The time usually used for GWPs is 100 years. The F-gases are sometimes called high-GWP gases because, for a given amount of mass, they trap substantially more heat than CO_2. The GWPs for these gases can be in the thousands or tens of thousands. The carbon dioxide equivalent (CO_2e) mass emission rate for a source is obtained by multiplying the mass of each GHG by the assigned GWP for that compound and then adding the results of this product together to obtain a single, mass emission rate in terms of CO_2e that represents the combined effects of the GHGs.

California Emissions Inventory

California is a contributor to global GHG emissions. The total gross California GHG emissions in 2021 were 381.3 million metric tons of CO_2-equivalent ($MMTCO_2e$) (CARB 2023). The largest category of GHG emissions in California is transportation, followed by industrial activities and electricity generation in state and out of state.

In 2021, the total gross U.S. greenhouse gas emissions were 6,340.2 $MMTCO_2e$, or 5,586.0 $MMTCO_2e$ after accounting for sequestration from the land sector (U.S. EPA 2024). Nationwide GHG emissions in 2021 rebounded from 2020 levels that were lower than 2019 because of a sharp decline due to the impacts of the coronavirus (COVID-19)

pandemic on fossil fuel combustion, related to travel and economic activity (CARB 2023, U.S. EPA 2024).

Imperial County Emissions Inventory

Imperial County completed a baseline GHG emissions inventory as a part of a regional climate action planning process (Ascent 2021). In 2018, the unincorporated areas of Imperial County generated approximately 497,169 $MTCO_2e$, with transportation sector being the largest source of emissions at 69 percent of total emissions, followed by energy sector (20 percent), waste (10 percent), and the water sector (2 percent).

Decarbonization of California's Electricity Sector

The electricity sector in California has achieved substantial GHG emissions reductions through renewable and zero-carbon energy deployment. Moving forward, a clean, affordable, and reliable electricity grid will serve as a backbone to support decarbonization efforts, those that reduce or eliminate greenhouse gas emissions, across California's economy. Decarbonizing the electricity sector is a crucial pillar of achieving carbon neutrality, and CARB anticipates that the role of electricity in powering the economy will continue to grow while electric loads increase (CARB 2022).

California continues to add zero-carbon energy resources to replace fossil-fuel generation and support growing demand. Moving to zero-carbon resources is critical to reducing GHG emissions and addressing the long-term impacts of climate change (CEC 2022). Renewable and zero-carbon sources of energy do not operate on-demand like traditional fossil fuel power plants. The growth of zero-carbon resources, especially solar resources, has shifted the reliability concerns from the peak hour (hour with the highest energy demand) to net peak hours (hours when energy demand minus wind and solar generation is largest). As solar capacity has grown in recent years, net peak has shifted to later in the day. Wind generation late in the day aids in meeting the shift to a later net peak (CEC 2022).

Peak demand times require dispatching generation plants with different fuels, and generation resources in the state are diverse. Wind and solar generation are part of the supply on most days. While the electricity sector is using less fossil fuel due to increasing amounts of renewables, existing fossil-fuel natural gas-fired generation will continue to play a critical role in grid reliability until other clean, dispatchable alternatives can be deployed at scale. Presently, fossil-fuel natural gas-fired power plants provide about 75 percent of the flexible capacity for grid reliability. As more renewable power enters the system, other resources such as storage and demand-side management are essential to maintain reliability with high concentrations of renewables (CARB 2022).

Regulatory

Federal

U.S. EPA GHG Mandatory Reporting Program (40 CFR Part 98). This rule requires mandatory reporting of GHG emissions for industrial facilities and power plants that emit more than 25,000 $MTCO_2e$ per year. The reporting program (40 CFR Part 98.300, Subpart DD) applies to electric and transmission distribution equipment that use high GWP gases, including SF_6, for insulation of electrical equipment. Currently, there are no federal regulations limiting GHG emissions from the types of sources that would occur with the proposed project. Circuit breakers and gas insulated switches related to electric power transmission and distribution may be sources of GHG subject to reporting due to the leakage of SF_6.

State

California Global Warming Solutions Act of 2006. In 2006, the state Legislature passed the California Global Warming Solutions Act of 2006 (Assembly Bill 32, Núñez, Chapter 488, Statutes of 2006), codified as Health and Safety Code, section 38500 and the following, which provided the initial framework for regulating GHG emissions in California. This law required CARB to design and implement GHG emissions limits, regulations, and other measures such that statewide GHG emissions are reduced in a technologically feasible and cost-effective manner to 1990 levels by 2020. AB 32 also required CARB to implement a mandatory GHG emissions reporting program for major sources, which includes electricity generators, industrial facilities, fuel suppliers, and electricity importers.

CARB Scoping Plan. Part of the Legislature's direction to CARB under AB 32 was to develop a scoping plan that serves as a statewide planning document to coordinate the main strategies California will use to reduce GHG emissions that cause climate change. CARB approved the AB 32 Climate Change Scoping Plan (Scoping Plan) in 2008 and released updates in 2014, 2017, and 2022. The CARB's Scoping Plan includes a range of GHG emissions reduction actions, which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based compliance mechanisms, such as the cap-and-trade program. In December 2007, CARB set the statewide 2020 emissions limit, defined as reducing emissions to 1990 levels, at 427 $MMTCO_2e$. The 2014 Scoping Plan adjusted the 1990 emissions estimate and the statewide 2020 emissions limit goal to 431 $MMTCO_2e$ (CARB 2014). The 2017 Scoping Plan (CARB 2017a) demonstrates the approach necessary to achieve California's 2030 target, which is to reduce GHG emissions 40 percent below 1990 levels to 260 $MMTCO_2e$. On November 16, 2022, CARB published the 2022 Scoping Plan for Achieving Carbon Neutrality (CARB 2022), which lays out a path to achieve targets for carbon neutrality by 2045.

Mandatory Reporting of Greenhouse Gas Emissions (MRR). AB 32 also required CARB to adopt regulations to require the reporting and verification of statewide

greenhouse gas emissions (Health and Safety Code, section 38530). CARB's Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (Cal. Code Regs., tit. 17 §§95100 to 95163), which took effect January 2009, requires annual GHG emissions reporting from electric power entities, fuel suppliers, CO_2 suppliers, petroleum and natural gas system operators, and industrial facilities that emit at least 10,000 $MTCO_2e$ per year from stationary combustion and/or process sources. Operators of geothermal generating units must also report when total facility emissions of CO_2 and CH_4 equal or exceed 10,000 $MTCO_2e$, which applies to this project.

Cap-and-Trade Program. CARB's cap-and-trade program (Health and Saf. Code, § 38562; 17 Cal. Code Regs., §§95801 to 96022) took effect January 1, 2012. The cap-and-trade program establishes a declining limit on major sources of GHG emissions by sector throughout California, and it creates economic incentives for sources to invest in cleaner, more efficient technologies. The current version of the regulation, effective April 2019, established the increasingly stringent compliance obligations for years 2021 to 2030. The cap-and-trade program applies to covered entities that fall within certain source categories, including first deliverers of electricity (such as fossil fuel power plants) and electrical distribution utilities. Emissions from geothermal generating units and geothermal facilities, including geothermal geyser steam or fluids count toward applicable reporting thresholds, as applicable in MRR, but do not count toward a covered entity's compliance obligation.

Executive Order B-30-15. On April 29, 2015, former Governor Brown issued Executive Order B-30-15, directing state agencies to implement measures to reduce GHG emissions 40 percent below their 1990 levels by 2030 and to make it possible to achieve the previously stated goal of an 80 percent GHG emissions reduction below 1990 GHG emissions by 2050 (CARB 2017a).

Statewide 2030 GHG Emissions Limit. On September 8, 2016, Senate Bill (SB) 32, codified as Health and Safety Code, section 38566, extended California's commitment to reduce GHG emissions by requiring the state to reduce statewide GHG emissions by 40 percent below 1990 levels by 2030 (CARB 2017a).

Renewable Energy Programs. In 2002, California initially established the Renewables Portfolio Standard (RPS) with the goal of increasing the percentage of renewable energy in the state's electricity mix to 20 percent by 2017. State energy agencies recommended accelerating that goal, and former Governor Schwarzenegger's Executive Order S-14-08 (November 2008) required California utilities to reach the 33 percent renewable electricity goal by 2020, consistent with the CARB's 2008 Scoping Plan. In April 2011, Senate Bill X1-2 (Simitian, Chapter 1, Statutes of 2011) of the First Extraordinary Session was signed into law. SB X1-2 expressly applied the 33 percent RPS by December 31, 2020, to all retail sellers of electricity and established renewable energy standards for interim years prior to 2020.

- **Clean Energy and Pollution Reduction Act (Senate Bill 350, De León, Chapter 547, Statutes of 2015):** Beginning in 2016, SB 350 took effect declaring it the intent of the Legislature to acknowledge Governor Brown's clean energy, clean air and greenhouse gas emissions reduction goals for 2030 and beyond. SB 350 increases California's renewable electricity procurement goal from 33 percent by 2020 to 50 percent by 2030.
- **The 100 Percent Clean Energy Act of 2018 (Senate Bill 100, De León, Chapter 312, Statutes of 2018):** Beginning in 2019, the RPS deadlines advanced to 50 percent renewable resources by December 31, 2026, and 60 percent by December 31, 2030. In addition, SB 100 establishes policy that renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity by December 31, 2045.
- **Clean Energy, Jobs, and Affordability Act of 2022 (Senate Bill 1020, Laird, Chapter 361, Statutes of 2022):** Accelerates the timelines set forth in SB 100 to provide that eligible renewable energy resources and zero-carbon resources supply 90 percent of all retail sales of electricity to California end-use customers by December 31, 2035, 95 percent of all retail sales of electricity to California end-use customers by December 31, 2040, 100 percent of all retail sales of electricity to California end-use customers by December 31, 2045, and 100 percent of electricity procured to serve all state agencies by December 31, 2035, as specified.

Short-Lived Climate Pollutant Strategy. To best support the reduction of GHG emissions consistent with AB 32, CARB released the Short-Lived Climate Pollutant (SLCP) Strategy, under Health and Safety Code, section 39730, in March 2017. Health and Safety Code, section 39730, defined SLCPs as having lifetimes in the atmosphere ranging from "a few days to a few decades." Then beginning in 2017 under Health and Safety Code, section 39730.5, CARB was directed to set targets to reduce SLCP emissions 40 percent below 2013 levels by 2030 for CH_4 and HFCs and 50 percent below 2013 levels by 2030 for anthropogenic black carbon (CARB 2017b). The SLCP Strategy was integrated into the 2017 update to CARB's Scoping Plan.

Executive Order B-55-18. On September 10, 2018, the same day he signed SB 100 into law, former Governor Brown issued Executive Order B-55-18 to achieve carbon neutrality, stating the governor's intention "to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter. This goal is in addition to the existing statewide targets of reducing greenhouse gas emissions." From the 2020 GHG limit of 431 $MMTCO_2e$, California will need to reduce statewide emissions another 170 million tons to meet its 2030 statutory target of 260 million tons per year (40 percent below 1990 levels). The state would need to cut annual emissions by a further 175 million tons to meet its 2050 goal (set by executive order) of 85 million tons per year (80 percent below 1990 levels).

Reducing SF_6 Emissions from Gas Insulated Switchgear. In early 2011, CARB adopted a regulation (17 CCR §§95350 to 95359) to reduce SF_6 emissions in gas insulated

switchgear used in the electricity sector's transmission and distribution system as an early action measure pursuant to AB 32. SF_6 is an extremely powerful and long-lived GHG. The 100-year GWP of SF_6 is 22,800 (from IPCC Fourth Assessment Report), making it the most potent of the six main GHGs, according to the U.S. EPA. Because of its extremely high GWP, small reductions in SF_6 emissions can have a large impact on reducing GHG emissions, which are the main drivers of climate change. The regulation requires gas insulated switchgear owners to report SF_6 emissions annually and requires reducing losses of SF_6 over time, subject to annual emission rate limits. The maximum allowable emission rate started at 10 percent in 2011 and has decreased one percent per year since then. The limit reached one percent in 2020 and remained at that level going forward. However, data show that statewide SF_6 capacity is growing by one to five percent per year, which would increase the expected SF_6 emissions. In response to emerging technologies using lower or zero GWP insulators, CARB amended the regulation (Cal. Code Regs., tit. 17, §§ 95350-95359.1) in 2021, which became effective on January 1, 2022, to further reduce GHG emissions from gas-insulated equipment (GIE). Key provisions of the amended regulation include a phase-out schedule in stages between 2025 and 2033 for new SF_6 GIE, coverage of other GHG beyond SF_6 used in GIE, and other changes that enhance accuracy of emissions accounting and reporting.

The California Climate Crisis Act (Assembly Bill 1279). Assembly Bill 1279 (Muratsuchi, Chapter 337, Statutes of 2022) establishes the policy of the state to achieve carbon neutrality as soon as possible, but no later than 2045; to maintain net negative GHG emissions thereafter; and to ensure that by 2045 statewide anthropogenic GHG emissions are reduced at least 85 percent below 1990 levels. The bill requires CARB to ensure that Scoping Plan updates identify and recommend measures to achieve carbon neutrality, and to identify and implement policies and strategies that enable CO_2 removal solutions and carbon capture, utilization, and storage (CCUS) technologies. The CARB 2022 Scoping Plan for Achieving Carbon Neutrality plans for the 2045 target set forth by AB 1279 and Executive Order B-55-18.

California Environmental Quality Act (CEQA) Guidelines for GHG Emissions. With the enactment of Senate Bill 97 (Dutton, Chapter 185, Statutes of 2007), the Governor's Office of Planning and Research was required by July 1, 2009, to prepare, develop, and transmit to the Natural Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. Those amendments to the CEQA guidelines became effective March 18, 2010, and were subsequently updated in December 2018 to further address the analysis of GHG emissions, including the following:

- Lead agencies must analyze the GHG emissions of proposed projects. (See CEQA Guidelines, § 15064.4, subd. (a))
- The focus of the lead agency's analysis should be on the project's effect on climate change, rather than simply focusing on the quantity of emissions and how that quantity of emissions compares to statewide or global emissions. (See CEQA Guidelines, § 15064.4, subd. (b))

- The impacts analysis of GHG emissions is global in nature and thus should be considered in a broader context. A project's incremental contribution may be cumulatively considerable even if it appears relatively small compared to statewide, national, or global emissions. (See CEQA Guidelines, § 15064.4, subd. (b))
- Lead agencies should consider a timeframe for the analysis that is appropriate for the project. (See CEQA Guidelines, § 15064.4, subd. (b))
- A lead agency's analysis must reasonably reflect evolving scientific knowledge and state regulatory schemes. (See CEQA Guidelines, § 15064.4, subd. (b).)
- Lead agencies may rely on an adopted statewide, regional, or local plan in evaluating a project's GHG emissions. (See CEQA Guidelines, § 15064.4, subd. (b)(3))
- Lead agencies may analyze and mitigate the significant impact of GHG emissions as part of a larger plan for the reduction of greenhouse gases. (See CEQA Guidelines, §15183.5, sub. (a))
- A project's incremental contribution to a cumulative GHG emissions effect may be determined not to be significant and the effects of the project to not be cumulatively considerable if the project complies with the requirements of the GHG emissions reduction strategy. (See CEQA Guidelines, §§ 15064, sub. (h)(3); 15130, sub. (d); 15183, sub. (b))

In determining the significance of a project's impacts, the lead agency may consider a project's consistency with the state's long-term climate goals or strategies, provided that substantial evidence supports the agency's analysis of how those goals or strategies address the project's incremental contribution to climate change and its conclusion that the project's incremental contribution is consistent with those plans, goals, or strategies. (See CEQA Guidelines, § 15064.4, subd. (b)(3)). The lead agency has discretion to select the model or methodology it considers most appropriate to enable decision makers to intelligently account for the project's incremental contribution to climate change. (See CEQA Guidelines, § 15064.4, subd. (c).)

Local

Imperial County Regional Climate Action Plan. In 2021, Imperial County published the Imperial County Regional Climate Action Plan. This regional climate action plan helps establish goals for sustainability and GHG reductions across Imperial County to meet the goals established at the state level in AB 32, SB 32, and Executive Orders B-30-15. To meet these targets, the plan calls for multiple sectors to implement reduction measures such as carpool, increased efficiency of new building construction, and the encouragement to procure energy from geothermal sources. The proposed project will serve to directly support this Regional Climate Action Plan by providing another source of geothermal electricity for use in the region (Ascent 2021).

Cumulative

- The State CEQA Guidelines indicate that the impact analysis for GHG emissions is global in nature, and the focus of the lead agency's analysis should be on the project's effect on climate change, rather than simply focusing on the quantity of emissions and how that quantity of emissions compares to statewide or global emissions. The discussion of Existing Conditions (Section 5.3.1.1) discloses the broader context of global climate change and provides information on statewide and local emissions.
- The Cumulative Project Scenario and a list of cumulative projects appears in Section 1 Executive Summary, Table 1-1. Past, present, and reasonably foreseeable probable future GHG emissions could be attributable to each of the cumulative projects, especially those that involve construction activities or O&M activities that involve use of fossil fuels. Each of the projects in the cumulative project scenario could result in some level of contribution to global climate change, although the contribution of GHG emissions from each project would be minimized if the project is designed and built to be consistent with California's overall GHG reduction strategy, as described in the regulatory setting (Section 5.3.1.2).

5.3.2 Environmental Impacts

CLIMATE CHANGE AND GREENHOUSE GAS EMISSIONS Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
2. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, greenhouse gas emissions.

5.3.2.1 Methodology and Thresholds of Significance

In addition to the above environmental checklist, staff used the following methodology and thresholds of significance to evaluate the project.

Methodology

The applicant estimated GHG emissions for construction and operation using emission factors from the most recent CalEEMod User's Guide (ICF 2022) for construction equipment, CARB's EMFAC2021 model for on-road vehicles, and other spreadsheet tools. The estimates include GHG emissions, based on the proposed project staffing schedule of two 10-hour shifts per day and a seven days-per-week work week, from the

construction equipment, vendor and hauling truck trips, and worker vehicle trips. Staff examined the accuracy of the applicant's provided spreadsheets for GHG emissions from onsite and offsite mobile sources and construction equipment.

Thresholds of Significance

The proposed project would be a renewable energy project, designed to generate electricity exclusively from renewable resources. Because the proposed project would install a new geothermal resource production facility and a power generation facility, CEC staff would consider any net additional emissions of GHG to potentially have a significant impact on the environment. This means if the project does not result in any net additional emission of GHG, including GHG emissions from employee transportation, then staff would consider the project GHG emissions to cause no significant impact on the environment.

5.3.2.2 Direct and Indirect Impacts

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

Construction

Less Than Significant Impact. Construction of the project would result in GHG emissions generated by the on-site operation of construction equipment, vendor and hauling truck trips, and worker trips. Off-site construction GHG emissions would include construction equipment for the drilling and construction of offsite wells, and mobile source emissions from off-site vendor, hauling truck, and worker trips. The applicant estimated that the maximum annual GHG emissions from these sources would be approximately 19,106 $MTCO_2e$ during 29 months of construction, including demolition, site preparation, grading, and on-and-off-site construction. The applicant also stated that total project construction emissions would be approximately 30,029 $MTCO_2e$ over the span of the construction period, which would lead to amortized annual GHG emissions of 1,001 $MTCO_2e$ per year (assuming a 30 year project lifespan; Jacobs 2023pp). Given the large scale and long term construction period of the project, amortization of the project's construction emissions was performed and added to the facility's operational GHG emissions, as consistent with Appendix B of CARB's 2022 Scoping Plan (CARB 2022). These emissions are considered short term because construction emissions would cease once construction is complete. Additionally, these emissions are considered necessary to support the State's goals of increasing renewable power production and reducing GHG emissions, through the project's displacement of conventional natural gas generators with renewable geothermal generation. The project's GHG emissions during construction are therefore expected to have a less than significant impact on the environment.

Construction GHG emissions for the offsite switching station, offsite piping, laydown yards, and temporary worker housing were not included in the applicant's emissions calculations, however, given the shorter duration of construction than the facility

construction term and lower amount of associated construction equipment, impacts from the construction of the additional project components are expected to be lower than those of the analyzed project construction emissions. Impacts from construction of the additional project components are therefore expected to be less than significant.

Operation

Less Than Significant Impact. GHG emissions from project operation would be primarily from the cooling tower and sparger system, which are based on two input streams: the non-condensable gas (NCG) condensate/liquid within the cooling towers and the gaseous NCG vented into the cooling towers from the Power Generation Facility (PGF) steam. Other GHG emission sources include the diesel emergency generators and the fire water pump, O&M equipment and vehicles. GHG emissions may include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and sulfur hexafluoride (SF_6), which are reported as carbon dioxide equivalent (CO_2e) emissions.

Table 5.3-1 shows the facility-wide annual GHG emissions for construction and operation, with specific source details provided in Section 5.1.

TABLE 5.3-1 FACILITY-WIDE ANNUAL GREENHOUSE GAS EMISSIONS

	Maximum Annual Emissions ($MTCO_2e$/yr)
Cooling Tower and Sparger	64,394
Fire Pump	3
Emergency Generator	337
O&M Equipment and Vehicles	1,470
Total Operation	**66,204**
Construction emissions	30,029 (Duration of Construction)
One-time Construction, if amortized over 30-year project life[a]	1001
Combined Effects of Operation and Construction	**67,205**
Emissions Avoided by Producing Electricity via geothermal resource	-457,000
Total Net Emissions	-389,795

[a]Total project construction GHG emissions of 30,029 $MTCO_2e$ per year (Jacobs 2023pp)
Source: Jacobs 2023hh and independent staff analysis.

Emissions Avoided by Producing Electricity. Some of the renewable power generated by the proposed project would displace power produced by carbon-based fuels that would otherwise be used to meet electricity demand. The power displaced is incremental power provided by generators elsewhere on the grid, typically from natural gas power plants.

The proposed project, with a gross capacity of up to 157 MW, would be able to produce up to 1,226,400 megawatt-hours (MWh) of electricity each year. Some of the electricity produced would displace fuel-burning by California's flexible natural gas-fired resources or electricity otherwise imported to California. This would avoid GHG that could otherwise be emitted by fuel-burning generators. The rate of GHG emissions avoided would vary

with the mix of generators and imported electricity displaced by the incremental supply generated by the proposed project. The least efficient and highest-emitting generators are normally turned down to accommodate additional renewable generation; in California, there is a single dominant dispatchable fuel (natural gas) (CEC 2019; CPUC 2022).

To estimate the emissions avoided by electricity produced by the project, this analysis assumes that the proposed electricity generating facility would avoid the need to use fuel at a mix of flexible, dispatchable generating facilities. Because natural gas provides most of the flexible capacity, this analysis uses an avoided emissions displacement factor of approximately 0.373 MT of CO_2 per MWh (822.5 lb per MWh), which is a conservatively low emission factor for efficient, conventional generation using natural gas, combined cycle generators (CEC 2019). While the precise quantity of GHG emissions avoided by the proposed project would depend on the operations, the project would result in the avoidance of over 457,000 $MTCO_2e$ per year (0.373 $MTCO_2e$/MWh x 1,226,400 MWh/yr).

Overall Direct and Indirect GHG Emissions Effects. The summary of **Table 5.3-1** demonstrates that the proposed project would not result in any net additional GHG emissions. The combined direct and indirect effects of the emissions quantified indicate that a net GHG reduction would occur primarily due to the emissions avoided by producing electricity from renewable energy. This impact would be less than significant, and no mitigation is required.

b. Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Construction

Less Than Significant. The project's short-term construction GHG emissions would not interfere with the state's ability to achieve long-term GHG emissions reduction goals. Construction vehicles and the supplies of transportation fuels used during construction of the project are required to comply with the applicable GHG reduction programs for mobile sources and suppliers of transportation fuels. Construction activities of the project would conform to relevant programs and recommended actions detailed in CARB's Scoping Plan.

Operation

Less Than Significant. The primary effect of the proposed project on GHG emissions would be the ability to produce electricity from renewable resources, which improves the supply of renewable energy to end-use customers and facilitates achieving statewide renewable energy goals. Electricity from the geothermal energy generation facility would be used to serve the needs of California's customers and would facilitate compliance with California's Renewables Portfolio Standard (RPS).

Other project GHG emissions due to operational activities would be subject to energy efficiency requirements and GHG reduction programs for mobile sources and suppliers of

transportation fuels. For example, emissions from the operational workforce and from O&M activity and building use would be similar to those of other industrial development. The proposed project would comply with all applicable city and state green building standards measures, including California Code of Regulations, Title 24, Part 6, baseline standard requirements for energy efficiency, based on the 2019 Energy Efficiency Standards requirements, and the 2019 California Green Building Standards Code, commonly referred to as CALGreen (California Code of Regulations, Title 24, Part 11).

Achieving the renewable energy targets mandated by the RPS is critical to California achieving its GHG targets and statewide carbon neutrality as established by the California Climate Crisis Act of 2022 (AB 1279). The CARB 2022 Climate Change Scoping Plan identifies decarbonizing the electricity sector as a crucial pillar of achieving carbon neutrality (CARB 2022). The California Global Warming Solutions Act of 2006 (AB 32) and Senate Bill 32 (SB 32) of 2016 codified the GHG emissions target to 40 percent below the 1990 level by 2030. Subsequently, California's Clean Energy and Pollution Reduction Act of 2015 [Senate Bill 350 (SB 350)], SB 350 set ambitious 2030 targets for energy efficiency and renewable electricity, among other actions aimed at reducing GHG emissions across the energy and transportation sectors. SB 350 also connects long-term planning for electricity needs with the state's climate targets, with ARB establishing 2030 GHG emissions targets for the electricity sector in general (CARB 2022). The current RPS was signed into law in September 2018 with Senate Bill 100 (SB 100), which established the goals of 50 percent renewable energy resources by 2026 and 60 percent renewable energy resources by 2030. SB 100 also sets a target for California to achieve a GHG-free energy supply by December 31, 2045.

The strategy for achieving the GHG reductions is set forth by the CARB's Scoping Plan. Overall, the electricity produced by the project would contribute to continuing GHG reductions in California's power supply. Because the project would use renewable energy resources to produce electricity, the avoided GHG emissions would be consistent with and would not conflict with the California's GHG emissions reduction targets and the CARB's Scoping Plan that relies on achieving the RPS targets.

The GHG emissions quantification illustrates that emissions generated during construction and O&M would be considerably less than the quantity of avoided GHG emissions, and that the proposed project would lead to a net reduction in GHG emissions across the State's electricity system. The proposed project would contribute to meeting the State's GHG reduction goals under AB 32, and subsequent targets for 2030 and beyond, and would facilitate compliance with California's RPS. The proposed project would comply with all regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions, and the proposed project would not conflict with any applicable GHG management plan, policy, or regulation. This impact would be less than significant, and no mitigation is required.

5.3.2.3 Cumulative Impacts

The impact analysis for GHG emissions is global in nature, and the project's GHG emissions are considered in the broad context of global climate change. The focus of this analysis is to disclose the project's effect on climate change, while presenting the quantity of GHG emissions. The State CEQA Guidelines provide that a project's incremental contribution to a cumulative GHG emissions effect may be determined not to be significant and the effects of the project to not be cumulatively considerable if the project complies with the requirements of the state's long-term climate goals or strategies.

The proposed project would lead to a net reduction in GHG emissions across the State's electricity system, and the GHG emissions related to the project would not conflict with any plans, policies, or regulations adopted for the purpose of reducing the emissions of GHGs. Therefore, the project's GHG emissions would not be cumulatively considerable.

5.3.3 Project Conformance with Applicable LORS

Table 5.3-2 includes staff's determination of conformance with applicable local, state, and federal LORS. As shown in this table, CEC staff concludes that the proposed project would be consistent with all applicable LORS.

TABLE 5.3-2 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis for Determination
Federal	
Mandatory Reporting (40 CFR Part 98)	**Yes.** Project would emit more than 25,000 $MTCO_2e$ per year and would be required to report GHG emissions consistent with 40 CFR Part 98.
State	
Scoping Plan	**Yes.** The proposed project would provide electricity to facilitate compliance with California's RPS and would lead to a net reduction in GHG emissions across the State's electricity system.
CARB Mandatory Reporting	**Yes.** Geothermal generating units must report when total facility emissions of CO_2 and CH_4 equal or exceed 10,000 $MTCO_2e$,
CARB Cap-and-Trade Program	**Not applicable.** Emissions from geothermal generating units and geothermal facilities, including geothermal geyser steam or fluids count toward applicable reporting thresholds, as applicable in MRR, but do not count toward a covered entity's compliance obligation.
CARB SF_6 Reduction Requirements	**Yes.** The proposed project would comply with GHG emissions reduction requirements through conformance with reporting and phase-out requirements of this regulation.
Local	
Imperial County Regional Climate Action Plan	**Yes.** The proposed project will serve to directly support this Regional Climate Action Plan by providing another source of geothermal electricity for use in the region.

5.3.4 Conclusions and Recommendations

As discussed above, the project would have a less than significant impact related to greenhouse gas emissions and would conform with applicable LORS.

5.3.5 Proposed Conditions of Certification

There are no proposed conditions of certification for climate change and GHG emissions, nor proposed mitigation measures for the non-certificated portions of the project.

5.3.6 References

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5.4 Cultural and Tribal Cultural Resources

Cameron Travis, Patrick Riordan, and Gabriel Roark

This staff assessment of cultural and tribal cultural resources identifies the potential impacts of the proposed Morton Bay Geothermal Project (MBGP) on cultural resources. Cultural resources are defined under state law as buildings, sites, structures, objects, areas, places, records, manuscripts, and historic districts (Cal. Code Regs., tit. 14, §§ 4852a, 5064.5(a)(3); Pub. Resources Code, §§ 5020.1(h, j), 5024.1[e][2, 4]). The California Energy Commission (CEC) staff considered four broad classes of cultural resources in this PSA: Native American archaeological, ethnographic, historic-period, and tribal cultural resources.

Native American archaeological resources are those materials relating to prehistoric human occupation and use of an area. These resources may include sites and deposits, structures, artifacts, rock art, trails, and other5 traces of Native American human behavior. In California, exclusive Native American occupation began over 12,000 years ago and extended through the eighteenth century until 1769, when the first Europeans colonized California.

Ethnographic resources are those materials important to the heritage of a particular ethnic or cultural group, such as Native Americans or African, European, or Asian immigrants. They may include tribal cultural resources (as defined under Pub. Resources Code, § 21074 (a)), traditional resource collecting areas, ceremonial sites, topographic features, value-imbued landscapes, cemeteries, shrines, or ethnic neighborhoods and structures. Ethnographic resources are variations of natural resources and standard cultural resource types. They are subsistence and ceremonial locales and sites, structures, objects, and rural and urban landscapes assigned cultural significance by traditional users. The decision to call resources "ethnographic" depends on whether associated peoples perceive them as traditionally meaningful to their identity as a group and the survival of their lifeways.

Historic-period resources are those materials, archaeological and architectural, usually associated with Euro-American exploration and settlement of an area and the beginning of a written historical record. They may include archaeological deposits, sites, structures, traveled corridors, artifacts, or other evidence of human activity. Under federal and state requirements, historical cultural resources must be 50 years or older to be considered of potential historic importance (a resource less than 50 years of age may be historically important if the resource is of exceptional importance).

Tribal cultural resources are a category of historical resources introduced into the California Environmental Quality Act (CEQA) by Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014). Tribal cultural resources are resources that are any of the following: sites, features, places, cultural landscapes, sacred places, or objects that are included in or determined eligible to the California Register of Historical Resources or are included

on a local register of historical resources as defined in Public Resources Code, section 5020.1(k). Tribal cultural resources can be archaeological, ethnographic, or historic.

The Office of Historic Preservation (OHP 1995, page 2) endorses recording and evaluating resources 45 years or older to accommodate a five-year lag in the planning process.

For the proposed MBGP, staff provides an overview of the environmental setting and history of the project vicinity, an inventory of the cultural and tribal cultural resources identified in the project vicinity, and an analysis of the potential impacts from the proposed MBGP using criteria from CEQA.

If cultural or tribal cultural resources are identified, staff determines whether there may be a project-related impact to them. If the cultural or tribal cultural resources cannot be avoided, staff evaluates whether any of the impacted resources qualifies as a historical resource, unique archaeological resource, or tribal cultural resource as defined by CEQA (Cal. Code Regs., tit. 14, § 15064.5(a); Pub. Resources Code, §§ 21074, 21074(a) 21083.2(g)). If impacted resources qualify as historical resources or unique archaeological resources, staff recommends mitigation measures that ensure that impacts to the identified cultural resources are reduced to a less-than-significant level.

5.4.1 Environmental Setting

Information provided regarding the setting of the proposed MBGP places it in its geographical and geological contexts. Additionally, the archaeological, ethnographic, and historical backgrounds provide the contexts for the evaluation of the historical significance of cultural and tribal cultural resources identified within the project area of analysis (PAA).

Natural Setting

Identifying the kinds and distribution of resources necessary to sustain human life in an environment, and the changes in that environment over time is central to understanding whether and how an area was used in times past. During the time that humans have lived in California, the region in which the MBGP would be located has undergone several climatic shifts (**Table 5.4-1**). These shifts have resulted in variable availability of vital resources, and that variability has influenced the scope and scale of human use of the project vicinity. Consequently, it is important to consider the historical character of the project vicinity's ancient climate (paleoclimate), and the effects of the paleoclimate on the physical development of the area and its ecology.

TABLE 5.4-1 COLORADO DESERT PALEOENVIRONMENT

Period	Climate	Vegetation in Packrat Middens
18,000–10,000 B.P.	Summers cooler, winters not much cooler than present but with more freezes. Rainfall 40–60% greater than present with winter dominant pattern.	Lowlands: Mojavean scrub with creosote bush, black bush, Joshua tree, and Whipple yucca Uplands: Woodland-scrub ecotone at 787–984 feet. Xeric

TABLE 5.4-1 COLORADO DESERT PALEOENVIRONMENT

Period	Climate	Vegetation in Packrat Middens
		juniper woodland with California juniper, shrub live oak, Joshua tree, Whipple yucca, and Bigelow beargrass from 984–1969 feet. Singleleaf pinyon starts above 1509 feet.
10,000–9000 B.P.	Transitional to present climate with still cooler summers. Rainfall 20–40% greater annually and 70% greater in winter than present.	Lowlands: Desert scrub already established. Mojavean scrub persists at sites closest to Colorado River. California Juniper disappears from the Butler Mountains midden profile. Uplands: Mesic woodland plants and singleleaf pinyon ascend to above 4,314 feet after 11,000 B.P. Xeric juniper-scrub live oak woodland or chaparral continues, although California juniper disappears from the Whipple and Tinajas Altas mountains midden profiles.
9000–4000 B.P.	Winter-dominant rainfall pattern replaced by modern bimodal pattern. Rainfall 20% greater than present. Summer monsoon rains greater than present in uplands and west of the lower Colorado River valley but probably same as present in the lowlands. A dry altithermal may apply only to winter-dominant rainfall areas.	Lowlands: Modern desert scrub with creosote bush, Mormon tea, white bursage, pygmy cedar, ironweed, and catclaw acacia by beginning of period. Uplands: Juniper disappears from the Sonoran Desert at 8900 B.P. when modern transition boundary between the Mojave and Sonoran deserts is established. Desert riparian species found on hot, dry, south-facing slopes unlike modern conditions.
4000 B.P.–Present	Modern climatic regime with high summer temperatures, mild winters, and low precipitation in the lowlands. Periodic wetter and drier intervals evident in the uplands.	Lowlands (<984 feet): Modern creosote scrub. Uplands (984–1969 feet): Modern Sonoran Desert habitat distributions.

Abbreviations: B.P. = years before present (1950)
Source: Laylander et al. 2008, Table 1

The proposed MBGP is in the Colorado Desert physiographic province, Imperial County, California. The Colorado Desert is California's warmest desert and biologically speaking is part of the Sonoran Desert that extends into the greater American Southwest. In addition

to its warmth and dryness, today's Colorado Desert is notable for the twentieth-century Salton Sea and its much older predecessor, ancient Lake Cahuilla. (Schoenherr 1992, page 15.)

Geology

The project vicinity sits in the Salton Trough, a basin extending from San Gorgonio Pass (Riverside County) south to the Colorado River delta in northern Mexico (Schoenherr 1992, page 15). The Salton Trough formed 4–11 million years ago from the gradual northward and westward movement of lands west of the San Andreas Fault, in which the Peninsular Ranges of California and Baja California pulled away from continental North America (Harden 2004, page 392; Schoenherr 1992, page 420). The Salton Trough in the project area rests more than 200 feet below mean sea level.

From the Upper Miocene Epoch (11.63–5.33 million years ago) through the Pleistocene Epoch (ending at 11,700 B.P.), periodic seawater intrusions from the Gulf of California submerged the project vicinity and filled the Salton Trough with nonmarine and marine sediments (Jacobs 2023b, page 14; geologic dates based on Cohen et al. 2023). Colorado River floods over the last 12,000 years inundated the Salton Trough, forming an expansive freshwater lake known as Lake Cahuilla (see "Lake Cahuilla and the Salton Sea" below).

Another notable geologic feature of the project vicinity is the Salton Buttes, a chain of five volcanic domes along the southeastern margin of the Salton Sea. From south to north, the buttes are: Obsidian Butte, Rock Hill, South Red Hill, North Red Hill, and Mullet Island. The buttes are rhyolotic volcanic domes at respective elevations of –136, –233, –125, –135, and –190 feet from mean sea level. Rocks found among the Salton Buttes include pumice, rhyolite, tuffaceous sandstone and siltstone, and obsidian (Harden 2004, page 392; Schmitt et al. 2019, pages 9–10).

Until recently, geologists estimated the age of the Salton Buttes as approximately 5000–10,000 B.P. (see Jacobs 2023a, page 5.4-5). Recent, direct radioisotope dating of geologic samples from the Salton Buttes suggests a much younger age for these volcanic structures. Obsidian Butte contains at least five obsidian outcroppings that formed during a volcanic eruption approximately 2450 B.P. (Schmitt et al. 2019, pages 16–17, Figures 1B and 5.). Obsidian Butte served as the major source of volcanic glass for the Colorado Desert and coastal southern California (Schaefer and Laylander 2007, page 250).

The Red Hill volcanic domes formed at about the same time as Obsidian Butte (about 2450 B.P.) but could be as much as 100 years younger than Obsidian Butte (Schmitt et al. 2019, page 17).

Lake Cahuilla and the Salton Sea

The modern Salton Sea occupies an area previously encompassed by ancient Lake Cahuilla, also known as the Blake Sea and Lake LeConte (Laylander et al. 2008, page 21). By the Pleistocene Epoch, the Colorado River delta's alluvial fan closed off the northern

portion of the Salton Trough from the Gulf of California. The Colorado River's subsequent meanderings periodically drained into the Salton Basin, filling the depression with freshwater and sediment, forming Lake Cahuilla. (Jacobs 2023b, page 14.)

Researchers propose that at least six lakefills of Lake Cahuilla occurred during the Pleistocene Epoch, reaching a surface elevation of 102–171 feet above mean sea level. The lowest, most recent Pleistocene-aged shoreline of Lake Cahuilla has been radiocarbon dated to 26,000 B.P. (Laylander et al. 2008, page 21.)

Native American archaeological sites have been identified in association with Lake Cahuilla lake stands as early as 5000 B.P. The lake environment would have offered freshwater fish (Colorado River species, such as pupfish), aquatic birds, freshwater mollusks, and shoreline vegetation. (Laylander et al. 2008, page 21.)

Lake intervals are associated with two distinct sedimentary layers that are radiocarbon-dated between 2300 and 2285 B.P. Researchers believe that lacustrine events between 2300 and 1250 B.P. did not result in a 40-foot elevation high stand for Lake Cahuilla. (Jacobs 2023b, page 22.)

Researchers have identified five lacustrine intervals during the Late Period (1500–300 B.P.) that included maximum high stands at 40 feet above mean sea level. These intervals are:

- Interval 1: 1250–1010 cal B.P.
- Interval 2: 1010–740 cal B.P.
- Interval 3: 740–580 cal B.P.
- Interval 4: 520–370 cal B.P.
- Interval 5: 330–270 cal B.P. (Jacobs 2023b, page 22.)

Archaeologists have found fifteen rows of fish traps, spaced at former lake stands, on the western side of the Salton Sea. Researchers estimate that California Native Americans built one row of fish traps per year as the lake dried. Over the last 500 years, Lake Cahuilla's surface elevation dropped about 4 feet each year. Some estimates suggest that Lake Cahuilla took approximately 55–60 years to completely dry after streams ceased flowing into the Salton Basin. (Schoenherr 1992, pages 420–421.) Evidence of aboriginal settlement and habitation around the lake's southern shore is unfortunately sparse, where researchers presume that that the effects of the lake's repeated flooding and desiccation were dramatic (Schaefer and Laylander 2007, page 250). Lange and Fulton (2009, page 5) hypothesize that the Colorado River, under current climatic conditions, would have to sustain 20 years of continuous flow into the Salton Basin to refill Lake Cahuilla to a surface elevation of 40 feet above mean sea level.

Between 1840 and 1905, the Colorado River reflooded the Salton Basin, refilling Lake Cahuilla at least seven times (Schoenherr 1992, page 607).

Luomala (1978, page 593) hypothesizes that Lake Cahuilla evaporated or became saline around 500 B.P. (during Interval 4 above). Prior to evaporation or extreme salinity, Lake Cahuilla offered Colorado River-species freshwater fish, aquatic birds, freshwater mollusks, and shoreline plants (Laylander et al. 2008, page 21).

Modern Plants and Animals

This discussion of modern plants and animals focuses on those species that humans might have viewed as culturally or economically important, from early days to present. The reader can find a comprehensive discussion of plant and animal life around the proposed MBGP in Section 5.2, Biological Resources, of this staff assessment.

Prior to agricultural and energy development in the Imperial Valley, the MBGP vicinity was in predominantly alkali sink and saltbush scrub communities (Schoenherr 1992, page 447, Figure 9.18), although riparian and lacustrine vegetation communities were (and are) present as well (Jacobs 2023a, Figures 5.2-3 and 5.2-4).

Plants typical of alkali sink communities include saltbush (*Atriplex* spp.), honey mesquite (*Prosopis glandulosa*), inkweed or desert blite (*Suaeda torreyana*), and iodine bush (*Allenrolfea occidentalis*). Biologists observed all these alkali sink/saltbush scrub-associated plants in the MBGP vicinity, except for inkweed (Jacobs 2023c, Table 5.2A-3).

Riparian corridors like the Alamo River support trees and shrubs, namely honey mesquite (*P. glandulosa*), ironwood (*Olneya tesota*), blue palo verde (*Parkinsonia florida*), smoketree (*Psorothamnus spinosa*), common reed (*Phragmites australis*), southern cattail (*Typha domingensis*) and arrowweed (*Pluchea sericea*). The invasive tamarisk tree (*Tamarix* spp.) and giant reeds (*Arundo donax*) can also be found along watercourses. (Jacobs 2023a, page 5.2-21; Schoenherr 1992, pages 465 and 480.) Biologists observed arrowweed (*P. sericea*), honey mesquite (*P. glandulosa*), blue palo verde (*P. florida*), and salt cedar (*Tamarix aphylla*) in the MBGP vicinity (Jacobs 2023c, Table 5.2A-3).

Agricultural crops in the project vicinity include alfalfa, beets, Bermuda grass, corn, cultivated oats, romaine lettuce, and wheat (Jacobs 2023a, page 5.2-18).

The animals inhabiting the Salton Sink are diverse: mammals, birds, reptiles, invertebrates, and some fish. Birds, including migratory and overwintering species, are especially numerous because the Salton Sea is on the Pacific Flyway. Obsidian Butte, the Alamo River Delta, and other offshore rocks host major feeding and roosting locales for birds like the California brown pelican (*Pelecanus occidentalis californicus*) (Jacobs 2023a, page 5.2-2). The California brown pelican is common to abundant at the Sonny Bono Salton Sea National Wildlife Refuge in fall and winter, foraging on open water and historically establishing nesting colonies on Obsidian Butte, nearby rocky islets, the Alamo River delta, and the eastern side of Morton Bay (Jacobs 2023a, page 5.2-12).

Wildlife that historically occurred in the project vicinity include American badger, desert kit fox, monarch butterfly, desert pupfish, razor-back sucker, Couch's spadefoot, flat-tailed horned lizard, lowland leopard frog, Mojave desert tortoise, Sonoran desert toad,

black skimmer, black-tailed gnatcatcher, California black rail, crissal thrasher, gila woodpecker, gray-headed junco, gull-billed tern, Le Conte's thrasher, merlin, mountain plover, short-eared owl, southwestern willow flycatcher, western snowy plover, yellow warbler, yellow-breasted chat, big free-tailed bat, California leaf-nosed bat, Mexican long-tongued bat, pallid bat, western mastiff bat, and western yellow bat. (Jacobs 2023c, Table 5.2-A2.)

Native American Archaeological Setting

The study of Native American archaeology in the Colorado Desert started nearly 100 years ago. Cultural ties to Baja California, Southern California Coast, Mojave Desert, and Sonoran Desert are evident in Colorado Desert archaeology. Researchers broadly describe Native American archaeology in this part of the state in terms of three periods:

- Early or Paleoindian Period (about 12,000–10,000 B.P.)
- Archaic Period (10,000–1500 B.P.)
- Late Prehistoric Period (1500–300 B.P.) (Gates and Crawford 2010, page 6; Jacobs 2023b, pages 17–23.)

Early or Paleoindian Period (about 12,000–10,000 B.P.)

The Early or Paleoindian Period is poorly attested in the regional archaeological record. To date, archaeologists have recovered few directly datable archaeological materials and a handful of time-diagnostic artifact types dating to 12,000–10,000 B.P. (Gates and Crawford 2010, page 6). Isolated fluted projectile points are the only Early or Paleoindian artifacts identified so far and are limited to a few occurrences in the Colorado Desert and eastern San Diego County mountains, such as a fluted projectile point found in the Yuha Desert, south of the project vicinity (Davis 1980, page 150; Jacobs 2023b, pages 17–18).

Archaic Period (10,000–1500 B.P.)

Archaeologists differentiate the Archaic and Paleoindian periods not only by types of artifacts, but by differences in economy. Whereas the Paleoindian Period arguably emphasized large game-hunting and frequent residential movements, the Archaic Period in the Colorado Desert shows a more varied economy. The recovery of grinding tools from Archaic Period archaeological sites suggests a greater emphasis on gathering and processing seed-producing plants for food than during the Paleoindian Period. (Jacobs 2023b, page 18.)

The earliest recognized archaeological complex in the Salton Sink's Archaic Period is the Lake Mojave Complex, although some researchers prefer to classify it as the San Dieguito Tradition or Complex. Archaeologists assign the Lake Mojave and San Dieguito complexes an age of 10,000 B.P. to 8500–7200 B.P. based on radiocarbon dates and time-sensitive artifact types (Moratto 1984, pages 112–113). Time-sensitive artifact types of the Lake Mojave Complex include crescent-shaped stone tools and stone Lake Mojave projectile points, both of which occur in the Southwest Lake Cahuilla Recessional Shoreline Archeological District across the Salton Sea from the proposed MBGP. Archaeological

research in the Southwest Lake Cahuilla Recessional Shoreline Archeological District (P-13-008314) identified a Lake Mojave projectile point made from San Felipe obsidian, which is an obsidian source 149 miles to the south in Baja California. Archaeological sites CA-IMP-007432 and CA-IMP-007438 each yielded a crescent-shaped artifact made from volcanic stones. Other Early Archaic artifacts found in the Southwest Lake Cahuilla Recessional Shoreline Archeological District include large projectile points in the Pinto and Elko series and a stemmed point made from Obsidian Butte obsidian. (Wahoff 1999, pages 21–22.) Dart-sized projectile points at the Southwest Lake Cahuilla Recessional Shoreline Archeological District occurred singly or in chronologically uncertain contexts (Cleland 1999, page 11). Early Archaic archaeology is also known from the area surrounding the Salton Sea. Archaeological site CA-SDI-007074, in the eastern foothills of the Laguna Mountains (San Diego County), contains buried earth ovens radiocarbon-dated to 9600–8590 B.P. (Jacobs 2023b, page 19.)

Cairn burials in Imperial County, such as the Truckhaven Burial (CA-IMP-000109), might date to the middle Archaic Period, but researchers lack convincing dates for such burials (Moratto 1984, page 404; Wilke 1978, page 444; see also Hester 1997, pages 336–337).

The Late Archaic Period (4000–1500 B.P.) has limited evidence in the western Colorado Desert. Given that the northern Coachella Valley and MBGP project site are connected to ancient Lake Cahuilla, the archaeological record of the northern Coachella Valley might be reproduced in the project vicinity. Archaeologists hypothesize that population densities were low, group sizes "flexible," and settled near seasonally available food resources. In addition to open-air settlements, Late Archaic Period people resided in rock shelters in the canyons of northern Coachella Valley. Game hunting was thought to be "opportunistic." Ground stone tools for plant-processing were common. Terrestrial animal remains from Archaic Period archaeological sites in Coachella Valley are dominated by cottontail rabbits (*Sylvilagus audoboni*) and jackrabbits (*Lepus* spp.), whereas razorback suckers (*Xyrauchen texanus*) are the most common remains of lake animal found. Researchers have not identified any significant changes in animal consumption during the Late Archaic. (Love and Dahdul 2002, pages 72 and 80.)

Late Prehistoric Period (1500–300 B.P.)

Changes upon onset of this period were abrupt compared to the Mid–Late Archaic Period. Along the Colorado River, people expanded their subsistence base and adopted floodplain agriculture. (Jacobs 2023b, page 20.)

Native American archaeology in the Salton Basin was affected by the fluctuations of Lake Cahuilla's surface elevation. When the lake was absent or at low elevation, Native settlement patterns consisted of semi-sedentary villages along major watercourses and surrounding springs. California Indians of the Late Period also occupied mountainous areas in particular seasons to acquire mesquite, acorns, and pine nuts. (Jacobs 2023b, page 20.) Mesquite also grew in the lowland project vicinity during the middle nineteenth century (GLO 1856a).

Researchers refined the Colorado Desert's Late Period chronology, using Malcolm Rogers' ceramic-type chronology as a point of departure. These researchers replaced Rogers' use of the term "Yuman" with "Patayan" and tied the ceramic timeline of the Colorado Desert to fluctuations in the surface elevation of ancient Lake Cahuilla. This refined Late Period chronology includes three archaeological periods: Patayan I–III (1200 B.P. to European colonization). (Jacobs 2023b, pages 20–21.) Schaefer and Laylander (2007, pages 252–253) point out that recent archaeological research has identified discrepancies in the Patayan sequence, suggesting that additional research in the project vicinity might alter archaeologists' understanding of the Patayan Period.

Patayan I (1200–950 B.P.) archaeology marks the arrival of pottery in the Colorado Desert, although it appears limited to the Colorado River environs. Archaeologists regard Patayan I groups as small, mobile settlers that lived along the Colorado River in certain seasons. (Love and Dahdul 2002, page 72.)

Patayan II (950–500 B.P.) began during an infill period of Lake Cahuilla, which eventually covered much of the Imperial Valley. New pottery types are observable at Patayan II sites, associated with local production at the lakeshore and technological changes from the Colorado River area. Numerous lake-fill and recession episodes occurred during Patayan II. (Jacobs 2023b, page 20; Love and Dahdul 2002, pages 72–73.)

Patayan III (500 B.P. to European colonization) occurred during a drying interval at Lake Cahuilla. At this time, Colorado Buff Ware was the most common ceramic ware across the Colorado Desert and at the Colorado River. (Love and Dahdul 2002, page 73.) Several Patayan II ceramic wares remained in use during Patayan III (Cordell 1997, page 212).

Researchers hypothesize that Yuman language-speakers lived in the drainages of the Gila and Colorado rivers, western Arizona, for at least 2,000 years. Yuman people gradually migrated westward into the Colorado River, the Peninsular Ranges, and finally, the San Diego coast. Ceramic technology made its way from the deserts to the mountains and coasts around 1300–1200 B.P., along with small projectile (arrow) points and cremation of the deceased. (Jacobs 2023b, page 21.)

At intervals, access to Obsidian Butte obsidian was underwater when the surface elevation of Lake Cahuilla was higher than approximately –225 feet relative to mean sea level. Obsidian Butte obsidian was widely used in Southern California during the Late Period, especially after 950 B.P. (Jacobs 2023b, page 22–23.)

Ethnographic Setting

The applicant proposes to build and operate the MBGP on land traditionally affiliated with California Indians belonging to three ethnolinguistic groups recognized by anthropologists: the Kamia, Cahuilla, and Quechan.

Kamia

The Kamia, or more correctly the eastern or desert Kumeyaay, spoke a Yuman language. They were closely related to the southern Kumeyaay (Tipai) of the mountains and coastal areas of San Diego County and northern Baja California. Their dialect, however, was also closely related to the language of the Cocopa and other delta Yuman tribes (Russell et al. 2002). They occupied areas along the New and Alamo rivers and at springs and walk-in wells in Imperial Valley. During the ethnohistoric period, the Kamia were politically and militarily allied with the Quechan and Mohave in opposition to the Cocopa and Halchidhoma. They maintained especially good relations with the Quechan and were permitted a farming rancheria at the large Quechan settlement of Xuksil ("sandstone" in Quechan), a few miles south of the modern Mexican town of Algodones and north of the branching of the Alamo River near the southern tip of the Imperial Dunes (Russell et al. 2002, page 84).

Like their Yuman neighbors, the Kamia lived in rectangular, semi-subterranean structures of post-and-beam construction with thatch and earthen roofs. They also built ramadas, lean-tos, and conical sweat houses. They dispersed their dwellings some distance apart, on or adjacent to arable alluvial terraces and as close to running water, hand-dug walk-in wells, or sloughs as possible. There were no permanent villages, and their moves were dependent on the availability of floodwater farming areas and the ripening of wild plants. They would move to higher terraces if flooding occurred. (Luomala 1978, page 597.) Seasonal overflow from the Colorado River that fed the New and Alamo River sloughs periodically failed, and the Kamia would move to other locations, including the Colorado River, during those stressful times.

The Kamia organized into 10 or 11 non-localized exogamous patrilineages. Many Kumeyaay living to the west were also members of these same lineages, leading Gifford (1918; 1931, page 1) to conclude that the Kamia were, in essence, desert Kumeyaay who had assimilated many aspects of river Yuman culture. Lineage identification with specific locations was probably more related to the settlement preferences of individual families who moved as lineage segments than to any lineage's claim to specific lands. Gifford (1931, page 14) suggests that some greater degree of lineage localization may have occurred in the past but was inhibited by the mobility requirements of shifting arable lands. The economic unit was the extended family household consisting of a man and wife (or wives), their children, and the children's grandparents. The Kamia maintained a greater degree of tribal identification than their Kumeyaay relatives to the west, recognizing a tribal chief over all the lineages, a role that served to organize economic activities, warfare, and diplomacy. It is not clear if this position reflects Euro-American wishes to identify a "captain."

The Kamia practiced a mixed economy of horticulture, hunting, and gathering. Mesquite (*Prosopis pubescens*) was the most important wild staple crop, as it was among other groups in the Colorado Desert. Seed pods were ripe in July and were readily collected at Espayau, south of Pilot Knob. Acorns were either obtained directly in the Peninsular Ranges or through trade with the Kumeyaay in exchange for cultigens, especially

watermelons. The Kamia also procured baked and dried agave cakes from the Kumeyaay but otherwise did not participate in the early spring agave harvest. Cattail pollen and roots (*Typha* sp.) were gathered from sloughs, one favorite spot being Seven Wells on the east-west portion of the Alamo River south of the international border. Gifford (1931, page 24) reported on another marsh plant called wāró. The seed capsules were pulled off by hand over a ceramic pot, and the capsules were rubbed until the seeds were freed. The pods were then winnowed away with a ceramic dish. The seeds were ground on a metate and eaten dry. Either wooden mortars or stone metates were used to process many wild seeds, followed by cooking. Gifford's (1931, page 27) consultants apparently had no knowledge of the widespread practice of parching seeds prior to grinding. Among the seed resources were saltbush, yerba mansa (*Anemopsis californica*), and sedge (*Cyperus erythrorhizos*).

The Imperial Dunes also provided several plant foods. These included the black stems of a foot-high plant called yidut, which were boiled in a pot and then peeled (Gifford 1931, page 24). This was most likely the sandroot (*Pholisma sonorae*) that Castetter and Bell (1951, page 209) noted as being called *oy²t* by the Cocopa and which the Cocopa and Quechan were observed collecting as late as 1895. The ball-shaped root of a plant called *nyus* was boiled and eaten. It is very likely that sandroot, discussed above, was also dug out of the sand dunes. Gifford's (1931) list of exploited plants is very slim, and the Kamia likely gathered the same diverse array of plants as did other Colorado River peoples and the Kumeyaay.

The Kamia applied the same fishing methods as the River Yumans, except that they did not use the dip net. Also, as among the River Yumans, hunting was a minor activity, but prey included migratory waterfowl, squirrels, gophers, hares, beaver, deer, and bighorn sheep.

The Kamia applied the same system of floodplain agriculture as the Yumans living on the Colorado River and in its delta (Castetter and Bell 1951). Their fields extended along the lower alluvial terraces of the New and Alamo rivers, at locations shifting with each seasonal flood cycle. As previously mentioned, the Quechan also afforded them arable land on the Colorado River near Algodones and points south and east. Irrigation after planting was not practiced in Imperial Valley, but they did build earthen dams at Xatopet ("dam" in the Kamia language) and elsewhere to channel water into higher-terrace areas to adequately saturate the soil before planting (Gifford 1931, page 22).

Lake Cahuilla figures prominently in the Kamia origin myth (Gifford 1931, pages 75–83), and except for the Cahuilla accounts, this represents the only major recorded oral tradition regarding the ancient lake. The Kamia traced their origins to the north, at Wikami near Needles, as did all River and Delta Yuman groups and the southern Kumeyaay (Tipai). The Mohave settled closest to Avikwame, and all the other groups migrated south to their respective territories. As related to Gifford:

> The Kamia came part way with the Yuma [Quechan], then left them and went to the eastern shore of the Salton Sea. The sea (probably Blake's Sea [Lake Cahuilla]) was

> large then and where El Centro is now there was sea. Later they moved to Indian Wells (Xachupai) and to Saxnuwai (near Holtville). There were ten men of each tribe. The ten Kamia men were the ancestors of ten lineages. Some of the Kamia passed through Imperial Valley into the mountains of San Diego County and became the Diegueño. There they had no seeds to plant, but found wild plant foods, deer, and mountain sheep.
>
> The tribes of Mission Indians were also near the (presumably present) southern end of Salton Sea. They became afraid of the Kamia, hence the Cahuilla and other Shoshonean tribes fled northwestward.
>
> Later there came from the mountain Wikami three persons who were to be the Kamia leaders. They were a hermaphrodite (described by the informant as half man, half woman) call Warharmi (cf. Mohave hwami) and her twin "sons" (not really her sons, Narpai said), both called Madkwahomai…They came south along the Colorado River…
>
> From the Colorado River at Yuma they crossed over to Imperial Valley. Their appearance so frightened the Kamia that they fled in all directions. One Kamia woman did not flee before the three. She was married by one of the Madkwahomai twins. Then the three newcomers and the woman settled at Saxnuwai.
>
> The seeds of maize and beans had been given them by Mastamho. These the three travelers brought from Wikami and planted at Saxnuwai, thus introducing cultivation in the Imperial Valley. Those Diegueño who had gone to the mountains to live failed to receive the seeds. The three travelers brought the seeds of certain wild plants as well.
>
> At Saxnuwai, Warharmi and the twins planted, for they found wet ground there. Before their departure from Wikami Mastamho had explained how everything was to be done. He had said that Warharmi and the two Madkwahomai were to be farmers and that they should go to dwell among the Kamia, whom Mastamho had sent to live on the shores of the Salton Sea. (Gifford 1931, pages 79–80.)

Gifford considered the question of which phase of Lake Cahuilla the Kamia might have been referring to in their mythology. He first weighed the argument that the final recession occurred before 1540 when Alarcón and Díaz reached the lower Colorado River. This was the prevailing view up until the 1980s. He then suggested that there certainly was enough time between Spanish entradas into the area for an additional infilling phase. A seventeenth-century infilling has now been substantiated, as discussed above. Gifford indicated that the high degree of observed acculturation to Quechan culture did not provide a clear index to the length of time the Kamia had been in Imperial Valley and the Colorado River Valley. It could have taken place even in the nineteenth century after a late phase of Lake Cahuilla, he suggested. The occurrence of some western Kumeyaay lineages among the Kamia could also indicate movements into Imperial Valley of people escaping the missions or their influence. However, Gifford did not discount the possibility

that the Kamia population and cultural form may have been well established for a millennium (Gifford 1931, pages 83, 86).

An 1849 census counted 254 Kamia people on the New River in Imperial Valley under Chief Fernando. They included 118 men, 82 women, and 54 children (Gifford 1931, page 16). Presumably their numbers were much greater before the advent of European diseases and probably dropped even more drastically with the rampant smallpox and measles epidemics of the 1860s. A series of prolonged droughts or floodwater failures in the nineteenth century also took their toll on the population and eventually drove most Kamia in Imperial Valley to live at the rancheria of *Xatopet*, possibly on an east-west portion of the Alamo River south of the Imperial Dunes near the village of Huerta, Baja California. This was an emergency planting place that the Quechan also used, as when the Colorado River failed to flood in the summer of 1851 (Kroeber 1980, page 190).

Ethnographic documentation indicates that the Kamia believe that the hearts of individuals who were cremated but did not burn completely would come alive and transform into young owls (Gifford, 1931, page 72). This belief was supported by the testimony of an old Yuma man who claimed to have seen a dead person's heart taking on the appearance of an owl. It was believed that the hearts of bad people were difficult to burn and would become owls, while those of good people burned easily, indicating a good life. If a heart did not burn completely, it would be buried in the pit with the ashes.

Cahuilla

Cahuilla territory is understood to be bound by the summits of the San Bernardino and Chocolate Mountain ranges on the north; the area in the vicinity of Borrego Springs to the south; a portion of the Colorado Desert west of the Orocopia Mountains; and the Colorado River to the east; the San Jacinto plain near Riverside; and the eastern slopes of the Palomar Mountains to the west (Bean 1978, Figure 1). Their territory includes San Gorgonio pass, the lowest entrance to interior California from the Great Basin at only 2600 feet elevation, and dramatically bound to the north by San Gorgonio Mountain (11,503 feet), the highest peak in the San Bernardino Mountains (and all of Southern California), and to the south by Mount San Jacinto (10,834 feet) the tallest peak in the San Jacinto Range, creating one of the deepest and dramatic mountain passes in the United States (Kroeber 1908, page 30). The Coachella Valley gently sloping down to the depths of the Salton Sink, bound to the west by the Santa Rosa Mountains and to the east by the Little San Bernardino Mountains, comprises the geographic center of the Cahuilla area. This territory consists of wide elevation variability, from San Jacinto Peak to the Salton Sink at 273 feet below sea level.

Cahuilla settlements were generally in transitional areas between biological communities in the lower portions of canyons that extend into the mountains; along the banks of bodies of water like Lake Cahuilla; or at higher elevations in mountain valleys (CSRI 1983, page 5-17). Villages were near sources of water and food, in canyons or on alluvial fans, and in areas where there was some protection from the persistent winds (Bean 1978, page 575). Palm oases were choice locations for permanent habitation sites as they

provided abundant water, game, edible plants, and a favorable climate. Sources of surface water attracting settlement, included lakes, streams, springs, marshes, and seeps. In the eastern desert portion of the territory, villages were at the feet of broad alluvial fans where the water table was high enough to allow the Cahuilla to dig shallow wells to access a dependable water supply (Bean 1972, page 74). Village locations were often, though not always, set back from a water source enough that animals would not be afraid to come and drink (CSRI 1983, page 5-17). When water needed to be transported into the village, it could be collected in ollas (ceramic pots) and carried in. Bean and Saubel (1972, page 20) estimate that no village was more than 16 miles from all food gathering areas with its territory and that 80 percent of all food resources could be found within 5 miles around each village.

Villages were occupied year-round; many inhabitants would leave periodically to collect seasonally ripening foods in different environmental zones. Temporary camps would be established in these food collecting areas, and surpluses would be transported back to the main village. Mountain Cahuilla would move to the upper desert areas and established temporary camps to process agave in late winter and early spring, and then move to lower desert areas to harvest mesquite beans in the late spring. Conversely, the Desert Cahuilla ascended the mountains in the fall for the pinion and acorn harvests.

Approximately 12 or more politically autonomous land-holding clans owned territories within the area, with each territory stretching from the desert or floor of the Coachella Valley to higher elevation areas in the mountains, spanning several biotic zones. Bean and Saubel (1972, page 20).

Structures

Several distinct types of structures were constructed and utilized within Cahuilla communities, the ceremonial house (kishumnawut, in recent times referred to as the "big house"); dwellings of various sizes, conical or rectangular in form; and sweathouses.

Bean (2020, pages 166–168) reports that the most important and largest structure in Cahuilla communities was the big house, which would be centrally located near a permanent water source, and usually served both as the home of a clan leader (*net*) and as the ceremonial house for the community. The big house served as the location for political meetings, funerals, curing rituals, rites of passage, as well as recreation.

The structure was 30–50 feet in diameter and large enough to hold more than 100 people. With a rectangular or round footprint, the big house would have vertical walls 4–5 feet in height, domed roofs, and sometimes subterranean floors, and were traditionally constructed of willow, tule, or palm fronds (Modesto and Mount 1980, page 36). A door was at the front of the building and in front of that was a circular enclosure up to 50 feet in diameter that contained a dance and meeting area that was sometimes covered by a ramada (Bean 1972, pages 72–73). Attached to the big house was a special compartment where the sacred bundle (*maiswut*) that held ceremonial regalia, ritual items, and the supernatural power *amana a* were cared for by the net (Bean 2020, page 167; Strong

1929, page 182). Ethnographers report that the sacred bundle, revered as highly sacred and the most important possession of the clan, formed the heart of the ceremonial house (Strong 1929, page 61).

Several Cahuilla housing types are identified in the ethnographic literature. The type most often described by ethnographers is the jacal (*samat* in Cahuilla), which is a rectangular dwelling, twelve by 18 feet or smaller, speculated to have been adopted by the Cahuilla through contact with Europeans or Colorado River tribes and their construction methods. Often two or three jacals were constructed facing each other about a patio or court (*wa-yi-los*) to accommodate an entire family (Barrows 1900, page 37). The patio or court served as the gathering place for a family and was surrounded by a low brush fence to provide a break from the wind. In summer, a square, flat-roofed ramada (*táish-kish-la*) covered with willow (*Salix* spp.) boughs was built over the court creating a pleasant outdoor retreat from the summer sun.

The second housing type described in the literature and presumably the indigenous form of abode among the Cahuilla, was circular or oblong in plan. The house was constructed by setting two or three crotched poles vertically in the floor, with poles spanned and affixed atop the posts with limbs and branches leaned against the modest structural framing (Barrows 1900, page 38). Over the assembled wall and roof framework, grass or tule thatching is then piled, forming a structure like the wickiup constructed by the Apache and Havasupai.

Large, usually rectangular communal houses were occasionally constructed and used by multiple related Cahuilla families. These communal houses usually had one entrance, a single fireplace, and no internal partitions (Drucker 1937, page 12).

Housing materials differed among the Cahuilla based on location and availability of resources. Houses farther into the desert consisted of arrow weed, mesquite, and clay daub (Barrows 1900, page 38; Bean 2020, page xxxiv). The locally gathered plant materials were laid over a framework of branches, and where there was mud, it was spread on a base of brush and poles, creating a strong and tightly constructed shelter.

Caves in canyons also served as dwellings, some having doors and doorways constructed of wood at their entrances (CSRI 1983, page 5-18). Bean (2020, page 180) notes that caves were also used as ceremonial sites, places of hiding from strangers, refuge from inclement weather, camps while hunting and gathering, and for the safe storage of food and important items.

Sweathouses (*hashla* or *hoyachet*) situated next to streams or ponds were common elements within Cahuilla communities. Cahuilla men used the sweathouse as a clubhouse, for sweating for spiritual or health reasons, and for 'smoking' themselves in white sage to disguise their human scent prior to a hunt. Sweathouses were places where men would smoke tobacco, talk, sleep, and educate younger men about their culture (Bean 2020, pages 175–179). They were places where decisions were made and community opinions were formed (Bean 1972, page 73). Sweathouses could hold up to a dozen men. A fire

was built inside causing the attendees to sweat profusely from the intense heat, and after the fire would die down, they would run from the sweathouse and plunge themselves into the cool nearby water and repeat the process throughout the night (Hooper 1920, page 357).

Kroeber (1908, page 64) provides a detailed description of a semi-subterranean sweathouse then in use at the Banning reservation:

> From the outside its appearance is that of a small mound. The ground has been excavated to the depth of a foot or a foot and a half, over a space of about twelve by seven or eight feet. In the center of this area two heavy posts are set up three or four feet apart. These are connected at the top by a log laid in their forks. Upon this log, and in the two forks, are laid some fifty or more logs and sticks of various dimensions, their ends sloping down to the edge of the excavation. It is probable that brush covers these timbers. The whole is thoroughly covered with earth. There is no smoke hole. The entrance is on one of the long sides, directly facing the space between the two center posts and only a few feet from them. The fireplace is between the entrance and the posts. It is just possible to stand upright in the center of the house.

Strong's brief description of a semi-subterranean sweathouse is consistent with Kroeber's observations made 20 years prior, noting the semi-subterranean nature of the structure, its construction, size, height, and position of the fireplace (Strong 1929, page 182). Barrows (1900, page 77) describes a more lightly constructed sweathouse built above ground.

A few smaller ancillary structures commonplace within Cahuilla communities include granaries, wells, and siesta houses. Granaries that could contain several bushels of food were clustered around individual homes and ceremonial houses and stored seeds and other foodstuff such as acorns, mesquite beans, and pine nuts. The large basket granaries were made of arrowweed, willow, or wormwood withes with the leaves left on and twisted into a thick rope the size of a man's arm and coiled into a basket about 30 inches tall and 3–6 feet in width (Barrows 1900, page 52; Bean 1972, page 72; Kroeber 1908, page 42). Owned by individual families, the granaries were placed on platforms high above the ground, on top of houses, or on top of boulders and sealed with mud to keep their contents out of reach of rodents and birds.

Water wells were significant features in many Cahuilla villages and varied in size from minor depressions to walk-in-wells dug into the sand some 30 feet (Bean 1972, page 73). Anthropologists report that wells were dug with shovels fashioned from mesquite wood and the earth removed by baskets. The wells consisted of a sloping trench 50–75 feet long with steps fashioned on the floor and excavated up to 25 feet in depth. At the end of the trench the well was excavated, a circular pit approximately 15 feet in diameter and 25–30 feet deep with sloping sides cut back to prevent the walls from collapsing and filling in the well (Heizer and Treganza 1944, page 303).

Another structure mentioned in the ethnographic literature is an outdoor sleeping platform described as a siesta house which was constructed of poles and shaded with leafy brush making an airy outdoor resting place raised slightly above the ground (CSRI 1983, page 5-19).

Within the Cahuilla worldview, plants are not viewed as inanimate resources to be exploited based upon their potential utility, rather they are recognized as living beings with whom one could communicate and interact (Bean and Saubel 1972, page 15). Plants are seen as life forms—as are rocks, elemental forces, animals, birds, and spirits—that can communicate with those who know how to listen. Within the Cahuilla worldview, lore, and oral literature, plants often take on anthropomorphic roles, considered to be accurate representations of past events and the natural reality that is present and ongoing. Plants and humans are placed on earth by the Creator as part of a dynamic reciprocal system wherein plants served humanity, and in return, people have obligations to plants and the rest of creation. As such, plants, like any other life form are treated with respect, the gatherer mindful of the plant's sacrifice for its predetermined use, is thankful for the plants use and role in the order of the universe.

Accompanying the respect that the Cahuilla have for plants and the relationship people have with them, is a recognition of the debt owed to the plants, which Bean and Saubel (1972, page 16) indicate was expressed in rituals associated with their use. These rituals not only serve to recognize the role of the plant within their world but acknowledges that there is a right conduct associated with the use of any lifeform. Rituals served to instill a sense of stewardship, allowing for regeneration of the lifeform. One of the fundamental obligations of the user was not to overexploit a plant and thereby endanger its survival. To this end, when plants were collected, part of it was usually left behind, it was seldom stripped bare, and some were always left behind in any given patch to allow for future propagation. First-fruit ceremonies were held at the beginning of the gathering seasons of major foods where ritual portions of the crop were eaten to express appreciation to the supernatural powers for providing an abundant harvest, to ensure that any "sickness" that may have been put into the food at Creation was exorcised, and to provide for future bountiful harvests (Bean and Saubel 1972, page 16).

Plant Foods

The assemblage of plant foods within the traditional Cahuilla diet is diverse, the result of having access to different botanical zones to draw upon, their diet was not dependent upon one single staple. The diversity of plant food resources available within their territory created a broad and abundant food base at nearly all times of the year (Barrows 1900, page 69). As noted by Bean (1972, page 36), the diverse habitats accessible to the Cahuilla "produces a floral domain of immense variety, consisting of several thousand species, of which the Cahuilla remember using several hundred for food, manufacture, or medicine. These food plants provided the Cahuilla with a significant portion of their nutritional base. However, to extract the potential from these plants, ingenious methods and precise knowledge of plant ecology were necessary."

The most important plants to the Cahuilla diet were acorns (from a variety of oak, *Quercus* spp.), mesquite (*Prosopis juliflora*) and screw beans (*P. pubescens*), piñon nuts (*Pinus* spp.), and the fruit of several cacti (*Opuntia* spp.), with a variety of seeds, fruits, berries, tubers, roots, and greens augmenting the diet as they were available (Bean 1978, page 578).

Throughout indigenous California the role of the acorn rules supreme in traditional diets, and, as suggested by Bean and Saubel (1972, pages 121–131), the Cahuilla are no exception to the rule despite that the acorn is not as abundant in the Cahuilla homeland. Nonetheless, oak groves could be found within 5–20 miles of most villages and acorns from six varieties of oak have been documented as contributing to Cahuilla diets.

Oak groves were owned by lineages, and individual trees within the grove owned by families belonging to the lineage. The choicest oak groves belonged to the mountain groups, and the least favorable acorn gathering areas belonging to the desert groups. As a result of this inequity in access to quality acorn, it is not surprising then that acorn was not the most important plant food resource among the desert groups (Bean and Saubel 1972, page 124).

Acorns were harvested from October to November. Relying on the labor of most the able-bodied men, women, and children of a village, they moved to the oak groves where they camped for three to four weeks to allow the acorns to be gathered, dried, and processed. (Bean 1972, page 37).

Perhaps equally as important to the Cahuilla diet as the acorn was the fruit of the mesquite (*Prosopis* spp.), of which the Cahuilla utilized the legume of the two varieties available to them: the honey mesquite (*P. juliflora*) and the screwbean (*P. pubescens*) (Barrows 1900, pages 55–56; Bean 1972, pages 38–39; Bean and Saubel 1972, pages 107–118; Hooper 1920, pages 356–357). Thickets of mesquite were found in portions of alluvial fans and canyons, and grew along rivers, streams, sloughs wherever their roots could access the water table. Mesquite and screwbean figured prominently in the diets of the more desert-oriented Cahuilla groups.

Mesquite trees produced edible blossoms in June and large quantities of seed pods in July and August. Like acorn harvests, the gathering of mesquite and screwbean blossoms and beans required the labor of every available man, woman, and child. After their harvest, blossoms could be roasted and then formed into balls or dried in the sun and later placed in water to produce a refreshing beverage. Ethnographers note that there were several preparations for the beans (Barrows 1900, pages 56–57; Bean 1972, page 39): they could be eaten fresh from the tree; mashed in a mortar and mixed with water and drunk; dried and eaten; or ground into a flour and formed into cakes that could be stored and later prepared as a drink, porridge, or eaten dry.

The agave (*Agave deserti*) grew in abundance in the lower foothills and the desert-facing sides of mountains of Cahuilla territory and served as a basic food staple primarily gathered in November and December (Bean and Saubel 1972, page 32). The heads and

stalks of the plant were roasted in earthen pit ovens transforming the otherwise inedible plant into a rich and preservable food resource that could be kept for years under the right storage conditions (Bean 1972, pages 41–42). Each agave could produce several pounds of edible flowers between April and August. The yellow blossoms would be parboiled and dried for storage and boiled again when ready to be eaten (Barrows 1900, page 59; Bean and Saubel 1972, page 32).

Three species of yucca and nolina (*Yucca whipplei*, *Y. schidigera*, and *Nolina parryi*) provided an abundant food source for several months of the year, with flowers, stalks, fruit, and seed pods harvested from the plants (Barrows 1900, page 60; Bean 1972, pages 42–43). Yucca blossoms and the roasted stalks of the plant were often dried for long-term storage and later use. In addition to yucca and agave being important food plants, they were also valuable sources of fiber used to make a wide variety of items including sandals, rope, cordage, nets, women's skirts, and baby cradles (Bean and Saubel 1972, pages 35 and 152).

Many varieties of edible cactus providing food in great quantities are available within the range of the Cahuilla. Two species of barrel cactus (*Echinocactus* spp.) and nine species of prickly pear (*Opuntia* spp.) made up an important part of the traditional Cahuilla diet (Bean 1972, page 40). Where they grew in abundance in large colonies, they were owned by specific lineages. The leaves, stalks, fruit, and seeds of cacti were used as food and typically gathered in the early spring and available for several months of the year. Producing large quantities of edible fruit, a single plant could produce several pounds of food and be exploited several times throughout the season. The young fruit of the cactus was harvested, its spines removed, and cooked or steamed with hot stones in a pit for 12 hours or more before consumed or dried and stored for later use (Barrows 1900, page 67). Some cactus fruit was allowed to go to seed and dried, the seeds were removed and stored for the winter when they were processed into a flour and cooked into a mush.

Numerous seed-producing plants augmented nutritional content, added variety, and served as storage-stable food reserves to bolster the Cahuilla diet, they include: golden yarrow (*Eriophyllum confertiflorum*), pigweed (*Amaranthus palmeri*), Great Basin sagebrush or wormwood *(Artemisia tridentata*), milkweed (*Asclepiiadaceae* spp.), quail bush (*Atriplex lentiformis*), goldfields (*Lasthenia* spp.), downy chest (*Bromus* spp.), palo verde (*Cerecidium floridum*), pin cushion (*Chaenactis glabriuscula*), goosefoot (*Chenopodium fremontii*), wild squash (*Cucurbita foetidissima*), Mormon or miner's tea (*Ephedra nevadensis*), wild buckwheat (*Eriogonum fasciculatum*), sunflower (*Helianthus annuus*), tarweed (*Hemizonia fasciculata*), tidy tips (*Layia glandulosa*), yellow rayed lastheina (*Lasthenia glabrata*), peppergrass (*Lepidium fremontii*), boxthorn (*Lycium andersonii*), desert dandelion (*Malacothrix californica*), devil's claw or unicorn plant (*Proboscidea keller*), burr clover (*Medicago hispida*), blazing star (*Mentzelia gracilenta*), panic grass (*Panicum* spp.), glasswort (*Salicornia subterinalis*), sage seeds (*Salvia* spp., especially *S. columbariae*, chia), bullrush tule (*Scirpus* spp.), goatnut (*Simmondsia chinensis*), tansy mustard (*Descurainia pinnata*), and sea blite or seepweed (*Suaeda* spp.) (Bean 1972, pages 46–47).

The painstaking and time-consuming collection of small seeds, mostly undertaken by women, began in June and continued through September. Bean (1972, page 47) reports that it could take an entire day's labor to collect two quarts of seed. Seeds were typically harvested using a seedbeater to beat seed-laden stalks as they were bent over a basket that caught the dislodged seeds (Bean and Saubel 1972, page 137). Many types of seeds were parched in trays with small bits of hot coals, tossing and shaking them, the seeds were toasted (making them more digestible and tastier), and could then be stored for long periods of time. When needed for use, seeds could be ground into meal from which cakes or mush could be made.

Food Animals and Hunting. Large game, consisting of mule deer (*Odocoileus hemionus*), mountain sheep (*Ovus canadensis*), and pronghorn (*Antilocarpa americana*) were important sources of food and integrally involved in economic, social, and religious facets of Cahuilla society. Their meat was valued both for its taste and the large amount of food that an individual kill could provide (Bean 1972, page 57). Hunting large game was a dangerous activity undertaken only by able men and required specific ritual preparations and adherence to specific rules. To prepare, a hunter may fast, sweat, bathe (in both water and smoke), and meditate. The rituals served to hone the hunter's attention and prepared both the mind and body for the hunt.

Hunting was a valuable skill and required a considerable time investment for stalking, chasing pray, and hiding in blinds to get close enough to hunt with a bow and arrow or to strike the animal with a club. Additionally, hunters drew upon their detailed understanding of each species and their specific behavioral characteristics during the hunt. Hunters carried little with them besides their hunting implements, usually just a pouch of chia seed or jerky (Bean 2022, page 272). The hunter's light kit afforded him the ability to travel efficiently and carry more meat back to the village.

Hunting large game could be done as a group activity or as a solo endeavor. Deer were usually hunted by an individual hunter or a small party of two or three, whereas pronghorn could be hunted by large parties consisting of several dozen men (Bean 1972, pages 57–58).

Small game, primarily rodents like rabbits, rats, mice, squirrels, and chipmunks were often available for hunting year-round if not in hibernation (Bean 1972, page 58). Bean speculates that small game, particularly rabbit, likely supplied most of the meat protein in the Cahuilla diet because of availability of large animal populations and their relative ease of capture. Three species of rabbit were available to Cahuilla: blacktailed jackrabbit (*Lepus californicus*), desert rabbit (*Sylvilagus bachmani*), and the desert cottontail (*S. audobonii*), and were important food sources in winter months when plant food sources were scarcer. A single hunter could capture a dozen rabbit in the early morning, using a bow and arrow, throwing sticks, nets, snares, traps, and fire (Bean 1972, page 58). Especially large rabbit hunting parties would use large nets and sometimes fire to supply large amounts of food for visitors and attendees of ceremonies that would sometimes last a week. Rabbit would be skinned by men and cooked by women, the flesh roasted,

bones crushed and eaten in soups or mush, and the fur distributed to women for making blankets and clothing (Bean 1972, page 58).

Birds were hunted year-round, though some were only available seasonally. The easily hunted quail (*Colius* spp.) was an important and favorite food source year-round, whereas other geese (*Anserinae* spp.) and ducks (*Anatinae* spp.) were only seasonally available and difficult to obtain (Bean 1972, page 60). Fall was a particularly productive season for bird hunting wherein large numbers could be captured using nets, traps, snares, and throwing sticks. While most bird species were hunted, ritually important birds like eagles and ravens were not.

Fish traps along the desiccated shore of Lake Cahuilla and traditional oral literature provide evidence that fish once played an important role in the Cahuilla diet (Bean 1972, page 62). However, within the ethnographic record little is documented regarding more recent contributions, though Bean notes that fish were occasionally caught in mountain streams and small lakes and occasionally obtained from neighboring groups.

Numerus reptiles served as food in the traditional Cahuilla diet, with the rattlesnake (*Crotalus* spp.), chuckwalla (*Saurmaulus obeus*), and desert tortoise (*Gopherus agassizi*) figuring prominently among their ranks. In the early spring lizards were abundant and provided food in a time of general shortage. Women and children pried lizards from their rocky hiding places with sticks or caught them in traps, and men caught poisonous snakes for food. They were prepared for eating by roasting or boiling, and the shell of the tortoise could be used for making household utensils and rattles (Bean 1972, page 61).

Several insects also provided significant contributions to the traditional Cahuilla diet, particularly grasshoppers (*Acrididae* spp.), cricket pupae (*Gryllidae* spp.), cicadas (*Cicadidae* spp.), and moth larvae (*Lepidoptera* spp.) (Bean 1972, page 62). Spring often brought the arrival of large swarms of grasshoppers and provided an opportunity for the insects to be harvested in large quantities. The arrival of these insects were celebrated with a first-fruit ritual prior to their harvest. Considered a delicacy, grasshoppers, cicadas, and cricket pupae were gathered, roasted, and consumed or dried and stored for future use to be eaten as is or added to other foods like acorn mush as a condiment (Bean 1972, page 62).

Agriculture. It was widely accepted, though not unanimously so, by researchers that the indigenous Southern California Indian groups to the west of the Colorado River were non-agricultural before the establishment of Spanish missions along the coast from 1769 to 1821. The prevailing belief was that aboriginal agriculture did not exist in Southern California. However, some evidence suggests that the Cahuilla and Southern Diegueño groups may have had agricultural practices before Spanish influence. The Cahuilla seemed to have adopted certain water-utilization techniques from neighboring tribes to grow crops without the need for traditional irrigation methods.

Lawton and Bean (1968, pages 200–205) point out that the feasibility of aboriginal agriculture among the Cahuilla is supported by their use of various water-utilization

techniques, such as dry-farming, conventional irrigation, artesian flow, runoff farming, and pot irrigation. These methods allowed them to cultivate crops in the arid desert environment of the Coachella Valley. Additionally, the Cahuilla's planting, cultivation, and other agricultural practices indicate a sophisticated understanding of their ecological surroundings and how to manipulate them for crop production.

Basketry and Pottery. The Cahuilla had traditions of manufacturing both basketry and pottery. The creation of baskets involved intricate weaving techniques using grasses such as deer grass (*Epicampes rigens*) and tule grass (*Juncus robustus*) or skunkbush (*Rhus trilobata*). Baskets were decorated with using various colors including black, yellow, red, brown, and green (Bean 1978, page 578).

These baskets came in four distinct types: flat baskets for plates or winnowing trays, shallow baskets for storing food or parching corn, large deep cone-shaped baskets for carrying with a net, and small globular baskets for holding small items (Kroeber 1976, pages 18–19). Designs on the baskets often featured cosmologically significant symbols like eagles, lightning, and stars (Bean 1978, page 579).

The Cahuilla also have a pottery tradition which produced vessels that were often painted and incised with intricate designs. This pottery, described by Kroeber (1908, page 55) as "a light, thin, rather brittle red ware" was crafted from thin, red clay coils that were refined and shaped using the paddle-and-anvil technique. Anthropologists have identified five forms that Cahuilla pottery was shaped into small-mouthed jars, cooking pots, open bowls, dishes, and pipes (Bean 1978, page 579).

Property/Resource Ownership. The Cahuilla had a complex understanding of property and ownership, which was shaped by their environment and economic needs. Ownership not only had economic implications but was crucial for minimizing conflicts over resources and providing a steady flow of goods within the community. Territorial ownership was demarked by petroglyphs or landmarks with oral traditions reinforcing these boundaries and historic rights which were believed to have been established by cultural heroes (Bean 1978, page 582).

Ownership of land and particularly resources was structured at both the clan (sib) and lineage levels. While the clan owned a large territory that was jointly held by all members, lineages owned specific sections of land, including village sites, an obsidian quarry, hunting areas, and resource-rich areas such as oak groves, pinyon forests, mesquite thickets, or specific hillsides covered with cacti or yucca (Bean 1972, page 126). Individual families within the lineage held ownership of specific trees, groves, or patches of land containing valuable food or material resources.

Individual ownership concepts were highly developed among the Cahuilla and included a wide range of items from subsistence resources such as gathering patches to specific oak trees, to personal belongings like tools or baskets (Bean 1972, pages 127–129). The Cahuilla concept of individual ownership extended to intangible items such as such as stories, songs, or names. Material personal possessions included hunting gear or food

preparation tools, clothing, jewelry, baskets, and shell money, and ownership rights extended to male and female adults as well as children. Property rights, however, were often divided by gender with certain songs, games and rituals exclusively reserved for men or women. The transfer of property through gifting, exchange, or sale was allowed, but specific items like baskets and ground stone food processing implements like manos and metates had to be bequeathed before death; otherwise, they were destroyed to prevent conflict and supernatural repercussions.

The Cahuilla maintained a strong focus on property and ownership due to their complex social structure and potential ecological instabilities within their ecosystem. Researchers theorize that ownership ensured the protection and control of stable resources, like food-producing trees, while allowing for flexibility in the management of less predictable resources to avoid conflicts between groups (Bean 1972, pages 128–129). Ownership concepts were deeply ingrained in Cahuilla society and reflected in their creation legends and spiritual beliefs, which emphasized ownership of the universe and specific geographic locations by spirit beings.

Bird Dance. The bird dance in Cahuilla culture was a festive event that involved men and women coming together to sing dramatic songs about environmental conditions and historical events through anthropomorphized birds (Bean 1972, page 149). Lead singers and followers participated in the dance accompanied by rattles, with considerable food prepared for all participants. Traditionally organized by the net, the bird dance provided a time for social relaxation and interaction, with women inviting men to dance and playful teasing between participants. While modern bird dances are held on special occasions, the dances have ecologically adaptive aspects, teaching lessons about proper behavior and adaptation through stories of birds facing challenges and the consequences of their actions.

Worldview. The Cahuilla worldview revolves around the concept of *iva a*, a powerful and unpredictable force present in all things since the beginning of time. The unexpected departure of *iva a* could bring about natural disasters like earthquakes, floods, and droughts (Bean 2020, page 99). The fickle and unpredictable nature of *iva a* instilled in the Cahuilla a sense that all of creation was unpredictable and subject to unpredictable change at the whim of *iva a* (Bean 1972, page 163). This understanding of the unpredictable and everchanging world was further reinforced through oral traditions and creation accounts of cultural heroes who were often imperfect, indecisive, made mistakes, and caught in conflicts of power with others. Individuals and all spiritual beings possessed *iva a* and could harness its power in an everchanging world. Those possessing a great deal of power were responsible for using it correctly for the benefit of all, while misuse could lead to harm, such as causing food scarcity or personal misfortune. To the Cahuilla all beings, including humans, were seen as integral parts of nature and the universe, with human actions believed to have the ability to impact the entire system (Bean 1972, page 164). The Cahuilla understood their interdependence on a dynamic natural and social landscape and strove to maintain balance in the world. Efforts to maintain or restore

balance were enacted in the Cahuilla's rich body of ceremonies, rituals, cultural norms, and practices.

Elders played a significant role in Cahuilla society, serving as repositories of knowledge and lore essential for adaptation and survival in a challenging environment (Bean 2020, page 100). They passed down values and skills crucial for successful adult life and taught younger generations traditional practices and techniques. Reciprocity was a fundamental value in Cahuilla culture, with a strict system of reciprocal relations operating at all levels of society. Failure to reciprocate could result in public sanctions and loss of assistance, emphasizing the importance of sharing and fairness within the community. Careful and deliberate action was encouraged to avoid hasty decisions that could have negative consequences, while integrity, dependability, and direct communication were expected in personal relationships to prevent misunderstandings.

Secrecy and caution in handling knowledge were essential in Cahuilla life, with the judicious use of knowledge leading to praise and rewards, while misuse could result in severe punishment (Bean 2020, page 101). The Cahuilla people passed down their knowledge of the earth's creation and the origin of life on earth through the generations, reflecting their reverence for tradition and the wisdom of their ancestors. The Cahuilla worldview emphasizes respect for the interconnectedness of all beings and the responsible use of power for the well-being of the community and the environment.

Several ethnographic landscape features within the PAA are identified in Bean et al. (1991, page 2), and in their introduction, the authors state that most of the places discussed in the publication are considered sacred or historically significant by the Cahuilla people, underscoring their concerns about potential impacts on these locations.

Drawing upon information gathered from numerous interviews and testimonials with Native Americans regarding their concerns for cultural resources, Bean et al. (1991, page 3) identify the various types of places deemed sacred, including:

> "Sources of residual sacred power, creation sites, and other sites named after or closely identified with powerful sacred persons or happenings. In southern California, these are often mountain tops, but may also be caves, rockshelters, springs (especially hot or mineral), or rock art sites."

Ethnographic reference to the mudpots and mud volcanoes, as well as the rhyolitic domes within the project area of analysis (PAA) can be found in Bean et al. (1991) and are drawn upon the recollections of Francisco Patencio, a *Kauisik* Cahuilla of the Agua Caliente Band of Cahuilla Indians at Palm Springs, recorded by Kate Collins and published in *Stories and Legends of the Palm Springs Indians* in 1943, with additional information subsequently published by the Palm Springs Desert Museum in 1971.

Mudpots & Mud Volcanoes

Bean et al. (1991, page 72) identifies the mud volcanoes at the Salton Sea as *Par-powl* "Water bewitched, based upon an account provided by Patencio (1971, pages 18–19).

"It always was bad country about those hills or islands even when the water was there. There were acres of boiling mud springs all around. The water was very hot. East from the biggest hill, but in the same place, there were more mud springs, but much worse. They did not bubble on the ground quietly – no. They boiled and hissed. No one could go close to them, for the ground was sticky and soft and the air was poisoned with gas."

"There were many of these mud springs in the place. Some were very small and others so large that the hot gray mud piled on itself around the spring until it rose 15 to 20 feet in the air. Then it fell off, to build up once again. The steam rises from the center of the mud stacks and at the top, mud could be seen jumping and whirling. People now call these Mud Volcanoes."

Potencio provides further description of the Mud Pots stating: "Sometimes the mud pots do not build themselves into mud walls but lie like pools on the ground, many feet across. But always boiling steam, hissing and whirling. The Indian people do not go very near them. It is very dangerous and there is nothing to go to them for. The Indians called the place Par-powl, which means water bewitched, and they stayed away".

Potencio provides caution and illustrates the danger associated with visiting the mud pots and mud volcanoes.

Rhyolitic Domes

Paint Island

Bean et al. (1991, page 68) provides a description of "Paint Island" (now known as Red Island or Red Hill) and the now dried-up springs on it.

One of three islands (along with Pelican Island, Mullet Island and Three Buttes) in the Salton Sea that once were mud volcanoes. "Paint Island and Mullet Island are connected by paths. These paths are shoveled mud raised above the water level. They are dry on top, but shake like jelly underneath…The wet paths that once rocked when you walked on them are dry and firm now. Now, where once springs were bubbling everywhere on Paint Island, it is a hard crust of salt. (Patencio 1971, pages 17–18).

Pelican Island

An island in the Salton Sea that was once notable as a pelican hatchery. At nesting time there were so many pelicans in the air that the island was lost to view (Patencio 1943, page 85; Patencio 1971, pages 17–18).

Three Buttes

"There are several small islands, or hills when the water is not there, at the end of the Salton Sea" (Patencio 1943, page 85).

"When the ocean was gone and the valley was dry land, the Indians went to the Three Buttes—Mullet Island, the largest hill, and Paint and Pelican Island – the next in size.

Here they broke off pieces of flint or volcanic glass to make arrow point and knives". (Patencio 1971, pages 17–18.)

Quechan

The Quechan (also referred to as the Yuma) are a Yuman-speaking group of the Western Hokan language stock. Their territory encompassed both sides of the Colorado River and, according to Quechan oral tradition, extended along the Colorado River from Blythe in the north to Mexico in the south. At the time of sustained European contact in the seventeenth century, the Quechan people numbered in the thousands. The largest concentration of Quechan traditionally lived at the confluence of the Colorado and Gila rivers, although they were strangely not reported in that area in 1540, when the Alarcón and Díaz expeditions reached the confluence (Forbes 1965; Forde 1931). Nevertheless, in the following century large Quechan villages existed in the area.

Quechan subsistence was based on horticultural practices, fishing, hunting, and gathering. During the winter and spring, Quechan groups lived in seasonal village settlements on terraces above the river floodplain. After the spring floods receded, small family groups would disperse to their agricultural plots along the river to plant crops. Planted crops included maize, beans, watermelons, pumpkins, muskmelons, and wheat. Deer, rabbit, and birds were hunted. Mesquite pods and screwbeans were important gathered wild staples (Wullenjohn 1998).

After the harvest in the fall, the Quechan would gather again in the large villages on the terraces, where stored agricultural foods, fishing, and limited gathering allowed them to live together through the winter (Bee 1983; Forde 1931). In all times but high flood, fishing in the Colorado River provided an important source of protein.

Numerous named villages were along the terraces above the lower Colorado River flood zone. The village known as *Avi Kwotapai* was on the west side of the Colorado River between Blythe and the Palo Verde Valley, and *Xenu mala vax* was on the east side of the river near present-day Ehrenhberg (Bee 1983). Quechan and other Yuman-speaking groups report well-traveled trails that extend along the Colorado River as well as trail networks between peaks and other significant landscape features (see discussions in Cleland and Apple 2003).

The Quechan were well versed in warfare and often became involved in conflicts with neighboring tribes over fertile river territories. They developed an alliance with the Mojave and successfully displaced the Halchidhoma from their lands along the Colorado River near the vicinity of present-day Blythe.

The 1540 expeditions of Alarcon and Díaz did not specifically identify the Quechan people. The first information clearly pertaining to them comes from records of Juan de Oñate's expedition to the Colorado River via Bill Williams Fork in 1604.

A Quechan captain told Oñate that it was a five-day journey to the coast (Forbes 1965, page 109). At the time of the Oñate expedition all the Colorado River tribes were involved

in widespread trading, as discussed earlier. The Quechans were well informed about the land and peoples to the north of them. They stated that it was only 30 days to the source of the river and that six days beyond that there were bison and deer (Forbes 1965, page 110).

The next Spanish contact came in 1699 (Spicer 1962, page 263) when Father Kino contacted two Quechan villages on the Gila River (near the Colorado) which he designated "San Pablo" and "San Pedro." He found Quechan living on the Colorado River as well. He noted that the Quechan were raising various kinds of crops and fishing with nets and tackle. Moreover, in the time between the Oñate and Kino expeditions, the Spanish slave trade began to alter patterns of warfare along the Colorado. (Forbes 1965, pages 118–119.)

Although the Spaniards continued their activity in the Southwest, it was not until 1746 that the Quechan were again visited by a literate explorer. In the intervening 40 years since Father Kino's expeditions, diseases introduced by the Europeans had caused widespread epidemics and population decline among the Quechan as well as the rest of the Colorado River tribes. The Spanish slave trade was becoming increasingly destructive. Not only were members of the various groups being taken as slaves but the increased warfare and hostility was causing higher mortality rates. Livestock was introduced during the early 1700s, possibly earlier. Horses quickly became a trade commodity, especially in trading for slaves (Forbes 1965, page 135). By 1771 Spanish activity began to increase again because of the Spaniards' rising interest in the "Yuma Route" from Sonora to California. Fray Francisco Garcés first visited the Quechan in 1771 (Forbes 1965, page 145; Spicer 1962, page 264). He remained active in the area for 10 years. During this time Quechan culture changed due to Spanish influence. Poultry had been introduced sometime in the 1770s. Wheat had by this time become a non-irrigated winter crop. Spreading disease and increasing warfare due to the slave trade were other influences. An expedition led by Juan Bautista de Anza introduced syphilis to the Quechan in 1774 (Forbes 1965, page 174).

Garcés was very active in his missionary activities among the Quechan until 1781. During this time, however, the Quechan were becoming more and more restless under the Spanish yoke. Garcés and his settlers had arrived (in 1779) at the Colorado River under-supplied and ill-equipped for even a short stay, let alone permanent settlement. They survived because of the Quechan's stores of foodstuffs and seed which they used for planting crops. During the 1770s, groups of Spanish passed through on their way to California, eating up the food supply and allowing large herds of livestock to graze in Quechan fields.

In the summer of 1781, the Quechan, with the aid of Mojave, revolted at the two Spanish pueblos of Yuma and Xuksi'l, destroying the main Spanish pueblo, San Pablo y San Pedro Bicuner, and the Mission La Purísima Concepción. When it was over, at least 95 of the settlers and soldiers had been killed, including the four Franciscans, among them Garcés (Forbes 1965, page 201; Spicer 1962, page 264). An additional 76 people were held captive (McCarty 1976, pages 36–40).

The significance of the Quechan revolt is comparable to that of the Pueblo revolt in 1680 (Forbes 1965, page 205). The difference was that Spanish domination over the Quechan Nation lasted for less than 10 years and, unlike the Pueblo tribes, the Quechan were never again under Spanish control.

After a brief retaliatory expedition between October 1781 and March 1782, the Spaniards left the Quechan alone, but intergroup contact continued in the guise of slave trade to Caborca. There is little in the records on the Quechan until 1820, when it was reported that Quechans were selling slaves in Sonora (Forbes 1965, page 236). The Quechan maintained their political autonomy and preserved much of their aboriginal culture. It seems certain that by 1771 the Colorado River tribes were trading and travelling as widely as in 1540. (Forbes 1965, page 147). Disease was still a major factor. Smallpox had been reported among the Papago in 1781 (Forbes 1965, page 208) and very likely had spread to the Quechan (Forbes 1965, page 109).

The first explorers from the United States crossed Quechan territory in 1827. One of the first such groups activated a period of intensive warfare in the northern Sonoran Desert amity-enmity system; as discussed earlier, the Quechan joined the Mojave in forcing the Panya out of the Colorado River Valley.

A few miles north of the village of *Xuksil*, on the west side the of the Colorado River, is the small mountain formation known as Pilot Knob (*Avi kwalal*). The small mountain just south of the main mass of Pilot Knob is called *Avi kwinuur*. Pilot Knob is a striking physical feature in the visual landscape of the eastern side of the Dunes. A number of tribes of the Lower Colorado region are associated with Pilot Knob in the ethnohistoric record, including the Quechan, Kamia, Halchidhoma, Kaveltcadom, Cocopah, Paipai, and Mohave. Quechan and Cocopah consultants identified Pilot Knob as a boundary between joint Quechan/Kamia holdings and Cocopah land (Russell et al 2002, page 37).

Russell et al. (2002, page 37) state that Pilot Knob is sacred to the Quechan and other Lower Colorado tribes. It is the point of departure and return for the all-important *Keruk* (mourning) ceremony, a place where dreams and visions were received, and figures importantly in the creation myths of the Yuman Tribes of the Lower Colorado region. It is the starting place for the traditional *Keruk* ceremony reenacting the death of the pan-Yuman creator god *Kukumat* and the procession carrying his body back to *Avi Kwame* (Newberry Peak or Spirit Mountain) north of Needles in Mohave territory. A major ceremonial stop on the pilgrimage was Picacho Peak (*Avi milyket*). The trails linking these sacred mountains with each other and with various village areas are of particular spiritual significance. These trails were utilized for religious pilgrimages associated with the *Keruk* ceremony, the most important and deeply religious of all pan-Yuman ceremonials, and they were also utilized for dream travel.

It is difficult to portray the complex and esoteric nature of Yuman spirituality because it is a dynamic belief system in which dreaming, adherence to traditional learning, personal experiences, and varying patterns of acculturation affect its expression. This world view stresses the interconnection of daily life with religion; the secular world exists

concurrently with the spiritual world for traditional Yumans, and the latter world can be experienced through dreams, vision quests, song cycles, the telling of the creation narrative, and many other oral traditions (Kroeber 1976).

Historic Setting

The Spanish period in this region began with the permanent settlement of Spaniards and the construction of the mission and presidio in San Diego in 1769. However, earlier Spanish explorations in Southern California took place as early as 1542, when Juan Rodriguez Cabrillo sailed along the coast of California and encountered Native Americans several times in southern California. However, one of the first examples of European contact with the Imperial Valley region occurred in 1771 when Father Francisco Garces embarked on a solitary journey through the Colorado Desert and encountered the New River. In 1781, the Spanish government established a permanent outpost at the Yuma Crossing, on the southeastern corner of the Colorado Desert, following the success of Juan Bautista de Anza in finding a route between Sonora and Spanish occupied Alta California. However, the following year, the outpost was destroyed during the Quechan revolt, closing the Anza route and hampering Spanish activities in the region. In 1785, Pedro Fages led an expedition to attempted to discover a route through the Colorado River that bypassed Quechan territory. However, despite early journey into the Imperial Valley, Spanish explorers and the Spanish government primarily focused on the coastal regions of Alta California, with few inland expansions or incursions into the more inland Imperial Region north of the Colorado River. (Beebe and Senkewicz 2001, pages 31–32, 115, 240; Lamb n.d.; Snell and Heintzelman 1978).

Following Mexico's independence from Spain, Mexican authorities attempted to reopen the route. Following multiple journeys into the Colorado Desert in the early 1820s, when Captain Jose Romero and Lieutenant Romulado Pacheco led an expedition into the desert in 1825 and built a small adobe and stone fort approximately 6 miles west of the present-day city of Imperial. This outpost was abandoned the following year after an attack by the Kumeyaay. This once again officially closed the route through the Colorado Desert until the Mexican American War when several military units traveled through the desert during the war. Mexican influence on the Imperial Valley tended to be indirect. With the end of the mission period, and the expansion of ranchos into mission-adjacent lands, many formerly mission-dependent Native Americans were pushed toward the desert due to the expansion and intensification of Mexican settlement in coastal California. This pattern of indirect influence due to the expansion of non-native settlers remained the norm until American industry brought newcomers into the Imperial Valley who intended to settle the land directly (Lamb n.d.; Voyles 2021, pages 44–45).

Early American industry in the Imperial Valley primarily revolved around resource extraction, including mining and salt harvesting, followed soon by agriculture. Settlers mined for gold in the Chocolate Mountains and for gold, silver, and lead in in the Pacific Mining District, now the Chuckwalla Mining District. However, the instability of the period's mining economies meant that miners who came to the region during a mining boom frequently left when prices fell. The Salton Sink, a dry lakebed with large salt deposits

formed by the historical creation and disappearance of Lake Cahuilla. While California Native Americans have always used the resource, American settlers extracted salt from the lakebed in the late nineteenth-century and into the early twentieth century. Without reliable refrigeration salt was a major method of food preservation. American corporations used both manual and industrial methods of salt extraction in the Salton Sink. In 1891, the New Liverpool Salt Company alone employed nearly 400 Desert Cahuilla workers to harvest the salt fields in the Salton Sink. Workers plowed the surface of the Salton Sink, piled the salt into mounds, and then packaged and shipped it on a large scale using the nearby Southern Pacific Railroad (Crane 1914, page 217; Voyles 2021, pages 46–47, 56–58).

While various explorers and settlers envisioned extensive economically productive settled agriculture in the Imperial Valley, it took until the early twentieth century for settlers to attempt this on a large scale. The Desert Land Act allowed thousands of settlers to stake agricultural claims in the Imperial Valley. Between 1901 and 1905, thousands of settlers made their way into the valley. Many of these settlers intended to plant crops since the land appeared especially fertile, despite the alkaline soil. To those who intended to farm in the Imperial Valley it seemed that it that the lack of consistent access to water for the arid ground was the only barrier for agricultural success, despite the worries of some commentators that many of the crops these newly settled farmers intended to grow would struggle in this harsh environment (Cory 1915, pages 1248, 1268–1269, 1271).

The Colorado River Irrigation Company, and later the California Development Company promised to provide water to these agricultural claims in the Imperial Valley. These companies succeeded in diverting a portion of water from the Colorado River using canals, including the Alamo Canal which they built in 1901, to irrigate the newly claimed farmland. The newly irrigable water drew even more settlers looking to grow crops in the Imperial Valley. However, the rapid pace of agricultural development and population growth in the Imperial Valley combined with diminishing amounts of diverted water due to the sediment piling up and blocking the original canal headgate, caused the Alamo River to dry and led to water shortages beginning in 1902. The California Development Company responded to the outcry and demands of agricultural landowners in the Imperial Valley by making two unprotected cuts into the river's levee in 1904 in an attempt to divert water into the Alamo River. The first cut was made just below the international border, but was later closed after it began silting up. The second cut, made approximately 4 miles south of the border, was connected to directly to the Alamo River by canal with no headgate controlling the water's flow. However, the water quickly began eroding the levee surrounding the cut. Despite this, the California Development Company did not immediately act to install a headgate to control the flow of water and erosion because it was not perceived as an immediate concern since the company had previously mainly dealt with water scarcity (Dowd 1956, pages 7–10, 17–18, 21; Ross 2020, page 104).

In 1905, high spring waters swept through the weakened cut in the bank of the Colorado River overwhelmed the canal and irrigation system developed by the California Development Company. The torrent rushed through the New River and Alamo channels

and flooded the Imperial Valley and created the Salton Sea. It took two years for the California Development Company to contain the Colorado River, but during this time the newly formed sea swelled to a massive 400 square miles. The floods destroyed much of the irrigable land and left even more without access to water. These events bankrupted the California Development Company. The Salton Sea is not a new entity. Throughout the region's history, water from the Colorado River periodically flooded the Imperial Valley creating the historic Lake Cahuilla. While this two-year-long flood and the subsequent creation of the Salton Sea followed a well-established pattern, it still dramatically altered the landscape of the Imperial Valley and the lives of those who lived there (Dowd 1956, page 35–36, 41; Ross 2020, page 104).

In 1911, the Imperial Irrigation District (IID) was formed by state charter to acquire properties of the California Development Company. By 1915 it had 584,068 acres within its jurisdiction, and by 1922, the IID acquired 13 water companies. The IID quickly saw the need to build the All-American Canal to replace the Alamo Canal, to transport water more effectively and more permanently from the Colorado River to the Imperial Valley. The All-American Canal as envisioned by IID engineers would eliminate difficulties with an international water source and would substantially reduce the buildup of silt in the canal system. However, it took almost 20 years for this project to be completed since it hinged on the ability of the Hoover Dam to supply the Valley with a sufficient water supply (Dowd 1956, page 52–53, 84, 88; IID n.d.a "All American Canal"; IID n.d.b "IID History").

IID constructed three major distribution canals to move water into the Imperial Valley: The East Highline canal, Central Main canal, and Westside Main Canal. The East Highline Canal delivers irrigable water to IID areas east of the Alamo River and is made up of two reaches running from the Alamo Canal at the Laurence Heading in Mexico north to Niland. After it was constructed in 1914, a network of irrigation lateral canals was constructed at 0.5-mile intervals, the standard length of the agricultural parcels in this region. Much of the water that travels through these canal systems terminates in the Salton Sea through the Alamo River and New River. By 1930, IID operated almost 2,700 miles of irrigation canals, laterals, lateral drains, and deep drain outlets associated with the Alamo River and New River (Dowd 1956, pages 47, 76; IID n.d.a "All American Canal").

IID's irrigation systems heavily shaped the history of Imperial Valley. In 1913, 70,000 beef cattle, and 100,000 hogs were sold from the valley. And in 1914, the valley's 15,000 bee hives produced 750 tons of honey. Agriculture remains the predominant industry in the region. The area surrounding the project, like much of the Imperial Valley, is made up of actively farmed agricultural fields irrigated by canal systems connected to the East Highline Canal. The crops historically grown in the Imperial Valley include alfalfa, cereals, grapes, asparagus, cantaloupes, watermelons, dates, oranges, lemons, grapefruit, and cotton. By 1958, there were 497,000 acres of agricultural land in active use within IID's jurisdiction. None of this would have been possible without the extensive canal systems providing reliable access to water. The area surrounding the project has remained largely agricultural in nature throughout its history (Dowd 1960, page 3; Jacobs 2023i, Appendix A, Aerial Photos; McGroarty 1914, pages 21, 23–24, 27–28).

Conservation is the major outlier in land use for the region surrounding the project. With the influx of water in the Imperial Valley came the return of migratory bird species who rely on wetland habitats for stops during their migration. The Salton Sea became an important habitat for migratory bird species precisely when conservation efforts to preserve migratory birds was gaining traction in both popularity and legal protections. This culminated locally in 1930 when 32,766 acres in and around the Salton Sea were declared a wildlife refuge known as the Sonny Bono Salton Sea National Wildlife Refuge (SBSSNWR). This refuge is an important part of the Pacific Flyway, a major corridor for migratory birds, as well as an important habitat for birds native to the region (USFWS n.d.; Voyles 2021 pages 93, 99, 101, 108)

The refuge grew in 1947 following the donation of an additional 6,000 acres along the Salton Sea shore from the IID. The refuge itself has historically been an important contributor to the agricultural productivity in the region. Because of the large amount of waterfowl in the Imperial Valley, a significant portion of the valley's crops would have been consumed without the refuge providing a stable food source for the birds in the region. The refuge even supplemented natural food sources with purchases of grain to keep these birds away from the fields where they would impact agricultural operations (Laylander et al. 2008, page 42; Trotter 1973, 109–110).

In the mid-1960s the headquarters of the SBSSNWR moved to its current location at the intersection of West Sinclair Road and Gentry Road. However, all the original headquarters' building was replaced in 1983, and since then many more buildings were added to the property. The Quarters 7 building, which predated the headquarters' move to this property by over a decade, is the only original building on this property from the headquarters' early years (Jacobs 2023b, Appendix 5.3A-E2).

Regulatory

Projects proposed before the California Energy Commission (CEC) are reviewed to ensure that the proposed facilities would comply with all applicable laws, ordinances, regulations, and standards (LORS) (Pub. Resources Code, § 25525; Cal. Code Regs., tit. 20, §§ 1201[r], 1744[b]).

See **Table 5.4-2** for a summary of applicable LORS.

TABLE 5.4-2 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Applicable Law	Description
State	
Pub. Resources Code, § 5097.98	Requires a landowner on whose property Native American human remains are found to limit further development activity in the vicinity until s/he confers with the Native American Heritage Commission-identified Most Likely Descendants (MLDs) to consider treatment options. In the absence of MLDs or of a treatment acceptable to all parties, the landowner is required to reinter the remains elsewhere on the property in a location not subject to future disturbance.

TABLE 5.4-2 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS	
Applicable Law	**Description**
Pub. Resources Code, § 5097.99	Section 5097.99 prohibits the acquisition, possession, sale, or dissection with malice or wantonness of Native American remains or artifacts taken from a Native American grave or cairn.
Health and Safety Code, § 7050.5	This code prohibits the disturbance or removal of human remains found outside a cemetery. It also requires a project owner to halt construction if human remains are discovered and to contact the county coroner.
Local	
Imperial County General Plan: Conservation & Open Space Element (ICPDS 2016)	Use the CEQA process to conserve cultural resources and conform to…Assembly Bill 52 "Consultation with Tribal Governments". Public awareness of cultural heritage will be stressed. All information and artifacts recovered in this process will be stored in an appropriate institution and made available for public exhibit and scientific review.
	Encourage the use of open space easements in the conservation of high value cultural resources.
	Discourage vandalism of cultural resources and excavation by persons other than qualified archaeologists.
	Maintain confidentiality of specific resource locations to prevent vandalism and desecration of sensitive cultural resources.
Renewable Energy Resources Ordinance (MO, tit. 9, Div. 17, §§ 91702.00(A)(1), (B)(1)	If any specimens of bone, stone, ceramic, or any other prehistoric or historic material are discovered during construction, all construction affecting the discovery site shall cease until a qualified archaeologist, retained by the applicant and approved by the Department of Planning and Development Services, reviews the specimens.
	The recommendations of the archaeologist related to the discovery shall be complied with prior to resuming construction.
	Project construction and operations shall be conducted so as to protect…cultural resources…

Notes and Abbreviations: CEQA = California Environmental Quality Act; ICPDS = Imperial County Planning and Development Services; MLDs = most likely descendants; MO = Municipal Ordinance

Methods

The development of the inventory of historical resources in and near the proposed Morton Bay Geothermal Project (MBGP) is the requisite first step in the assessment of whether the MBGP would cause a substantial adverse change in the significance of a historical resource, and could, therefore, have a significant effect on the environment (Pub. Resources Code, § 21084.1). The effort to develop the inventory for the proposed MBGP involved background research, consultation with California Native American tribes, primary field research, interpretation of the results of the inventory effort, and evaluation of the significance of cultural resources found in the project area of analysis (PAA). This section discusses the methods and the results of each inventory phase, develops the historical resources inventory for the analysis of the proposed MBGP, and interprets the inventory to assess how well it represents the cultural resources in the PAA.

Project Area of Analysis

The PAA defines the geographic area in which the proposed project has the potential to affect cultural resources. Effects may be immediate, further removed in time, or

cumulative. They may be physical, visual, auditory, or olfactory in character. The PAA may or may not be one uninterrupted expanse. It could include the project area, which would be the site of the proposed plant (project site), the routes of requisite transmission lines and water and natural gas pipelines, and other offsite ancillary facilities, in addition to one or several discontiguous areas where the project could be argued to potentially affect cultural resources. Staff defines the MBGP's PAA as comprising (a) the proposed project site and associated facilities, (b) an ethnographic study area, and (c) an architectural study area set one parcel beyond the proposed project site.

The proposed project site and associated facilities are as follows:

- The proposed project site, which would house
  - A control building
  - One steam turbine generator system consisting of a condensing turbine generator set with three steam entry pressures
  - Geothermal fluid processing systems, including steam separation vessels, pipelines, and tanks
  - One 14-cell cooling tower
  - A Class II surface impoundment (brine pond)
  - A service water pond
  - A retention basin
- A 3.2-mile aboveground generator tie-line (gen-tie) interconnection between the project site and the IID switching station
- Twelve well pads that would house a total of 20 wells
- 5.3 miles of aboveground injection pipelines that would link the project site to offsite injection wells
- A 0.5-mile process water supply pipeline
- Potable water would be supplied through a reverse osmosis system or an equivalent system, and/or delivered through a commercial water service
- Up to nine laydown and parking areas, two construction crew camps, and up to four borrow pits throughout the area (Jacobs 2023a, pages 1-1, 1-2, 2-2.)

Staff defines the archaeological component of the PAA as the proposed project site and appurtenant facilities listed in the previous paragraph. Additionally, the archaeological PAA includes:

- A 200-foot buffer surrounding the project site, well pads, laydown and parking areas, construction crew camps, and borrow pits
- A 50-foot buffer around the proposed pipelines, process water connection, and gen-tie line

Excavation and other ground disturbance are proposed within the project site to variable depths, as documented in the MBGP application for certification (AFC) and presented in the following list. This information defines the vertical limits of the PAA.

- Power plant project site: 5 feet below existing grade
- Borrow site, construction laydown and parking areas, and construction camps: 5 feet below existing grade
- Buried pipelines: 5 feet below existing grade
- Production and injection well pads: 5 feet below existing grade
- IID switching station: 5 feet below existing grade
- Foundation piers for gen-tie pole structures: 30 feet below existing grade
- Footings to support aboveground pipelines: 20 feet below existing grade (Jacobs 2023a, Figures 2-7a–d.)

For ethnographic resources, the PAA is expanded to consider sacred sites, tribal cultural resources, traditional cultural properties (places), and larger areas such as ethnographic landscapes that can be vast and encompassing, including viewsheds that contribute to the historical significance of such historical resources.

In the rural context of the proposed MBGP, the PAA for built environment resources is defined as the proposed project site, any linear facilities, and a buffer of 0.5 mile around the project site and facilities (**Figures 5.4-1a to 5.4-1f**). The proposed project site at the MBGP is primarily undeveloped land, largely consisting of desert scrub, while related proposed linear infrastructure, lay down areas, and other proposed project elements extend to the north, east, and southwest of the project site. To the north of the MBGP, the PAA includes undeveloped parcels. To the east, the PAA includes the Hudson Ranch geothermal power plant, undeveloped parcels, and active agricultural fields. To the west and to the south of the project site, the PAA includes an Imperial Wildlife Area along the Alamo River, a salt flat, and several active agricultural fields, and related industrial and agricultural structures.

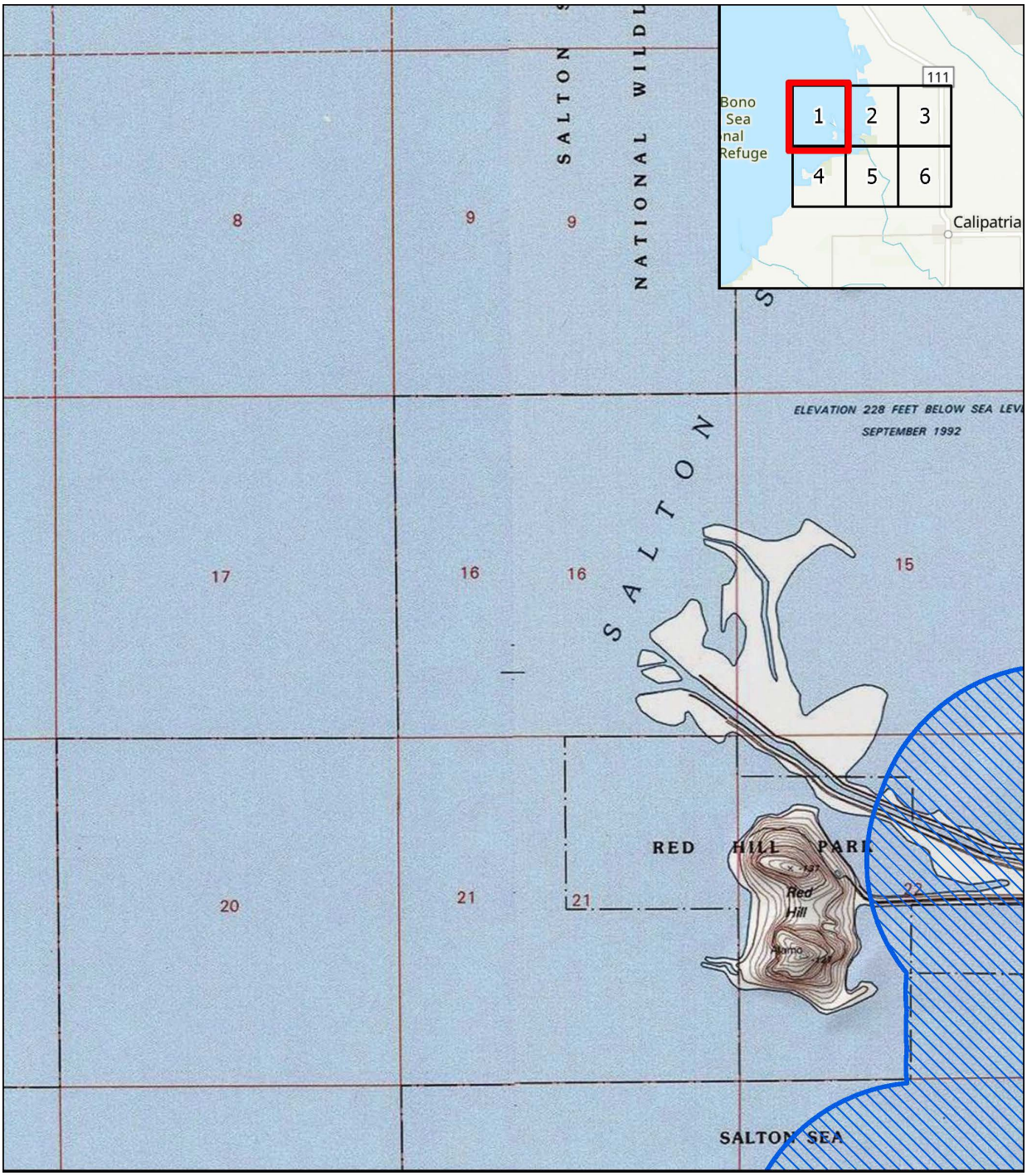


Figure 5.4-1a

Project Area of Analysis Archaeological & Built Environment

Source: Applicant Data 12/18/2023

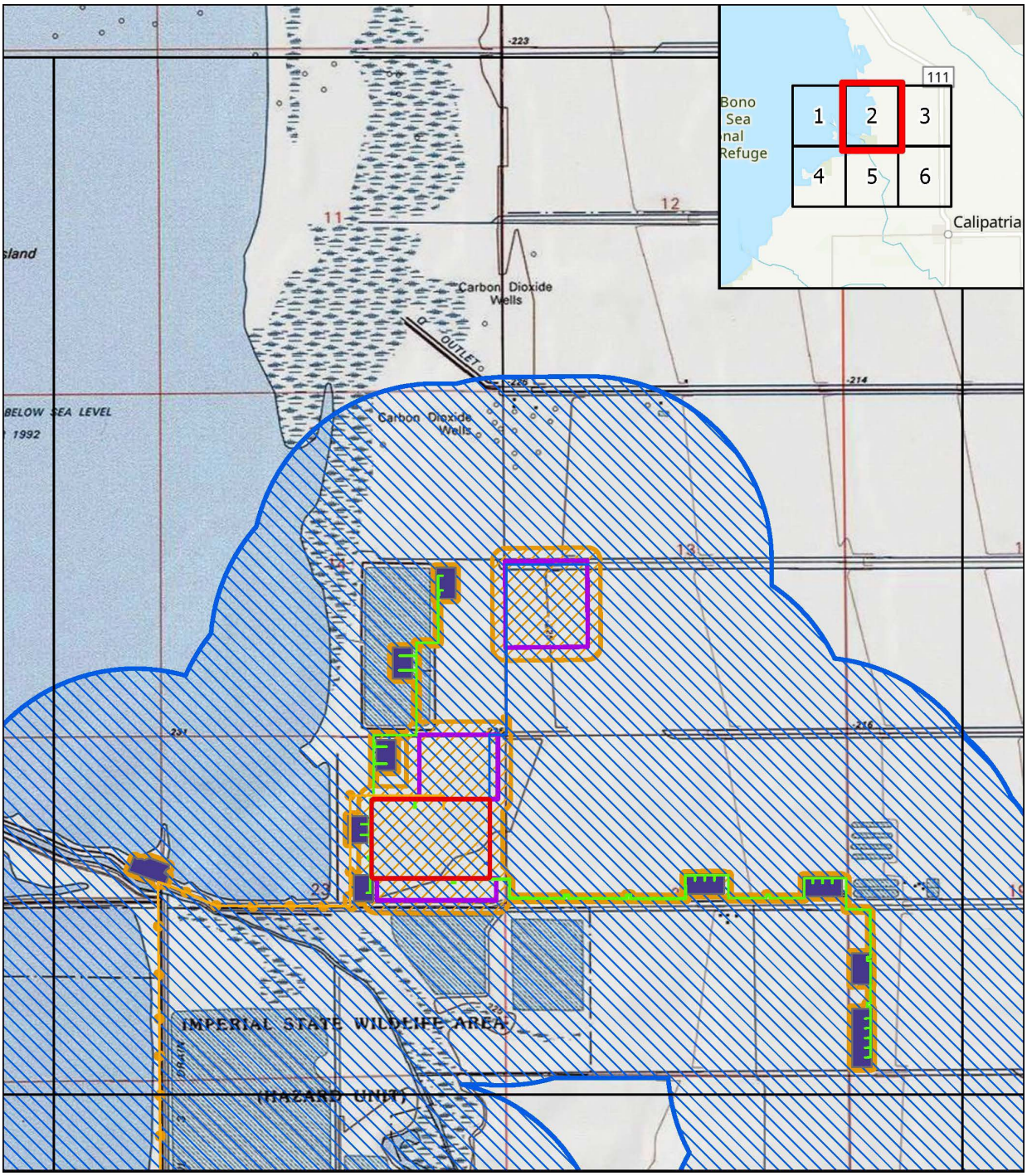


Figure 5.4-12

Project Area of Analysis Archaeological & Built Environment

Source: Applicant Data 12/18/2023

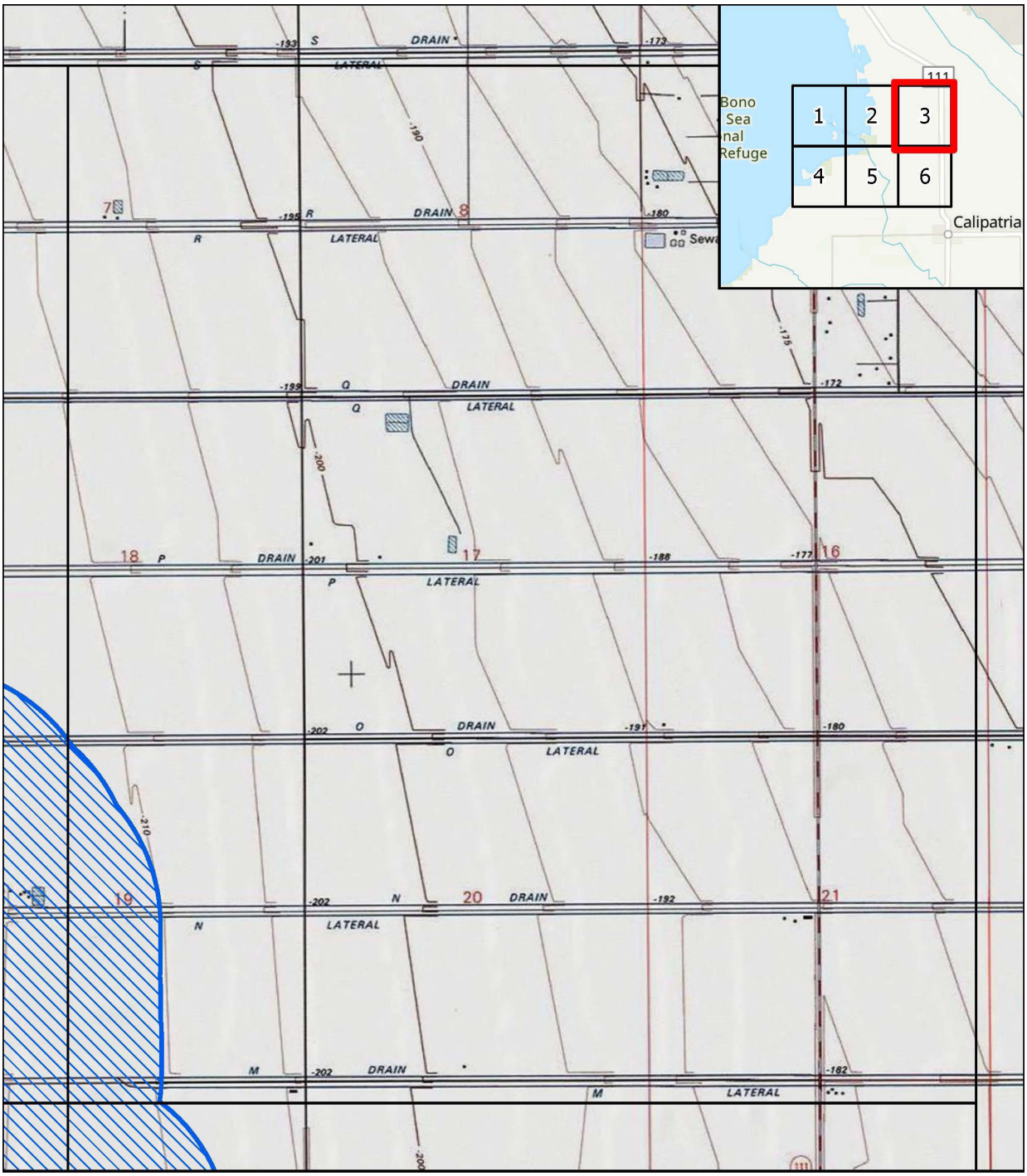
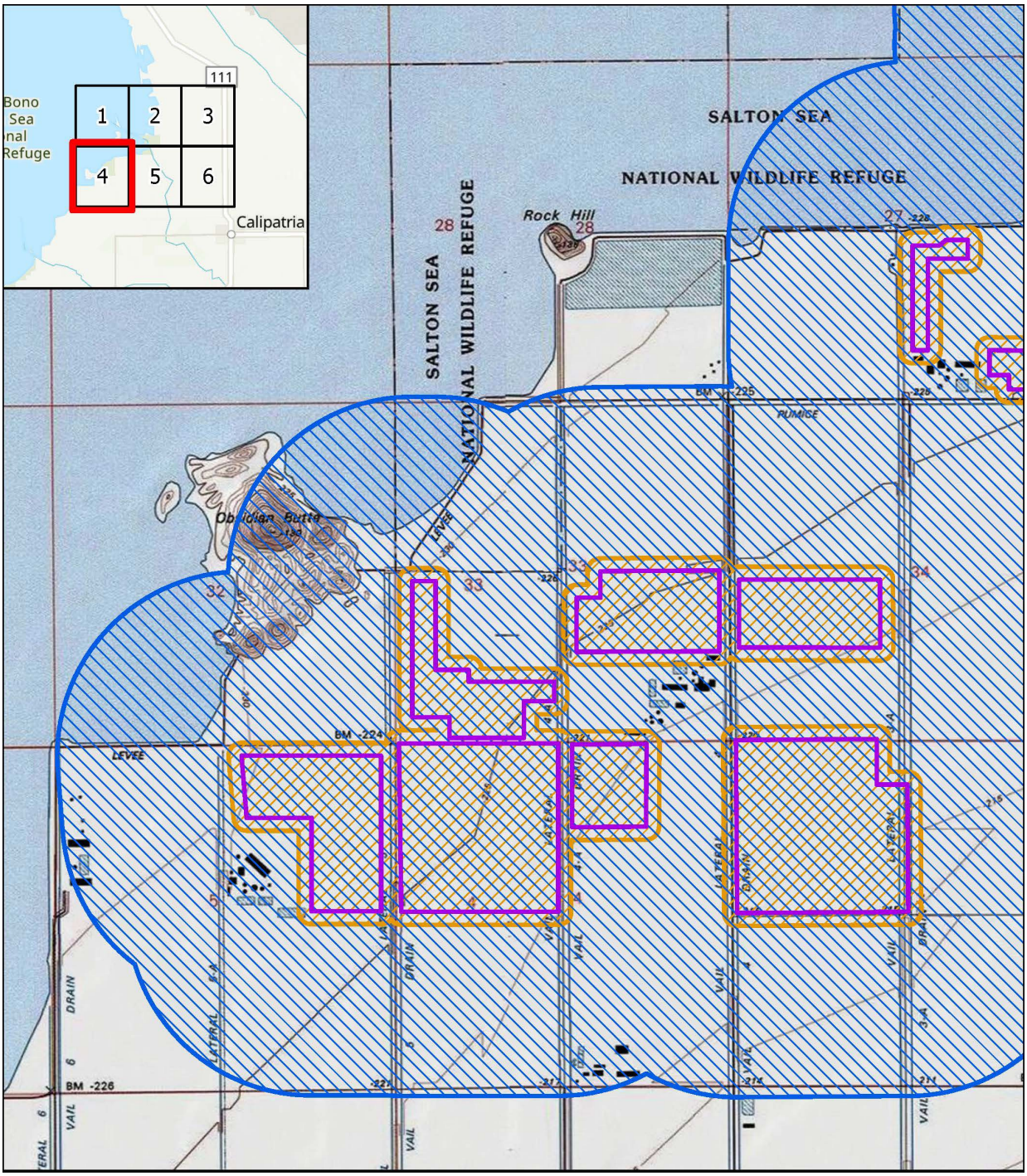


Figure 5.4-1c

Project Area of Analysis Archaeological & Built Environment

Source: Applicant Data 12/18/2023



Archaeological PAA
Built Environment PAA
Auxiliary Areas

Figure 5.4-1d

Project Area of Analysis Archaeological & Built Environment

0 0.5 1
Miles

Source: Applicant Data 12/18/2023

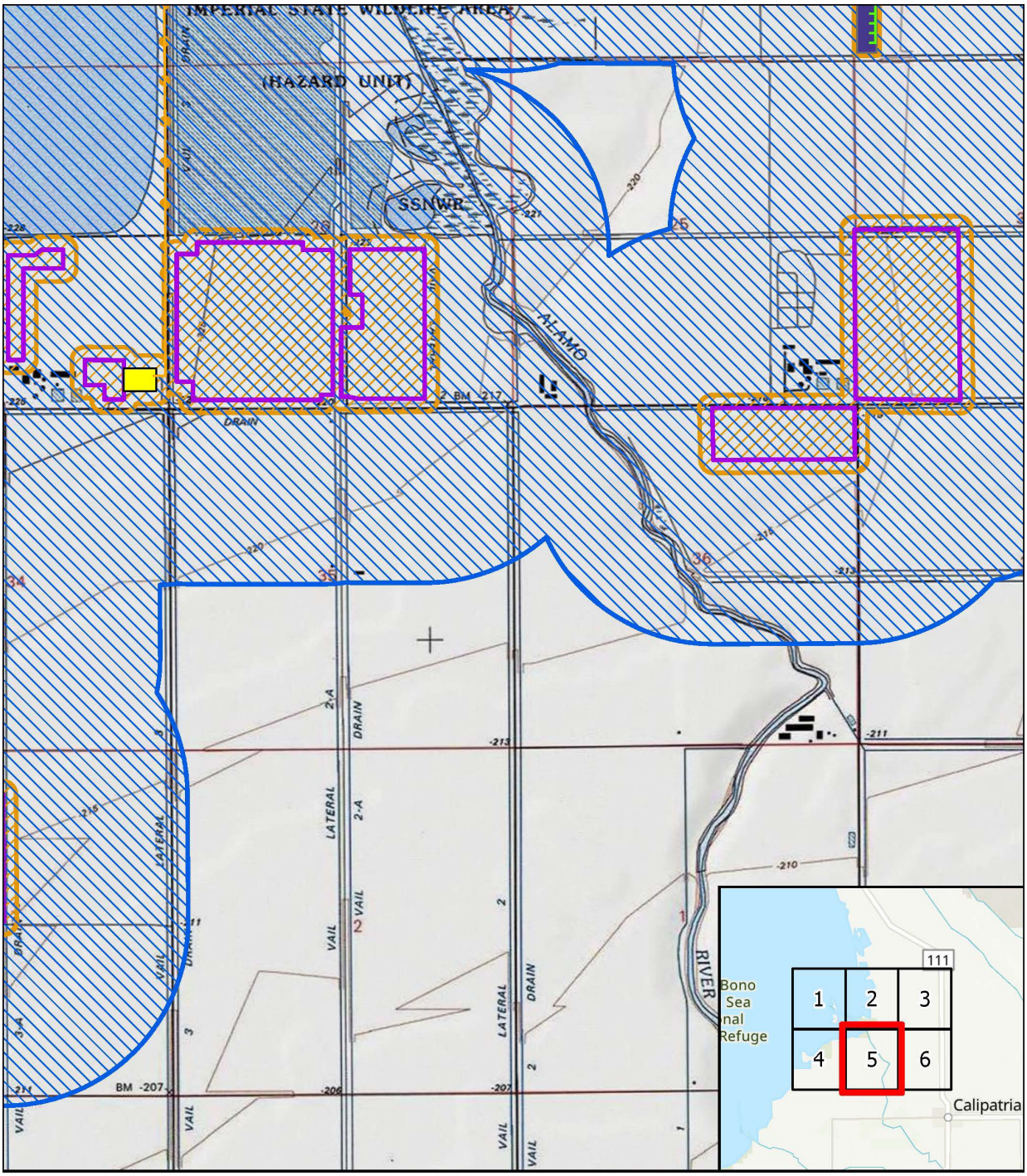
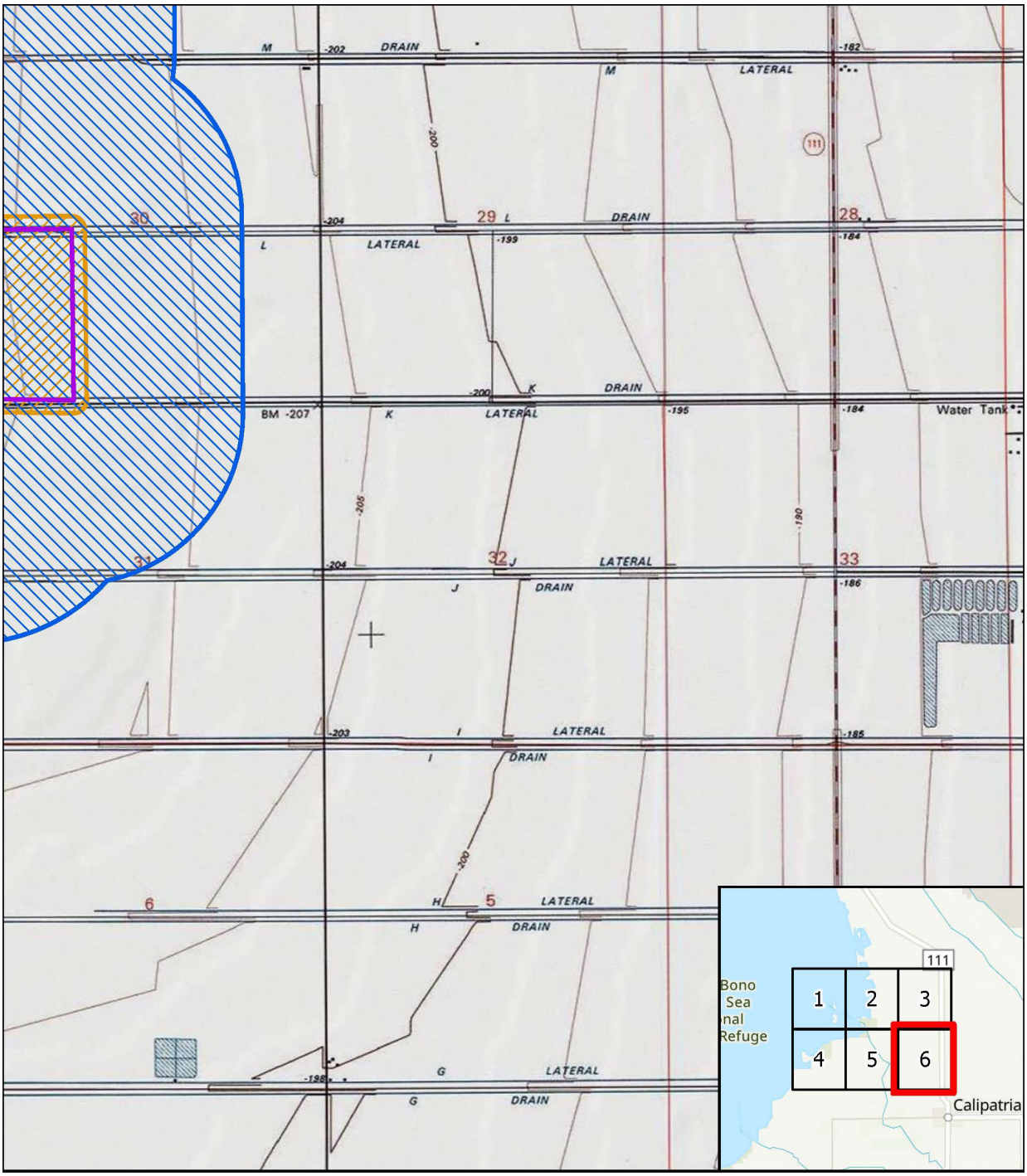


Figure 5.4-1e

Project Area of Analysis Archaeological & Built Environment

Source: Applicant Data 12/18/2023



Archaeological PAA
Built Environment PAA
Auxiliary Areas

Figure 5.4-1f
Project Area of Analysis Archaeological & Built Environment

0 0.5 1
Miles

Source: Applicant Data 12/18/2023

Background Research

The background research for the staff assessment employs information that the applicant and the California Energy Commission (CEC) staff gathered from literature and record searches, and information that staff obtained through consultation with affiliated Native American entities. The purpose of the background information is to help formulate the initial cultural resources inventory for the present analysis, to identify information gaps, and to inform the design and the interpretation of the field research that will serve to complete the inventory.

Records Search and Literature Review. The literature review and records search are purposed to gather and interpret documentary evidence of the known cultural resources in the PAA. The source for the present search was the South Coastal Information Center (SCIC) of the California Historical Resources Information System (CHRIS).

The applicant conducted a records search at the SCIC on March 23, 2022. The records search covered the proposed MBGP and a 1.0-mile buffer around all proposed project elements except for transmission lines, to which a 0.5-mile buffer applied. The records search included examinations of the SCIC's base maps of previous cultural resource studies and known cultural resources. (Jacobs 2023a, page 5.3-16; Jacobs 2023b, page 36.) The CEC staff supplemented this records search by examining its in-house holdings of previous cultural resource studies and known cultural resources, as well as internet sources of information, such as:

- National Register of Historic Places (NRHP) listings
- California Register of Historical Resources (CRHR) listings
- California Historical Landmarks listings
- California Points of Historical Interest listings (OHP 2023.)

Staff conducted an online search for proposed projects and environmental impact analyses using the websites of the County of Imperial and Sonny Bono Salton Sea National Wildlife Refuge (SBSSNWR). The purpose of this search was to identify cultural resource analyses that might not have been submitted to the SCIC or were submitted after March 23, 2022.

Staff also consulted the California Department of Transportation's Historic Bridge Inventory regarding bridges within the PAA (Blackmore et al. 2015; Hope 2004, 2005; Mead & Hunt 2010).

The literature review and records search indicate that 35 previous cultural resource studies have been conducted in the within one mile of the proposed project site and its facilities, or within 0.5 miles of proposed transmission lines. Of these, 20 cultural resource studies have been conducted within or adjacent to the archaeological and historic built environment portion of the PAA (Anonymous 2012; ASM 2007; ESA 2011; Ehringer 2011; ESA Community Development 2012; Giacinto 2011; ICPD 1979; Laylander et al. 2008;

Pentney et al. 2021; RTP 1994a, 1994b; Von Werlhof 1980; Von Werlhof and Von Werlhof 1978; WESTEC 1980, 1981a, 1981b, 1981c, 1981d, 1981e, 1981f).

The other 14 previous cultural resource studies were conducted between 0.5 and 1.00 mile of the proposed project footprint (Anonymous 2016, 2017; Castells 2016; Castells et al. 2017; CIPD 1984; Ecology and Environment 2012a; ICPD 1978; IWP 2013; McGown et al. 2001; Schaefer et al. 2010; Stanford and Lachman 2016; Von Werlhof 1978; Von Werlhof et al. 1977; Wirth 1980). In addition, previous research generated an overview study that encompasses the PAA (Norris and Carrico 1978).

The literature review and records search indicate that a total of 14 cultural resources have been previously documented in the Records Search Area. Staff identified an additional three resources within the project's PAA. Sixteen previously recorded cultural resources are within the project's ethnographic, archaeological, and built environment PAA (**Table 5.4-3**).

TABLE 5.4-3 LITERATURE REVIEW RESULTS: PREVIOUSLY RECORDED CULTURAL RESOURCES IN THE PAA

Resource Identifier	Type	Description	Location	Significance	Reference
P-13-000452 (CA-IMP-000452) Obsidian Butte	Native American archaeological site and TCP	Obsidian quarry	Ethnographic PAA	Recommended eligible for NRHP & CRHR	CEC 2003, page 60; Gates and Crawford 2010; Lange 2009; Romandia 1976
P-13-003251 (CA-IMP-003251H)	Historic site	Pond of good water (1856)	Ethnographic PAA	Unevaluated	SCIC
P-13-003254 (CA-IMP-003254H)	Historic site	Pure salt deposit (1856)	Ethnographic PAA	Unevaluated	SCIC
P-13-003255 (CA-IMP-003255H)	Historic site	Pond of salt water (1856)	Ethnographic PAA	Unevaluated	SCIC
P-13-003256 (CA-IMP-003256H)	Historic site	Mud volcanoes (1856)	Ethnographic PAA	Unevaluated	SCIC
P-13-003257 (CA-IMP-003257H)	Historic site	Mud volcanoes (1856)	Ethnographic PAA	Unevaluated	SCIC
P-13-003258 (CA-IMP-003258H)	Historic site	Mud volcanoes (1856)	Ethnographic PAA	Unevaluated	SCIC
P-13-006638 (CA-IMP-006638)	Native American archaeological site	Low density lithic scatter	Ethnographic PAA	Unevaluated	ASA 1957
P-13-008176	Native American	Obsidian quarry	Ethnographic PAA	Unevaluated	Pierson n.d.

TABLE 5.4-3 LITERATURE REVIEW RESULTS: PREVIOUSLY RECORDED CULTURAL RESOURCES IN THE PAA

Resource Identifier	Type	Description	Location	Significance	Reference
	archaeological site				
P-13-009110 (CA-IMP-008395)	Historic site	Carbon dioxide wells	Outside of PAA	Unevaluated	SCIC
P-13-013841	Historic structure	Cement-lined canal	Outside of PAA	Unevaluated	SCIC
P-13-014277 (CA-IMP-012061)	Historic site	Refuse Scatter	Outside of PAA	Recommended ineligible for NRHP	Schaefer et. al 2010
P-13-014278	Historic structure	Segment of O Lateral canal	Built Environment PAA	Recommended ineligible for NRHP	Schaefer et. al 2010
P-13-014279	Historic structure	Segment of N Drain	Built Environment PAA	Recommended ineligible for NRHP	Schaefer et. al 2010
Obsidian Butte Lithic Scatter	Native American archaeological site	Lithic scatter	Ethnographic PAA	Recommended eligible for NRHP & CRHR	CEC 2003, page 60; Sharpe 2003
P-13-018312	Historic building	Quarters 7, SBSSNWR	Historic built environment PAA	Recommended ineligible for NRHP	Speulda-Drews 2021
P-13-018705	Historic structure and archaeological site	Historic water retention basin and historic artifact scatter	Outside of PAA	Recommended ineligible for CRHR	Chambers 2021; IVPC 2021; Pentney et al. 2021
P-13-018706	Historic structures and archaeological site	Historic refuse scatter and duck-hunting ponds	Archaeological PAA	Determined ineligible for CRHR	Chambers 2021; IVPC 2021; Pentney et al. 2021

Notes: ASA = Archaeological Survey Association of Southern California; CA = California; CEC = California Energy Commission; CRHR = California Register of Historical Resources; IMP = Imperial County; n.d. = no date; NRHP = National Register of Historic Places; PAA = project area of analysis; SBSSNWR = Sonny Bono Salton Sea National Wildlife Refuge; SCIC = South Coastal Information Center; TCP = traditional cultural property

The CEC staff conducted additional research at the CEC library through inter-library loans services, the California History Room of the California State Library in Sacramento, the Palm Springs Public Library, and online sources. The CEC staff also consulted the reports contained in the applicant's records searches to improve the historic map coverage acquired by the applicant (Jacobs 2023i, Appendix A, The EDR Aerial Photo Decade Package and EDR Historical Topo Map Report). The purpose of this research was to obtain a visual understanding of the natural and cultural development of the land in and around the PAA, identify locations of potential historic built environment and archaeological resources, and have a partial, chronological record of disturbances in the PAA. To this

end, staff attempted to locate detailed maps of the PAA at 10-year intervals (per Conzen 1990, page 189), beginning about A.D. 1769 and moving toward the present. All consulted historic maps are presented in **Table 5.4-4**.

TABLE 5.4-4 HISTORIC MAPS CONSULTED

Map Name	Scale	Survey Date	Reference
Map of T 12 S, R 13 E	Not stated	1855, 1856	GLO 1856a
Map of T 11 S, R 13 E	Not stated	1855, 1856	GLO 1856b
Map of T 11 S, R 14 E	Not stated	1855, 1856	GLO 1856c
Official Map of San Diego County	1 inch = 3 miles	1889	Beasley 1890
Map of T 11 S, R 13 E	1 inch = 40 chains	1915	GLO 1916a
Map of T 11 S, R 14 E	1 inch = 40 chains	1915	GLO 1916b
Map of T 12 S, R 13 E	1 inch = 40 chains	1915	GLO 1916c
Map of T 11 S, R 13 E	1 inch = 40 chains	1917	GLO 1917
Map of T 11 S, R 13 E	1 inch = 40 chains	1920	GLO 1920
Map of T 11 S, R 13 E	1 inch = 40 chains	1924	GLO 1924
Blackburn's Map of Imperial County	1 inch = about 2 miles	1929	Blackburn 1929
Aerial Photograph	1 inch = 500 feet	1937	Jacobs 2023i, Appendix A, Aerial Photos
Salton Sea Sheet	1 inch = about 4 miles	Compiled from maps dated 1937–1947	Army Map Service 1954
Calipatria Quadrangle	1 inch = 1 mile	Aerial photographs taken 1940, road data 1943	COE 1952
Aerial Photograph	1 inch = 500 feet	1949	Jacobs 2023i, Appendix A, Aerial Photos
Niland Quadrangle	1 inch = 2,000 feet	Aerial photographs taken 1953	USGS 1956a
Obsidian Butte Quadrangle	1 inch = 2,000 feet	Aerial photographs taken 1953	USGS 1956b
Niland Quadrangle	1 inch = 2,000 feet	Photoinspected 1976	USGS 1985
Obsidian Butte Quadrangle	1 inch = 2,000 feet	Photorevised 1976	USGS 1976
Aerial Photograph	1 inch = 500 feet	1976	Jacobs 2023i, Appendix A, Aerial Photos

Notes: COE = Corps of Engineers; E = East; GLO = General Land Office; R = Range No.; S = South; T = Township No.; USGS = U.S. Geological Survey

Native American Consultation

The Governor's Executive Order B-10-11, executed on September 19, 2011, directs state agencies to engage in meaningful consultation with California Indian Tribes on matters that may affect tribal communities. The California Natural Resources Agency adopted a Final Tribal Consultation Policy on November 20, 2012. The adopted policy exhorts informed decision making by collaboratively working with tribes to seek positive, achievable, and durable outcomes. The CEC tribal consultation policy furthers the CEC's

efforts to engage in effective dialogue concerning proposed power facility potential impacts to cultural resources of concern to tribes (CEC 2021). In addition to agency requirements to consult tribes, the CEC's Siting Regulations require applicants to contact the Native American Heritage Commission (NAHC) for information on Native American sacred sites and a list of Native Americans interested in the project vicinity. The applicant is then required to notify those Native Americans on the NAHC's list about the project and include a copy of all correspondence with the NAHC and Native Americans, including any written responses received, as well as a written summary of any oral responses in the application for certification (AFC) (Cal. Code Regs., tit. 20, § 1704[b][2], Appendix B[g][2][D]).

The NAHC is the primary California government agency responsible for identifying and cataloging Native American cultural resources, providing protection to Native American human burials and skeletal remains from vandalism and inadvertent destruction, and preventing irreparable damage to designated sacred sites and interference with the expression of Native American religion in California. It also provides a legal means by which Native American descendants can make known their concerns regarding the need for sensitive treatment and disposition of Native American burials, skeletal remains, and items associated with Native American graves.

The NAHC maintains three databases to assist cultural resources specialists in identifying cultural resources of concern to California Native Americans. The NAHC's Sacred Lands File database has records for areas, places, sites, and objects that Native Americans consider sacred or otherwise important, such as cemeteries and gathering places for traditional foods and materials. The NAHC Contacts database has the names and contact information for individuals, representing a group or themselves, who have expressed an interest in being contacted about development projects in specific areas. Finally, the Digital Atlas of California Native Americans is the NAHC's comprehensive web-based resource, comprising a geographic information system of tribal lands and territories, native history and use of the environment, and tribal atlas pages written by California Native American tribes (https://nahc.ca.gov/cp/).

Applicant's Methods. On August 8, 2022, the applicant requested from the NAHC a search of the Sacred Lands File and a list of contacts among California Native American tribes affiliated with MBGP area. The applicant used a tribal contact list from "a nearby project" to send initial outreach letters on August 9, 2022. On December 7, 2022, the applicant mailed and emailed letters to tribal members on an MBGP-specific contact list dated October 13, 2022. The letters and emails requested information about cultural resources in the proposed MBGP study area. The applicant also placed follow-up phone calls and emails on August 25 and December 7 and 21, 2022. (Jacobs 2023a, pages 5.3-34, 5.3-35.)

CEC Staff's Methods. On May 3, 2023, the CEC staff requested from the NAHC a search of the Sacred Lands File and a list of contacts among California Native American tribes affiliated with the MBGP area. Following receipt of the NAHC's response, the CEC staff

mailed letters to 31 individuals among the following 18 California Native American tribes on August 1, 8, and 18, 2023:

- Agua Caliente Band of Cahuilla Indians (Cahuilla)
- Barona Group of the Capitan Grande (Diegueño)
- Campo Band of Diegueno Mission Indians (Diegueño)
- Ewiiaapaayp Band of Kumeyaay Indians (Diegueño)
- Iipay Nation of Santa Ysabel (Diegueño)
- Inaja-Cosmit Band of Indians (Diegueño)
- Jamul Indian Village (Diegueño)
- Kwaaymii Laguna Band of Mission Indians (Kwaaymii, Diegueño)
- La Posta Band of Diegueno Mission Indians (Diegueño)
- Manzanita Band of Kumeyaay Nation (Diegueño)
- Mesa Grande Band of Diegueno Mission Indians (Diegueño)
- Quechan Tribe of the Fort Yuma Reservation (Quechan)
- San Pasqual Band of Diegueno Mission Indians (Diegueño)
- Santa Rosa Band of Cahuilla Indians (Cahuilla)
- Soboba Band of Luiseño Indians (Cahuilla, Luiseño)
- Sycuan Band of the Kumeyaay Nation (Kumeyaay)
- Torres-Martinez Desert Cahuilla Indians (Cahuilla)
- Viejas Band of Kumeyaay Indians (Diegueño)

The CEC staff letters summarized the proposed MBGP along with the nearby, proposed Elmore North and Black Rock geothermal projects. The letters invited consultation with the CEC under the provisions of the California Environmental Quality Act (CEQA) for those tribes that have filed consultation request letters with the CEC pursuant to CEQA (Pub. Resources Code, § 21080.3.1(b)). For tribes that have not submitted consultation request letters under the Public Resources Code, section 21080.3.1(b), the CEC staff's letters invited consultation under the provisions of the CEC's Tribal Consultation Policy. The CEC staff followed up the letters with emails requesting consultation on September 7, 2023.

Consultation Results. The NAHC reported positive Sacred Lands File search results to the applicant on October 13, 2022, and to the CEC staff on June 9, 2023 (Jacobs 2023a, page 5.3-34).

The Viejas Band of Kumeyaay Indians wrote emails to the applicant and CEC staff, stating that the MBGP area has cultural significance that is tied to the Viejas Band, and that cultural resources have been within or adjacent to the MBGP area. The Viejas Band requested that a Kumeyaay cultural monitor be on site for ground-disturbing activities

and to be informed of any new discoveries such as inadvertent discovery of cultural artifacts, cremation sites, or human remains. The Viejas Band also wrote that if another tribe closer to the MBGP requests to perform cultural monitoring, then Viejas would defer to them. (Jacobs 2023a, page 5.3-35.)

The Tribal Historic Preservation Officer for the Jamul Indian Village informed the applicant that portions of the MBGP within Obsidian Butte are positive for cultural sensitivity (Jacobs 2023a, page 5.3-35).

The Cultural Resources Director for the Soboba Band of Luiseño Indians informed the applicant that the Soboba Band defers to more local tribes, including the Torres-Martinez Desert Cahuilla Indians and Quechan Tribe of the Fort Yuma Reservation (Jacobs 2023a, page 5.3-35).

The Agua Caliente Band of Cahuilla Indians' Tribal Historic Preservation Office wrote the applicant and CEC staff that the proposed MBGP lies within the tribe's Traditional Use Area. The Tribal Historic Preservation Office requested a copy of the cultural resources report and associated documentation, and the presence of an approved cultural resources monitor during ground disturbing activities. The applicant promised the request documentation when it became available. (Jacobs 2023a, page 5.3-35.) Additionally, the Agua Caliente Band requested from the CEC staff "An informational meeting with the developer, lead agency, and archaeologist regarding cultural compliance procedures for this project".

The chief executive officer of the Ewiiaapaayp Band of Kumeyaay Indians informed the CEC staff by email that the Ewiiaapaayp Band supports the MBGP and requested that staff keeps Mr. Micklin up to date on the MBGP's progress.

On September 29, 2023, Manfred Scott of the Kw'ts'an Cultural Committee, Fort Yuma Quechan Indian Reservation (Quechan), mailed a letter to the CEC staff requesting consultation on the MBGP. Quechan's letter expressed concern that the MBGP could cause direct and cumulative impacts to Quechan's cultural landscapes and resources.

The Kwaaymii Laguna Band of Mission Indians responded by email on August 25, 2022, requesting additional information regarding the MBGP location and the scope of work to be conducted. Ms. Coyle's request was forwarded to the CEC on August 29, 2022. On September 8, 2022, Ms. Coyle was informed her email had been forwarded to the CEC. (Jacobs 2023a, page 5.3-35.)

Ms. Carmen Lucas (Kwaaymii Laguna Band of Mission Indians) responded via telephone on August 29, 2022, and stated that she has serious concerns with the MBGP. She noted that the entire MBGP area is considered sacred with many cultural resources present in the vicinity. Resources and cultural landscapes in the area include Obsidian Butte, multiple mudholes, and the Ancient Lake Cahuilla cultural landscape. Ms. Lucas explained that obsidian from Obsidian Butte is found across southern California, including as far west as La Jolla, and that mudholes represent the heartbeat of Mother Earth. Ms. Lucas expects

adverse impacts would occur to Obsidian Butte, the mudholes in the area, and the Ancient Lake Cahuilla cultural landscape. She expressed opposition to the proposed MBGP. (Jacobs 2023a, page 5.3-35.)

Ms. Lucas (Kwaaymii Laguna Band of Mission Indians) and her legal counsel provided staff with information about the Southeast Lake Cahuilla Active Volcanic Cultural District (SELCAVCD) through virtual meetings; the August 31, 2023, joint site visits and informational hearing; and emails dating to September 5–7, 2023.

The Kwaaymii Laguna Band of Mission Indians identified numerous environmental concerns, as presented here:

1. Sensitive Receptors. Tribal cultural users of the sacred areas within the SELCAVCD, including elders, youth, and those with chronic health conditions, should be considered sensitive receptors relative to air, soil, and water quality health risks, as well as noise - this includes plant operations, steam release, alarms, and public address systems, lights, odor, and vibration—each of which can currently be experienced from existing operations near tribal cultural resource features and would only worsen with the addition of the proposed plants.
2. Alternatives. The Data Request directs that a Power Plant Cooling Alternative be studied. We respectfully request that a Tribal Cultural Resources Protection Alternative also be studied. Such an alternative would move the three facilities further from the SELCAVCD to reduce direct, indirect, induced, and cumulative effects. An adequate buffer between the projects and the SELCAVCD should also be studied to reduce and minimize effects. This Alternative should be developed in consultation with tribes culturally affiliated with the area.
3. Sensitive Biology. Biological resources in the area are part of the tribal cultural resource cultural landscape. These include burrowing owls, coyotes, reptiles, and other bird species. The components of the proposed projects that could cause harm to such species, like open brine ponds, must be studied and risks mitigated. We are also interested in consulting on the vegetation community maps one they become available as plants are often part of the tribal cultural resource cultural landscape.
4. Induced Effects. Construction and operations would bring people into the area on a full-time basis for many decades. This population as well as the facilities themselves would induce additional people to the nearby sensitive cultural areas. What measures could be taken to reduce such impacts? Fencing and boardwalks around mud pots would create adverse effects in and of themselves and create a petting zoo approach to what are naturally open and connected parts of the cultural landscape. More people also mean additional trash, waste, debris, and dumping. Who would be responsible for keeping the area clean? How effective are educational and awareness campaigns for workers and the public?
5. Construction Camps. Once more detail is available on the proposed construction camps we may have additional comments.

6. Visual Simulations. The visual simulations need to also show the current conditions so that they can be compared to proposed conditions. Also, relevant visual simulations from the tribal cultural resource cultural landscape features towards the proposed new plants must be undertaken in consultation with tribes culturally affiliated with the area. Raising grades by up to 7 feet to support the projects would only serve to worsen visual intrusions from and to nearby tribal cultural features.
7. Future Expansion/Related Development. We note that the three projects only propose to build on part of their parcel areas at this time. The remainder of the parcels do not appear subject to any future use restrictions. We are concerned about what future development might occur on these parcels. This is a particular concern as an agent for the applicant stated at the 08/31/23 public hearing that these three plants are being sited where they are because of proximity to existing plants. Also of concern, is the potential to co-locate future lithium extraction activities at these locations causing additional effects to the tribal cultural resources.
8. Additional Archaeological Surveys. Consistent with our prior correspondence with the applicant's consultants and our testimony at the 08/31/23 public meeting, we respectfully request that best practices be used for archaeological surveys. This includes: 1) the engagement of compensated, qualified tribal monitors on surveys, 2) the use of meaningful transects such as 5–10 feet so that resources may be seen, 3) that evaluations, interpretations, and Department of Parks and Recreation (DPR) 523 forms be performed in consultation with affiliated tribes. We would also support CEC staff managing cultural resource identification efforts to avoid potential conflicts of interest. An archaeological testing phase may also be appropriate depending on survey results and recommendations of the tribal monitors.
9. Tribal cultural resource/tribal cultural resource cultural landscape survey. Affiliated tribes supported by appropriate consulting staff should be engaged to identify tribal cultural resources that could be affected by the proposed projects. This effort is not the same as archaeological surveys. Access must be provided to knowledgeable tribal representatives to areas that could be affected by the project.
10. SELCAVCD. Documentation of this cultural district should be paid for by the project applicant as part of resource identification and evaluation obligations to determine the eligibility of the district. This documentation could then be taken to the State Historic Preservation Officer of California and Keeper of the NRHP in a tribally-driven manner for listing of the historic properties on the CRHR and NHRP.
11. Water. The projects' water source(s) are also a cultural concern. Pristine water taken from aquifers and springs should not be used for construction or operations as such use would only magnify tribal concerns as well as put at risk the areas of extraction which also likely are of cultural value.
12. Funding. What state and federal funding has been used to support the three proposed projects? This is important as state funding could bring in California Native American Graves Protection and Repatriation Act (CalNAGPRA) and federal funding could bring in the National Historic Preservation Act and NAGPRA.

13. Consultation Plan. Consistent with the updated CEQA Guidelines, development of a consultation plan in consultation with affiliated tribes would assist in promoting orderly and productive consultations between the tribes and the CEC.

Cultural Resources Inventory Fieldwork

This section discusses the methods and the results of each field inventory phase and interprets the resultant inventory relative to the cultural resources distribution models above to assess how well the inventory represents the cultural resources of the project area. Descriptions of each cultural resource in the inventory, evaluations of the eligibility of each resource for inclusion in the CRHR, assessments of project impacts on each known historical resource, consideration of and potential impacts on archaeological resources that might be buried in the PAA, and proposed mitigation measures for significant impacts may be found in the "Cultural Resource Descriptions and Significance Evaluations" subsection below.

The field efforts to identify cultural resources in the PAA consist of the applicant's pedestrian archaeological and historic built-environment surveys, and staff's field visits to the PAA. Personnel meeting the Secretary of the Interior's professional standards for archaeology and historic architecture led the applicant's cultural resource surveys, per the California Code of Regulations, Title 20, Section 1704(b), Appendix B(g)(2)(C) (Jacobs 2023c, pages 46–47 and Appendix 5.3A-A).

Pedestrian Archaeological Survey Methods. On behalf of the applicant, qualified archaeologists conducted an intensive pedestrian survey of the archaeological study area between August 9 and September 2, 2022, November 7 and 11, 2022, January 30–31, 2023, March 31, 2023, and September 12–14, 2023. The applicant's archaeological study area for the proposed project site, substation, borrow pits, and construction laydown/parking/construction camp locations included the project footprint plus a 200-foot buffer. For the proposed transmission line corridors, well pads, and pipelines, the study area included the project footprint with a 50-foot buffer. The archaeological survey consisted of parallel pedestrian transects spaced 33–50 feet apart. Surveyors opportunistically examined any subsurface exposures, including rodent burrows and cut banks. Survey crews navigated the transects using global position system (GPS) units. Archaeological resources were recorded with a sub-meter-accurate GPS unit. (Jacobs 2023a, page 5.3-15, Figures 5.3-1a–5.3-1e; Jacobs 2023bb, page 4-3, Figure DRR 31.)

Archaeologists documented the archaeological study area with digital photographs that included general views of the topography, vegetation density, and other images. They maintained a photograph log to include photograph number, date, orientation, photograph description, and comments. The surveyors inspected all areas likely to contain or exhibit sensitive cultural resources to ensure discovery and documentation of cultural resources within the survey area. In particular, the survey crews carefully inspected rocky outcroppings, banks, clearings, and other habitable flat areas. (Jacobs 2023a, page 5.3-15.)

All archaeological materials and features of an eligible age were recorded during the survey in accordance with Office of Historic Preservation guidelines (OHP 1995). Archaeological materials and features that could not be accurately dated in the field were also recorded. When archaeological remains were found during the survey, site boundaries were defined by surveying out in widening concentric circles until artifacts were no longer encountered. Artifacts or features that were within 100 feet of each other, or that were clearly related, were combined into the same isolate or site. All resources were digitally recorded in the field directly into a FileMaker database using an iPad. (Jacobs 2023a, page 5.3-15.)

Pedestrian Archaeological Survey Results. The archaeological study area consisted of agricultural fields, human-made ponds, a riparian landscape adjacent to the Alamo River, and mud flats. The topography is flat except for human-made canals and berms. Soils were fine- to medium-grained alluvial sandy loam that are light tan in color and composed of quartz and granitic material. The extensive agricultural and geothermal development in this portion of the valley left little natural vegetation in the archaeological study area. Only the Alamo River riparian corridor supported non-agricultural plant species: salt-cedar (*Tamarix chinensis*), common reed (*Phragmites australis*), arrowweed (*Pluchea sericea*), and saltbush (*Atriplex* spp.). Noted disturbances include agricultural fields, berms, canals, and ponds excavated for irrigation and hunting, and the construction and maintenance of numerous dirt, graveled, and paved roads. The surface of the graveled roads included a mix of imported gravel and local gravel with obsidian from the nearby Obsidian Butte. (Jacobs 2023a, page 5.3-23.)

Ground visibility across the archaeological survey area was variable. Although excellent visibility (close to 100%) was found in many areas, moderate visibility (25–75%) was noted near ponds and in some of the fallow agricultural fields. Areas with no visibility (less than 10%) were associated with some active agricultural fields. No archaeological resources were identified in the archaeological study area. (Jacobs 2023a, page 5.3-24; Jacobs 2023b, Figure 6-5)

Historic Built Environment Survey Methods. An initial architectural survey was conducted August 22–24, 2022. A follow up architectural survey was conducted November 8–9, 2022. Before conducting the survey, records search results and historical aerial images and maps were inspected to identify the locations of potential historic built-environment resources in the survey area. During fieldwork, each of the locations identified by the desktop analysis was visited to determine if historic buildings or structures were present in these areas. Additionally, a windshield survey of the entire architectural study area was completed to ensure that there were no additional historic built-environment resources in the study area that had not be identified by the desktop analysis. (Jacobs 2023a, page 5.3-15.)

High resolution photographs were taken of each property that had buildings or structures at least 45 years old. Field notes were also taken to document the characteristics of each built-environment resource and its current condition. To determine whether the properties might be associated with a historic district, attention was paid to the setting,

level of architectural cohesion, and historic integrity of the area. (Jacobs 2023a, pages 5.3-15 and 5.3-16.)

Results of the Inventory

The inventory of cultural resources in the PAA is the collective result of archival and literature research, discussions with local governments and public interest groups, and field investigations conducted both by staff and the applicant. For the proposed MBGP, these efforts have led to the identification of thirteen extant built-environment cultural resources in the PAA dating to the historic period (45 years of age or older). Descriptions of the resources, staff conclusions regarding historical significance, and recommendations as to whether the resource warrants further consideration under CEQA are presented here.

Staff has identified 24 cultural resources in the PAA:

1. Southeast Lake Cahuilla Active Volcanic Cultural District, consisting of:
    a. Obsidian Butte (P-13-000452, P-13-006638, and Obsidian Butte Lithic Scatter)
    b. CA-IMP-3251H
    c. CA-IMP-3254H
    d. CA-IMP-3255H
    e. CA-IMP-3256H
    f. CA-IMP-3257H
    g. Red Island
        i. P-13-008176
        ii. CA-IMP-3258H
2. P-13-014279 segment (N Lateral)
3. P-13-014278 segment (O Lateral)
4. P-13-018312 (Quarters 7, SBSSNWR)
5. P-13-018706 (Historic refuse scatter and duck-hunting ponds)
6. Segment of Channelized Alamo River and Four Ponds
7. J Lateral
8. K Lateral
9. L Lateral
10. M Lateral
11. N Lateral
12. O Lateral
13. P Lateral

14. Q Lateral

15. Vail Canal System

Southeast Lake Cahuilla Active Volcanic Cultural District

The Southeast Lake Cahuilla Active Volcanic Cultural District (SELCAVCD) is a cultural district with archaeological and ethnographic contributors. Here, the CEC staff documents and evaluates the SELCAVCD as a tribal cultural resource, as defined by CEQA. Numerous sources of information contribute to the establishment of the SELCAVCD as a cultural district and tribal cultural resources. The sources considered are cited throughout this discussion and the reader will find anthropological, historical, geological, biological, and archaeological references among them. Most importantly, this consideration of the SELCAVCD draws from the indigenous knowledge of individuals from three California Native American tribes: the Agua Caliente Band of Cahuilla Indians, Kwaaymii Laguna Band of Mission Indians, and Quechan Indian Tribe.

Boundary Description. The SELCAVD consists of two discontiguous units (**Figure 5.4-2**), Unit A and Unit B. The former contains the five volcanic domes of Obsidian Butte, Rock Hill, Red Island, and Mullet Island; two areas of Mud Volcanoes and Mud Pots (CA-IMP-003256H and The New Mud Pots and Volcanoes); the Pond of Good Water (CA-IMP-3251H); and the Saltwater Pond (CA-IMP-003255). Unit B contains the Mud Volcanoes and Old Mud Pots (CA-IMP-003257H).

Unit A of the SELCAVD encompassed approximately 7,407 acres, and its boundary begins in the northeast corner of Section 11, at the intersection of W. Noffsinger and Davis roads. The district boundary proceeds south along Davis Road to a point at the northeast corner of the southeast ¼ of Section 14 (where Hazard Road intersects Davis Road); from that point, the boundary traverses west along the north margin of the southeast ¼ of the section to the centerline of the section; the boundary then turns south along an unnamed dirt road until that road ends at W. Schrimpf Road (in the center of Section 23). From that point, the boundary then proceeds west along Schrimpf Road until the intersection with Garst Road, at which point the boundary then turns south, following Garst Road for 1.08 miles as it crosses the Alamo River and continues south before intersecting with Hatfield Road. At Hatfield Road the boundary proceeds west for 1.0 mile along an unnamed dirt road following the northern margin of the southern ½ of Section 27 until reaching the western boundary of the section. From that point, the district boundary then proceeds south for 0.5 mile until reaching the southern margin of Section 28 and follows this line west for 0.5 mile until reaching the centerline of Section 33 and then proceeding south for 0.5 mile. Upon reaching the center of Section 33, the boundary then continues west for 0.5 mile. Upon reaching the western margin of Section 33, the district boundary then continues south for 0.5 mile, and then proceeds west for 1.0 mile, following the southern margin of Section 32. Upon reaching southwest corner of Section 32, the cultural district boundary then runs north for 2.0 miles. At the northwest corner of Section 29, the boundary turns east and continues in that direction for 1.0 mile. Upon reaching the southwest corner of Section 21, the boundary then continues northward for 3.0 miles, until reaching the northwest corner of Section 9. From that point, the boundary turns

east, continuing for 3.0 miles, and finally terminating where beginning at the northeast corner of Section 11.

Unit B of the SELCAVD encompasses 27 acres, its boundary begins at the southwest corner of the northeast ¼ of section 24 (the northeast corner of Davis and W. Schrimpf roads). From that point, the boundary proceeds north along Davis Road for 1,440 feet, at which point the boundary then turns east for 520 feet, then south for 140 feet to a point where it turns east for 340 feet, from this point the boundary then turns south and proceeds 1,300 feet until reaching W. Schrimpf Road. Upon reaching W. Schrimpf Road the boundary then turns west, continuing for 860 feet, terminating where beginning at the intersection of W. Schrimpf and Davis roads.

Boundary Justification. The SELCAVD incorporates the main cultural features of the Salton Buttes: Obsidian Butte, Rock Hill, Red Hill, Mullet Island, the sets of mud pots, as well as their physical and visual connectivity, and setting. The boundary shape is drawn from information presented to CEC cultural staff by tribal representatives during the consultation process. The SELCAVD boundary roughly follows the Salton Sea Shallow Geothermal Anomaly, although it is depicted with a smaller footprint. Because the water line for the Salton Sea is not static, the delineation of boundary lines mostly corresponds with United States Geological Survey quadrangle map section and section subdivision lines, which is consistent with the Native American Heritage Commission practices for sacred lands inventory searches. The district was centered on public lands to simplify the property owner notification process, with exception to the inclusion of Unit B, which contains the location of the Mud Pots and Old Mud Volcanoes (CA-IMP-3257-H) as a discontiguous but essential contributing resource to the district. The Salton Sea contributes to the district by creating a visual setting much as Lake Cahuilla did in pre contact times. Future identification of additional contributing and character defining features and buffers from potential incompatible uses, as defined by the perspective of the living traditional community (local tribes), may result in adjustment of boundaries in the future. Given the dynamic nature of this landscape, boundaries also consider fluctuations in the water line of the sea.

SELCAVD Description. The SELCAVCD is part of a larger cultural landscape in and around ancient Lake Cahuilla, including the area in and around its modern expression as The Salton Sea that contains tangible and intangible natural and cultural resources of significant value to Kamia, Cahuilla, and Quechan people. The SELCAVCD is centered upon the surficial expression of the Salton Sea Shallow Geothermal Anomaly and consists of culturally important volcanic and hydrological features, mineral deposits, biotic resources, and places of sacred and ritual importance.

Figure 5.4-2
Boundaries of the Southeast Lake Cahuilla Active Volcanic Cultural District

Source: Carmen Lucas and ASM Affiliates

Within the SELCAVDC, three primary themes have been identified among the resources that, in aggregate, paint a unique characterization of the whole: (1) it is recognized by those with cultural ties to the area as a dynamic and constantly changing landscape; (2) it is a place where materials are sourced; and (3) it connects people to a sacred and temporal whole.

A dynamic and changing landscape: Hydrologic conditions in the Imperial Valley led to the repeated flooding and desiccation of ancient Lake Cahuilla, the result of irregular seasonal overflow from the Colorado River into the Salton Sink through the Alamo and New rivers. This capricious supply of water was not only responsible for the episodic presence and absence of Lake Cahuilla over the millennia, but also heavily influenced the subsistence and habitation patterns of the Kamia year over year. In the ethnohistoric past, after the last desiccation of Lake Cahuilla, the absence of the seasonal flooding of the sloughs pushed the Kamia to periodically relocate along the Colorado River in neighboring Yuma territory.

Ethnohistoric accounts (Patencio 1971, page 18) as well as information shared with CEC staff in consultation with tribal representatives make clear that the district is and was seen as a place that was subject to constant change. Change is apparent within the district in many ways, including the water level in the lake, the dryness of the mud along pathways across the district whereby access is limiting or granted to low-lying areas, by the migrating of mud pots and mud volcanoes along their liniment, the sudden appearance or disappearance of a group of mud pots, and the constant building, collapse, and rebuilding of mud volcanoes.

A place where materials are sourced: Within the SELCAVCD, people extracted resources for personal use or trade, they quarried obsidian, sourced mineral paints used to paint their bodies or decorate ceramic pots, salt and clay was harvested, plants for food, textiles, and medicine for healing were gathered, and people hunted and fished for food.

A shared place where people connect to a sacred and temporal whole: The SELCAVCD is a place of cultural importance to the Kamia, the Quechan, and the Cahuilla people. It is physically and spiritually connected to the viewsheds and landscapes that surround it. Views of the nighttime sky connects people to cultural legends and legendary figures associated with the beginning of the world as they are embodied in the stars. Similarly, terrestrial landscape viewsheds connect people to their cosmology, sacred places (many of which are found in the surrounding mountain ranges and peaks), and each other across the landscape. Creation stories are written on the landscape here and in the stars surrounding the district. The SELCAVCD is a place of teaching and transmission of cultural knowledge, connecting people to each other, their culture, and shared heritage.

Contributing Resources and Elements

Obsidian Butte. Cultural resource managers and anthropologists have recorded archaeological and other cultural characteristics of Obsidian Butte, the southernmost of the Salton Buttes, in a piecemeal manner between 1957 and 2003. As such, Obsidian Butte has three sets of assigned resource numbers in the California Historical Resources Information System (CHRIS): P-13-000452 (CA-IMP-000452), P-13-006638, and Obsidian Butte Lithic Scatter. Gates and Crawford (2010) are the first to holistically describe all cultural aspects of Obsidian Butte but did not prepare a set of Department of Parks and Recreation 523 recordation forms. The present staff assessment combines all previously published observations about Obsidian Butte with information gained during CEC staff's February 2024 site visits.

Obsidian Butte exhibits six obsidian outcroppings among rhyolitic structures. Contemporary observations reveal that rock quarrying and geothermal exploration at Obsidian Butte has disrupted the original form of the rhyolitic structures but spared six obsidian outcroppings. (Schmitt et al. 2019, page 8, Figure 1B.) Sharpe (2003, page 3) reports 10 obsidian domes surrounding the central butte, suggesting that quarrying or other activities destroyed four obsidian outcrops between January 23, 2003, and 2019. One outcropping is 0.07 mile from the closest construction laydown and parking area common to all three proposed geothermal projects. Obsidian Butte is adjacent to construction laydown and parking areas associated with the MBGP and 3.2 miles from the proposed MBGP power plant site itself. The obsidian outcroppings, remaining rhyolitic structures, and recorded scatters of Native American stone tool manufacturing cover about 250 acres (see Lange 2009, page 2).

The Archaeological Survey Association of Southern California (ASA) recorded archaeological site P-13-006638 as a low-density lithic scatter at the southeast corner of Obsidian Butte. The site record form does not remark on the size of the site or map precise site boundaries. The ASA collected two obsidian flakes, a wonderstone, an obsidian hammerstone, and three geologic samples of obsidian from P-13-006638. The ASA curated the collected materials at the Imperial Valley College Museum under the accession number 1991-127. (ASA 1957.)

Romandia (1976) recorded P-13-000452 as a toolstone quarry ("lithic shop") on Obsidian Butte. Lange (2009) updated P-13-000452's resource record form with new mapping and a brief description of Obsidian Butte's geology, importance in the lives of modern and ancient California Native Americans, and the condition of Obsidian Butte at the time of the record update. The updated map identifies all of Obsidian Butte as an archaeological site.

Obsidian from Obsidian Butte occurs at numerous archaeological sites throughout Southern California and parts of the San Joaquin Valley:

- Elk Hills and Buena Vista Lake (CA-KER-000116 and CA-KER-005408)

- Northern Coachella Valley, mountain San Diego County, and coastal San Diego and Orange counties
- Northern Sierra Cucupá mountains, Mexico (Laylander et al. 2016, pages 36 and 40; Shackley 2019, Figures 5–6; Sutton 2008, Tables 2–3; Sutton and des Lauriers 2002, Table 1; Sutton et al. 2016, page 66.)

Sharpe (2003) recorded the Obsidian Butte Lithic Scatter on Department of Parks and Recreation (DPR) 523 forms as a lithic scatter measuring 45 feet by 40 feet. The lithic scatter consisted of one obsidian projectile point preform (nearly completed artifact) and seven obsidian secondary reduction flakes. The DPR 523 form notes that local California Native American tribes used obsidian from Obsidian Butte for tools and that "rock hounds" collect obsidian from the site vicinity.

The CEC staff's February site visits indicate that Rock Hill and Red Island are plainly visible from many points across Obsidian Butte. From the highest point of Obsidian Butte, one can just identify Mullet Island with high magnification. At much greater remove, a person standing on Obsidian Butte can see Centinella Peak or Mount Signal, about 36 miles to the south.

Consultation with tribal representatives indicates that in addition to its use as an obsidian quarry, Obsidian Butte has cultural value as a ceremonial and teaching place and serves as a landmark.

Rock Hill. The rhyolite dome known as Rock Hill or Salton Dome (see Kelley and Soske 1936, Figure 1) is about 1 mile northeast of Obsidian Butte, 0.5 mile from a proposed construction laydown and parking area, and 2.3 miles from the proposed MBGP power plant site. From the top of Rock Hill, Obsidian Butte and Red Hill are clearly visible.

Through consultation with tribal representatives CEC staff was informed that Rock Hill has significant cultural value as a teaching area, a wildlife sanctuary, a landmark, and as a place that maintains metaphysical and visual connections to distant sacred landmarks, including Laguna Mountain, Signal Mountain, Pilot Knob, the Santa Rosa Mountains, and the Chocolate Mountains.

No previously recorded cultural resources are present at Rock Hill.

Red Island. Red Island, also known as Pumice Buttes, consists of two rhyolite domes (Red Island North and Red Island South) that merged to form what looks like a single geologic structure (Kelley and Soske 1936, page 499). As such, Red Island is both the third and fourth of the volcanic domes forming the Salton Buttes. Red Island North is 1.26 miles from the proposed MBGP powerplant site. The Red Island volcanic domes formed at about the same time as Obsidian Butte (about 2450 B.P.) but could be as much as 100 years younger than Obsidian Butte (Jacobs 2023bb, TN 252491-6, page 22; Schmitt et al. 2019, page 17). Red Island South hosts two previously recorded cultural resources: P-13-008176 and CA-IMP-003258H.

P-13-008176 is an exposed outcrop of obsidian on Red Island South. Native American quarrying of the obsidian was evident by artifacts near the outcrop: byproducts of quarrying stone and fashioning tools (obsidian flakes), artifact preforms, and hammerstones. (Pierson n.d.)

The Imperial Valley College Museum (IVCM n.d.f) recorded CA-IMP-003258H based on the General Land Office (GLO) survey map and field notes of 1856. These two historical documents map and describe a group of mud volcanoes. During the CEC staff's February 26, 2024, site visit to CA-IMP-003258H, staff observed a large pile of broken concrete and rebar at the recorded location of the mud volcanoes, which were no longer evident.

Through consultation, CEC staff was informed that Red Island is a culturally significant source for ochre, a mineral pigment that has important cultural applications. Additionally, it was communicated to staff that Red Island is a ceremonial location and teaching place, as well as traditional landmark. During site visits to Red Island on February 9, 2024, and on February 26, 2024, CEC staff were shown two large rocks (Bear Rock and the Rock That Transforms) which were identified as features of some importance to the tribal representatives. During the CEC staff's site visit on February 9, 2024, staff were informed of the presence of several volcanic vents known to tribal representatives on the side of Red Island North.

The Cahuilla referred to Red Island as "Paint Island," likely for the ochre found there (Bean et al. 1991, page 68; Patencio 1971, pages 17–18; Timothy Wilcox, personal communication 2024). The Cahuilla utilized pigments, particularly red, for various ceremonial and social purposes. Red paint, derived from mineral hematite or red algae scum from springs, held significant symbolic value, especially in religious contexts (Bean 2020, pages 275–277). It was associated with the death of the creator god, Mukat, symbolizing his power of creation. The mineral deposits of red pigment were believed to contain the essence of Mukat's power. Paint was used used on pottery, tools, and ceremonial items, and sand paintings. Red, white, and black paint were applied to the face, and body, with specific designs for men and women.

Mullet Island. Mullet Island is the northernmost of the Salton Buttes and is 2.4 miles from the proposed MBGP. "Indian Paint Springs" are near Mullet Island. Iron oxide forms in some of the muds in the mud pots near Mullet Island, which probably accounts for the paint springs moniker. (Kelley and Soske 1936, pages 498–499, Figure 1.)

Wet conditions during the CEC staff's February 2024 field visits precluded access to Mullet Island.

CA-IMP-003251H (Pond of Good Water). The Imperial Valley College Museum (IVCM n.d.a) recorded a pond of good water based on the GLO survey map and field notes of 1856. These two historical documents describe the pond as measuring 7 feet across and 2 feet deep, when Lake Cahuilla was dry. During the CEC staff's February 2024 site visits, approximately 80 percent of the pond's recorded location was

underwater, effectively subsuming the pond. The closest project components to CA-IMP-003251H are construction laydown and parking areas about 0.25 mile away.

CA-IMP-003254H (Salt Deposit). The Imperial Valley College Museum (IVCM n.d.b) recorded a surface deposit of pure salt based on the GLO survey map and field notes of 1856. These two historical documents describe the salt deposit as measuring 33 feet wide from east to west. A note on the archaeological site survey record states that the rising Salton Sea destroyed CA-IMP-003254H. The CEC staff did not attempt to find CA-IMP-003254H during its February 2024 field visits because the closest project components to this low-lying feature are 0.8 mile away.

CA-IMP-003255H (Saltwater Pond). The Imperial Valley College Museum (IVCM n.d.c) recorded CA-IMP-003255H based on the GLO survey map and field notes of 1856, when Lake Cahuilla was dry. These two historical documents map and describe a pond of saltwater measuring 60 feet wide. The saltwater pond is recorded just east of Obsidian Butte and 0.25 mile north of a proposed construction laydown and parking area for the MBGP.

CA-IMP-003256H (Mud Volcanoes). The Imperial Valley College Museum (IVCM n.d.d) recorded CA-IMP-003256H based on the GLO survey map and field notes of 1856, when Lake Cahuilla was dry. These two historical documents map and describe a group of mud volcanoes measuring 594 feet wide. Some of these mud volcanoes are evident on current satellite imagery of CA-IMP-003256H's location. Wet conditions during the CEC staff's February 2024 field visits precluded access to these mud volcanoes. CA-IMP-003256H is 0.5 mile from the closest MBGP project component, which is a geothermal production well pad. Mud volcanoes and pots have been documented on historic maps in the vicinity of CA-IMP-003256H in 1855/1856, 1913, 1917, 1940, and 1953 (Anonymous 1913; Beasley 1890; COE 1952; GLO 1856b, 1917; USGS 1985).

CA-IMP-003257H (Mud Volcanoes/Old Mud Pots). The Imperial Valley College Museum (IVCM n.d.e) recorded CA-IMP-003257H based on the GLO survey map and field notes of 1856. These two historical documents map and describe a group of mud volcanoes measuring 119 feet wide. The CEC staff visited the Old Mud Pots on February 9, 26, and 27, 2024. At these times, the Old Mud Pots covered about 2.4 acres of land northwest of its original recorded location (no mud volcanoes or pots are evident at the original recorded location). As of February 2024, the Old Mud Pots consisted of approximately 30 mud volcanoes and 16 mud pots. Thermal vents in the mud volcanoes threw out mud and emitted steam during the CEC staff field visits. Similarly, staff could see that the mud pots, many of which held water, audibly and visibly bubbled and emitted steam. Noise from the Hudson Ranch Power I's cooling towers made it impossible to hear the Old Mud Pots bubbling from Davis Road, although one could hear the mud pots and volcanoes when the cooling towers were quiet. The Old Mud Pots are less than 500 feet from the MBGP power plant site, 0.56 mile from the nearest proposed borrow pit, and 0.22 mile from the Hudson Ranch Power I's power block. Mud volcanoes and pots have been documented on historic maps in the vicinity of the Old Mud Pots in 1855/1856,

1913, 1917, 1940, and 1953 (Anonymous 1913; Beasley 1890; COE 1952; GLO 1856b, 1917; USGS 1985).

Through consultation with tribal representatives, CEC staff was informed that mud pots and mud volcanoes are important sources of clay, medicine, and minerals. Additionally, it was conveyed to CEC staff that the mud pots and mud volcanoes are teaching places as well as ceremonially important and sacred places where the bubbles rising to the surface of the mud pots are viewed as the heartbeat of Mother Earth, and the steam rising from the vents of the mud volcanoes her breath.

New Mud Pots and Volcanoes. The New Mud Pots and Volcanoes are not recorded at the SCIC, but Carmen Lucas of the Kwaaymii Laguna Band of Mission Indians reported their existence to CEC staff. Current satellite imagery indicates that the New Mud Pots and Volcanoes emerge from standing water over approximately 9.62 acres. Approximately 36 mud pots and 20 mud volcanoes are evident in recent satellite imagery. The New Mud Pots and Volcanoes are 1.3 miles northwest of the proposed MBGP power plant and 1.0 mile from a proposed geothermal production well pad. They are situated between Mullet Island and CA-IMP-003256H (Mud Volcanoes). During the CEC staff's February field visits, the New Mud Pots and Volcanoes were inaccessible because of thick vegetation, deep mud, and standing water. Mud volcanoes and pots have been documented on historic maps in the vicinity of the New Mud Pots and Volcanoes in 1855/1856, 1913, 1917, and 1940 (Anonymous 1913; Beasley 1890; COE 1952; GLO 1856b, 1917).

Evaluation of the SELCAVCD. To evaluate the SELCAVCD as a tribal cultural resource under CEQA, one must establish one or more significance themes that derive from a historic context, ensure that said theme or themes include tribal perspectives on significance, provide a bounded area, define a period of significance, identify significance per at least one of the four criteria, and determine integrity.

The historic context is provided in the following subsections of this analysis: Native American Archaeological and Ethnographic contexts, Native American Consultation, and the preceding description of the SELCAVCD. The contextual themes of the SELCAVD are those of change, resource procurement, and connection. The theme of change is applicable because there exists a continuity of indigenous perspectives regarding the district as a place of constant change, held in the minds of Native peoples from the ethno-historic period to the present. The theme of resource procurement is identified because several resources within the district, primarily obsidian, salt, paint, and clay, are obtainable within the district and are shown as a constant theme within the district throughout time, as witnessed by the archaeological record, ethnographic literature, and continued today by contemporary native populations. Lastly, the theme of connection is inherent within the SELCAVCD as it is a place where contemporary native people learn and transmit cultural knowledge, connect with cultural legends and legendary figures from their origin stories, and directly experience the presence of powerful spiritual entities.

Periods of significance have beginning and ending dates. The beginning date for this traditional cultural place is indeterminate because there is little knowledge of how early the place was used or occupied. Native Americans understand that this resource has been used forever, since time immemorial. There is no end date for the period of significance for the SELCAVCD because it is still used and held sacred by the Kwaaymii Laguna, Aqua Caliente Band of Cahuilla Indians, and the Fort Yuma Quechan Indian Tribe.

Staff recommends that the SELCAVCD is eligible for the California Register of Historical Resources (CRHR) under Criterion 1 at the local and state level for the unique historic events that contribute to Native American understandings of their origins, in addition to the extraction of resources and ceremonies which occurred, and ceremonies that still occur at the SELCAVCD.

Staff recommends that the SELCAVCD is eligible for the CRHR under Criterion 2 at the local and regional level for the association of the mud pots and mud volcanoes with the spiritual entity Mother Earth, who contemporary Native Americans believe is represented in the surface expressions of the mud pots and mud volcanoes contained in the SELCAVCD.

Staff recommends that the SELCAVCD is also eligible for the CRHR under Criterion 4 at the local, state, and national level for the information concerning obsidian quarried from Obsidian Butte, its procurement, lithic reduction, trade, geographic and temporal distribution, hydration and geochemical studies that the resource has already yielded, but also for the potential of the place to yield additional ethnographic and archaeological information about the obsidian source, and cultural lifeways in the Imperial Valley, and trade with the greater Southwest.

The integrity of the SELCAVCD has been compromised by the historic activities associated with farming and irrigation, geothermal drilling, gravel mining, soil and construction debris dumping, infrastructure constriction such as roads and trails, and development associated with a county park, and a trailer park. However, despite the intrusions to this tribal cultural resource, the SELCAVCD continues to convey a valuable and important sense of place to the Kamia, Quechan, and Cahuilla who continue to visit and celebrate at this significant place. Therefore, the SELCAVCD maintains integrity of location, materials, feeling, and association. As such, CEC staff recommends that the CEC find that the SELCAVCD is a tribal cultural resource for the purposes of CEQA.

Historic Archaeological and Built Environment Resources

P-13-018706 (Historic Refuse Scatter and Duck-hunting Ponds). P-13-018706 (CA-IMP-013449/Temporary No. 21268-002) consists of a historic refuse scatter and duck-hunting ponds. Construction of the proposed project would damage P-13-018706 through installation of pipelines, well pads, and geothermal wells (Jacobs 2023kk, Figure 2-7aR). P-13-018706 exhibits two separate periods of use. The first period of us was between 1910 and 1940. The second period of use likely began between the 1950s and

1970s, and extended through 2010, when the duck ponds were fully abandoned. (Chambers 2021, page 4.3-11; Pentney et al. 2021, page 21.)

The first occupation likely occurred between the 1910s and 1940s, based on the dates obtained from the maker's marks on intact glass jars. An intact, cobalt blue Vick's VapoRub jar with two triangles on the base was observed in the southeast corner of the easternmost duck pond and dates to the 1910s to the 1930s. A colorless Chesebrough Vaseline jar fragment was also in the same vicinity with a date range of 1918–1938, which is based on the visible embossing on the side of the jar. Ceramic houseware fragments, a porcelain insulator, small unidentifiable metal fragments, and other glass shards also were present. (Pentney et al. 2021, page 21.)

The second period of use began between the 1950s and 1976, based on topographic maps and aerial photography, and extends up until 2010 when the duck ponds were abandoned. Additionally, the presence of the historic-period trash scatter in the soils of the duck ponds indicates that the area was disturbed at least post-1950s. This second period of use consists of the construction and use of ponds with multiple blinds for duck hunting. The duck ponds were excavated at the earliest in the late 1950s, as they are not evident on a 1953 aerial photograph but are visible on a 1976 aerial photograph of the area (Pentney et al. 2021, page 21, Figures 6–7). Aerial photographs dating from 1976 to 2009 indicate that the duck ponds extended from McDonald Road south toward Schrimpf Road (GS Lyon 2019, Appendix C, Plates 8–12). Construction of the Hudson Ranch Geothermal I power plant, completed in March 2012, destroyed the northern half of the duck ponds (Ecology and Environment 2012b, page 2-2; GS Lyon 2019, Appendix C, Plate 13). Each duck pond, separated by a berm approximately 12 feet wide and 4 feet high, is 400 feet wide and 1,177 feet long. (Pentney et al. 2021, pages 21–22.)

Evaluation of P-13-018706. Chambers (2021, page 4.3-11) recommended that P-13-018706 is not a significant cultural resource for CEQA purposes. The County of Imperial agreed with this recommendation (IVPC 2021, page 7). The CEC staff recommends, therefore, that P-13-018706 is not a historical or unique archaeological resource for the purposes of CEQA.

P-13-018312 (Quarters 7, Sonny Bono Salton Sea National Wildlife Refuge). P-13-018312, known as Quarters 7, is a historic-period building at 906 West Sinclair Road. It is associated with the Sonny Bono Salton Sea National Wildlife Refuge (SBSSNWR), established in 1930. Quarters 7 was built in 1951 to meet the increased staffing needs of the refuge. The building is a single-story, minimalist ranch style housing building with a rectangular plan on a parcel with several other refuge buildings and structures. Quarters 7 has three bedrooms, two bathrooms, a kitchen, a living room, an attached converted garage, an outdoor patio area, and a broad hipped roof with overhanging eaves and rooftop solar on the south side of the roof. Vernon Acker, a United States Fish and Wildlife Service (USFWS) architect, designed Quarters 7. The wildlife refuge's headquarters was moved to the location of Quarters 7 to create a new headquarters in the mid-1960s. Quarters 7 is the only building associated with that portion of the wildlife refuge's history and is the only building over 50 years old on the property. The building has undergone

significant alterations since in the last 45 years, including changes to significant design components like the windows, replacing the shingle roof with a standing-seam metal roof, and multiple changes to the patio. Both the applicant's consultant and the CEC staff verified the current condition of Quarters 7. The applicant's consultant noted several alterations since its original recordation in 2021, including that the shiplap siding had been replaced with stucco and that new vinyl and aluminum windows have been installed. (Jacobs 2023b, Appendix 5.3A-E2.) The CEC staff noted that a fence, tree and brush screening, and various buildings and structures on the property completely enclosed the residence.

Quarters 7 Evaluation. Quarters 7 was previously evaluated using the National Register of Historic Places (NRHP) criteria by the USFWS in 2021. The applicant's consultant, PaleoWest, did not evaluate the building, and instead relied on the USFWS evaluation, which was determined not eligible for the NRHP because the building had been critically altered, ensuring that its exemplary architecture could no longer convey its significance. Additionally, the USFWS found that even if it did meet any of the eligibility criteria, it still would not be eligible because of the significant alterations to the buildings dating to the last 40 years (Jacobs 2023b, Appendices 5.3A-E1 and 5.3A-E2).

Quarters 7, built in 1951, was designed by the architect Vernon Acker, under the employ of USFWS's Region 1, Portland, Oregon, Engineering office. This was one of eleven known built single-family residences designed by Vernon Acker between 1949 and 1959. At least five other buildings designed by Vernon Acker have been evaluated for under NRHP eligibility criteria, and only the Willard National Fish Hatchery residence was determined eligible for the NRHP (Jacobs 2023b, Appendix 5.3A-E2).

Quarters 7, like many residential buildings constructed by the government in the 1950s, is a simple, compact ranch-style building with minimalist design elements that required relatively little funding. This reflects then-prevailing attitudes towards government housing to meet increased demand in the post-war period. However, Quarter's 7 architecture also includes several additional design elements like chimney details, planters, the window configuration, a rear patio and ramada entry covering the entry that provide a break from the otherwise sternly minimalist architecture.

Quarters 7 was built in 1951 to meet the housing needs of the SBSSNWR, which was originally established in 1930 (under a different name). Originally, Quarter 7 was the only building in this property, until the mid-1960s, when the wildlife refuge relocated its headquarters to this location. This remains the refuge's headquarters today, but all the other buildings associated with the original headquarters at this location have since been replaced. As such, Quarters 7 does not reflect a close or significant association with either the establishment of the SBSSNWR or any other known significant events or patterns in history, and therefore does not meet the requirements of Criterion 1 of the CRHR. The designer of Quarters 7, Vernon Acker, is not a recognized as a significant historical figure, and no known significant people or significant groups of people are known to be associated with the Quarters 7 building and therefore does not meet the requirements of CRHR Criterion 2. As originally built, Quarters 7 is an excellent example of the minimalist

ranch style with several outdoor living design elements incorporated into its construction, however, the building has since been significantly altered, especially many of the building's signature elements including the windows, which have been replaced with aluminum or vinyl sliders, the roofing material, the outdoor patio, and the original interior finishes, and the kitchen floor plan. These changes have greatly altered the original design and construction of the building and significantly impacted the integrity of design, materials, and workmanship. Furthermore, since the rest of the property was relatively undeveloped for the first decade of Quarters 7's history, and since the property has been further redeveloped with every other building on the property dating to the 1980s or later, the integrity of setting and feeling have also been compromised. Therefore, the building does not satisfy the requirements for listing in the CRHR under Criterion 3. Quarters 7 does not have any potential to yield any previously unknown information, and therefore is not eligible under Criterion 4 (Jacobs 2023b, Appendix 5.3A-E2).

Segment of Channelized Alamo River and Four Ponds. The Alamo River is 52 miles long and flows west and north from the Mexicali Valley in Baja California, draining into the Salton Sea. Before the twentieth century, the Alamo River acted a natural overflow channel for the Colorado River and drained into the historic Lake Cahuilla. In 1900, the California Development Company built a canal intake and headgates at Pilot Knob to divert water from the Colorado River. The Alamo Canal begins at this location and continues to the international boundary and into Mexico for 4–5 miles before it turns west for 2–3 miles, where it connects with the old Alamo River channel. When the Colorado River flooded in 1905, the water spilled into the Alamo Canal and overflowed the banks of the Old Alamo River channel and swept through the Imperial Valley. The flooding continued until 1907 when engineers finally plugged the breach. However, by then the floodwaters had already created the present-day Salton Sea. During this event, the rushing water deepened the Alamo River channel up to 20–30 feet in some places. (Dowd 1956, pages 17, 32–35.)

The Alamo River is a major outlet for the extensive drainage systems constructed by the Imperial Irrigation District (IID) in the Imperial Valley. In the first half of the twentieth century, the IID initiated several infrastructure projects that improved the flow and drainage of the Alamo River. One of these improvements was the creation of a new outlet for the Alamo River into the Salton Sea, and an associated 3,700-foot-long levee to prevent flooding of adjacent land in 1927. In 1949, the IID began channelizing portions of the Alamo River as part of the North End Improvement Plan to improve drainage and agricultural productivity in the Vail Canal System. This involved dredging a new river channel that eliminated bends in the river and constructing new levees. The associated ponds appear to be the result of channelization because they are in the location where bends in the river were eliminated during dredging of the river. (IID 1927, page 21; IID 1950, page 35; Schaefer et al. 2010, page 29.)

The channelization of the Alamo River by the IID improved the Vail Canal System and the agricultural activity in the area. The creation of the channelized portion of the Alamo River is associated with the continued development of irrigation infrastructure and canal

systems in the Imperial Valley, but these activities occurred long after the Vail Canal System, which it improved. Therefore, this resource cannot be linked to any specific events that made a significant contribution to the broad patterns of history. The Channelized Segment of Alamo River and Ponds were created by the IID and cannot be directly associated with a specific individual or group of individuals in a significant manner and therefore does not meet the CRHR Criterion 2. The Channelized Segment of Alamo River and Ponds are simple in design and construction. They are also primarily utilitarian structures and whose construction does not display any distinctive architectural elements, or any innovative designs or building techniques. As such this resource does not meet CRHR Criterion 3. The Channelized Segment of Alamo River and Ponds does not have any potential to yield any previously unknown information, and therefore is not eligible under Criterion 4. (Schaefer et al. 2010, page 29.)

P-13-014279 Segment (N Lateral). P-13-014276 was previously recorded as the 1-mile-long drain associated with N Lateral that runs parallel to West Schrimpf Road. N Lateral is a resource consisting of an 8.9-mile-long irrigation canal and associated drain running along an east-west axis on both sides of West Schrimpf Road. It is part of a larger irrigation system originating from the East Highline Canal Reach 2, which was constructed in 1914. N Lateral is an open canal that is variably lined with concrete or dirt. It is a trapezoidal-shaped channel with a top width of approximately 8–10 feet, a bottom width of approximately 2 feet, and a depth of approximately 4 feet. "1980" is stamped onto concrete-lined portions of the lateral indicating the year the channel was lined. The lateral has numerous checks and drops consisting of a single gate with one chute and cement walls operated by a jack-type lifting mechanism sitting on a wooden cross beam. The checks and drops have curved cement headwalls on the upstream side and straight cement headwalls on the downstream side (Dowd 1956, page 47; Jacobs 2023b, Appendices 5.3A-E1 and 5.3A-E2).

The dirt-lined drain running parallel to the lateral that measures approximately 8 feet in width at the top and up to 4 feet in width at its base, with depths from 6–8 feet. The drain is associated with the lateral but postdates its construction. While its exact date cannot be ascertained, it was likely constructed in the late 1920s or 1930s (Dowd 1956, pages 70–71; Jacobs 2023b, Appendix 5.3A-E1).

P-13-014278 Segment (O Lateral). P-13-014278, also known as O Lateral, is a previously recorded resource consisting of a 7.3-mile-long irrigation canal and associated drain running along an east-west axis on both sides of McDonald Road. It is part of a larger irrigation system originating from the East Highline Canal Reach 2, which was constructed in 1914. O Lateral is an open canal that is variably lined with concrete or dirt. It is a trapezoidal-shaped channel with a top width of approximately 8–10 feet, a bottom width of approximately 2 feet, and a depth of approximately 4 feet. "1981" and "2011" are stamped onto concrete-lined portions of the lateral indicating the years the channel was lined. The lateral has numerous checks and drops consisting of a single gate with one chute and cement walls operated by a jack-type lifting mechanism sitting on a wooden cross beam. The checks and drops have curved cement headwalls on the

upstream side and straight cement headwalls on the downstream side (Dowd 1956, page 47; Jacobs 2023b, Appendices 5.3A-E1 and 5.3A-E2).

Running parallel to the lateral is a dirt-lined drain that measures approximately 8 feet in width at the top and up to 4 feet in width at its base, with depths from 6–8 feet. The drain is associated with the lateral but postdates its construction. While its exact date cannot be ascertained, it was likely constructed in the late 1920s or 1930s (Dowd 1956, pages 70–71; Jacobs 2023b, Appendix 5.3A-E1).

J Lateral. J Lateral is a resource consisting of a 9.5-mile-long irrigation canal and associated drain running along an east-west axis on both sides of East Hoober Road. It is part of a larger irrigation system originating from the East Highline Canal Reach 2, which was constructed 1914. J Lateral is an open canal that is variably lined with concrete or dirt. It is a trapezoidal-shaped channel with a top width of approximately 8–10 feet, a bottom width of approximately 2 feet, and a depth of approximately 4 feet. "1963" is stamped onto concrete lined portions of the lateral indicating the year the channel was lined. The lateral has numerous checks and drops consisting of a single gate with one chute and cement walls operated by a jack-type lifting mechanism sitting on a wooden cross beam. The checks and drops have curved cement headwalls on the upstream side and straight cement headwalls on the downstream side (Dowd 1956, page 47; Jacobs 2023b, Appendix 5.3A-E1).

Running parallel to the lateral is a dirt-lined drain that measures approximately 8 feet in width at the top and up to 4 feet in width at its base, with depths from 6 to 8 feet. The drain is associated with the lateral but postdates its construction. While its exact date cannot be ascertained, it was likely constructed in the late 1920s or 1930s (Dowd 1956, pages 70–71; Jacobs 2023b, Appendix 5.3A-E1).

K Lateral. K Lateral is a resource consisting of a 6.1-mile-long irrigation canal and associated drain running along an east-west axis on both sides of Sinclair Road. It is part of a larger irrigation system originating from the East Highline Canal Reach 2, which was constructed circa 1914. K Lateral is an open canal that is variably lined with concrete or dirt. It is a trapezoidal-shaped channel with a top width of approximately 8–10 feet, a bottom width of approximately 2 feet, and a depth of approximately 4 feet. The lateral has numerous checks and drops consisting of a single gate with one chute and cement walls operated by a jack-type lifting mechanism sitting on a wooden cross beam. The checks and drops have curved cement headwalls on the upstream side and straight cement headwalls on the downstream side (Dowd 1956, page 47; Jacobs 2023b, Appendix 5.3A-E1).

Running parallel for approximately half of the lateral is a dirt-lined drain that measures approximately 8 feet in width at the top, and up to 4 feet in width at its base and depths from 6–8 feet. The drain is associated with the lateral but postdates its construction. While its exact date cannot be ascertained, it was likely constructed in the late 1920s or 1930s (Dowd 1956, pages 70–71; Jacobs 2023b, Appendix 5.3A-E1).

L Lateral. L Lateral is a resource consisting of a 9.2-mile-long irrigation canal and associated drain running along an east-west axis on both sides of Merkley Road. It is part of a larger irrigation system originating from the East Highline Canal Reach 2, which was constructed ca. 1914. L Lateral is an open canal that is variably lined with concrete or dirt. It is a trapezoidal-shaped channel with a top width of approximately 8–10 feet, a bottom width of approximately 2 feet, and a depth of approximately 4 feet. "1969" is stamped onto concrete lined portions of the lateral indicating the year the channel was lined. The lateral has numerous checks and drops consisting of a single gate with one chute and cement walls operated by a jack-type lifting mechanism sitting on a wooden cross beam. The checks and drops have curved cement headwalls on the upstream side and straight cement headwalls on the downstream side (Dowd 1956, page 47; Jacobs 2023b, Appendix 5.3A-E1).

Running parallel to the lateral is a dirt-lined drain that measures approximately 8 feet in width at the top, and up to 4 feet in width at its base and depths from 6–8 feet. The drain is associated with the lateral but postdates its construction. While its exact date cannot be ascertained, it was likely constructed in the late 1920s or 1930s (Dowd 1956, pages 70–71; Jacobs 2023b, Appendix 5.3A-E1).

M Lateral. M Lateral is a resource consisting of a 9.2-mile-long irrigation canal and associated drain running along an east-west axis on both sides of Simpson Road. It is part of a larger irrigation system originating from the East Highline Canal Reach 2, which was constructed circa 1914. M Lateral is an open canal that is variably lined with concrete or dirt. It is a trapezoidal-shaped channel with a top width of approximately 8–10 feet, a bottom width of approximately 2 feet, and a depth of approximately 4 feet. "1973" is stamped onto concrete lined portions of the lateral indicating the year the channel was lined. The lateral has numerous checks and drops consisting of a single gate with one chute and cement walls operated by a jack-type lifting mechanism sitting on a wooden cross beam. The checks and drops have curved cement headwalls on the upstream side and straight cement headwalls on the downstream side (Dowd 1956, page 47; Jacobs 2023b, Appendix 5.3A-E1).

Running parallel to the lateral is a dirt-lined drain that measures approximately 8 feet in width at the top, and up to 4 feet in width at its base and depths from 6–8 feet. The drain is associated with the lateral but postdates its construction. While its exact date cannot be ascertained, it was likely constructed in the late 1920s or 1930s (Dowd 1956, pages 70–71; Jacobs 2023b, Appendix 5.3A-E1).

P Lateral. P Lateral is a resource consisting of a 7.8-mile-long irrigation canal and associated drain running along an east-west axis on both sides of Hazard Road. It is part of a larger irrigation system originating from the East Highline Canal Reach 2, which was constructed circa 1914. P Lateral is an open canal that is variably lined with concrete or dirt. It is a trapezoidal-shaped channel with a top width of approximately 8–10 feet, a bottom width of approximately 2 feet, and a depth of approximately 4 feet. The lateral has numerous checks and drops consisting of a single gate with one chute and cement walls operated by a jack-type lifting mechanism sitting on a wooden cross beam. The

checks and drops have curved cement headwalls on the upstream side and straight cement headwalls on the downstream side (Dowd 1956, page 47; Jacobs 2023b, Appendix 5.3A-E1).

Running parallel to the lateral is a dirt-lined drain that measures approximately 8 feet wide at the top, and up to 4 feet in width at its base and depths from 6–8 feet. The drain is associated with the lateral but postdates its construction. While its exact date cannot be ascertained, it was likely constructed in the late 1920s or 1930s (Dowd 1956, pages 70–71; Jacobs 2023b, Appendix 5.3A-E1).

Q Lateral. Q Lateral is a resource consisting of a 6.8-mile-long irrigation canal and associated drain running along an east-west axis on both sides of Pound Road. It is part of a larger irrigation system originating from the East Highline Canal Reach 2, which was constructed ca. 1914. Q Lateral is an open canal that is variably lined with concrete or dirt. It is a trapezoidal-shaped channel with a top width of approximately 8–10 feet, a bottom width of approximately 2 feet, and a depth of approximately 4 feet. "1973" is stamped onto concrete lined portions of the lateral indicating the year the channel was lined. The lateral has numerous checks and drops consisting of a single gate with one chute and cement walls operated by a jack-type lifting mechanism sitting on a wooden cross beam. The checks and drops have curved cement headwalls on the upstream side and straight cement headwalls on the downstream side (Dowd 1956, page 47; Jacobs 2023b, Appendix 5.3A-E1).

Running parallel to the lateral is a dirt-lined drain that measures approximately 8 feet wide at the top, and up to 4 feet in width at its base and depths from 6–8 feet. The drain is associated with the lateral but postdates its construction. While its exact date cannot be ascertained, it was likely constructed in the late 1920s or 1930s (Dowd 1956, pages 70–71; Jacobs 2023b, Appendix 5.3A-E1).

N–Q Lateral Evaluations. A number of laterals were previously evaluated for eligibility for the NRHP, and all laterals in the project's built environment project area of analysis (PAA) were previously evaluated by the applicant's consultants for the CRHR. Both evaluations recommended that the laterals be considered ineligible for listing. The following evaluation applies to all lateral segments within the project's built environment PAA (Jacobs 2023b, Appendices 5.3A-E1 and 5.3A-E2).

The laterals are part of an irrigation distribution system associated with the IID's East Highline Canal Reach 2 system, a canal system originally constructed about 1914, after the IID's 1911 formation following the bankruptcy of the California Development Company. The East Highline canal is one of three major distribution canals built to service the different regions within the Imperial Valley. The East Highline Canal delivers irrigable water to IID areas east of the Alamo River and is made up of two reaches running from the Alamo Canal at the Laurence Heading in Mexico north to Niland. After it was constructed in 1914, a network of irrigation lateral canals was constructed at 0.5-mile intervals, the standard length of the agricultural parcels in this region. The laterals are

part of this network of lateral canals (Dowd 1956, pages 47, 71; Schaefer et al. 2010, page 26).

ASM Affiliates recorded segments of Lateral N and Lateral O in 2010 and evaluated those laterals using NRHP criteria. ASM Affiliates recommended both laterals as ineligible for listing in the NRHP and stated that even if the lateral segments were eligible, the canal would not retain integrity due to the significant alterations made to the canals and their associated infrastructure. (Jacobs 2023b, Appendix 5.3A-E2). The applicant's consultant, PaleoWest, evaluated all associated laterals in the project's PAA using the CRHR criteria and concluded that, while the construction of the East Highline Canal and its associated laterals can be considered an important event in the early twentieth-century settlement of the Imperial Valley, the laterals in the project's PAA do not retain enough integrity to convey this significance due to the extensive alterations to this resource including the concrete lining of the lateral and drain outlets, and the replacement of gates and other hardware along the resource (Jacobs 2023b, Appendix 5.3A-E1). Staff also concludes that these laterals are ineligible for listing in the CRHR.

The East Highline Canal and its associated laterals brought irrigable water to agricultural fields in this portion of the Imperial Valley and played a significant role in the region's early agricultural development. The canal systems built by the IID in the early twentieth century significantly increased the agricultural productivity of the Imperial Valley. Because it is directly associated with this significant event that has made a significant association with the broad patterns of local history, and therefore meets CRHR Criterion 1. The laterals were created by the IID and cannot be directly associated with a specific individual or group of individuals in a significant manner and therefore does not meet the CRHR Criterion 2. The laterals are simple in design and construction. They are also primarily utilitarian structure, and their construction does not display any distinctive architectural elements, any innovative designs, or special building techniques. As such the laterals do not meet CRHR Criterion 3. The laterals do not have any potential to yield any previously unknown information, and therefore are not eligible under Criterion 4.

While the laterals meet CRHR eligibility Criterion 1, they do not retain sufficient integrity to convey its significance. The laterals' alignment and location have not changed since their original construction and as such, retains integrity of location. Parts of the surrounding area have been developed for industrial purposes, but the laterals are still largely adjacent to and within view of agricultural fields, preserving integrity of setting and feeling. However, the laterals have undergone extensive and significant alterations including lining large portions of the laterals and associated drains with concrete and the replacement and improvement of gates and hardware creating. These changes compromise the resource's integrity of design, workmanship, and materials. For purely utilitarian structures such as these, design, workmanship, and materials are particularly important aspects of integrity to convey their significance. Because of the significant impacts to the design, workmanship, and materials from these alterations, the laterals is no longer able to convey its significance under Criterion 1. Based on these findings, staff recommends this resource to be considered ineligible for the CRHR.

Vail Canal System. The Vail Canal System is a resource consisting of a supply canal and a network of laterals and drains that provide irrigable water from the East Highline Canal Reach 2 to the areas southeast of the Salton Sea. This system provides irrigation to more than 25,000 acres of land west of the Alamo River and north of the New River. The Kakoo Singh Reservoir to the east supplies the water to the Vail Canal System through the Vail Supply Canal. The supply canal begins at the at the reservoir, travels westward alongside East Albright Road for 10.5 miles before crossing the Alamo River at the North End Dam, and continues until reaching New River 7 miles westward (IID n.d.a; IID 1950, page 35).

The Vail Supply Canal is an open, concrete-lined, trapezoidal shaped structure approximately 20 feet wide with an unknown depth. A series of concrete-reinforced siphons, drop structures, canal checks, and other miscellaneous structures lies along its course. Ten laterals (Vail Laterals 1, 2, 2-A, 3, 3-A, 4, 4-A, 5, 6, and 7) receive water from the supply canal. These laterals begin west of the Alamo River and travel north. They range from 2.4 to 5.5 miles in length and are made up of 0.5-mile-long segments reflecting the distance between roads in the rural landscape. The laterals were originally dirt-lined; however, all but Lateral 6 have since been lined with concrete during modifications in the second half of the twentieth century. The laterals are trapezoidal in shape with top widths varying from approximately 8 to 10 feet, bottom widths of approximately 2 feet, and depths of approximately 4 feet. There are checks and drops on the laterals which consist of single gates operated with a jack-type lifting mechanism resting on a wooden cross beam (Jacobs 2023b, page 57–58, Appendix 5.3A-E1).

There are associated dirt-lined drains parallel to most of the laterals that move wastewater from irrigated fields. The drains are approximately 8 feet wide at the top, up to 4 feet wide at the bottom, and 6–8 feet deep. The lateral drains empty into several larger drainages that flow into the Salton Sea, including the Vail Cut Off Drain and Pumice Drain, or drain directly into the Salton Sea or Alamo River (Jacobs 2023b, Appendix 5.3A-E1).

While the exact date of construction for the Vail Canal System is unknown, it was likely built in the first half of the twentieth century, soon after the completion of the East Highline Canal Reach 2.

Several modifications have been made to the Vail Canal since its construction. The drainage for the canal was constructed in the late 1920s or 1930s, and many of the water facilities in the canal system, including siphons, drop structures, canal checks, and various other structures, were updated to increase the distribution capacity of the canal system in the late 1940s. Furthermore, several concrete structures documented along the laterals exhibit contractor's stamps dating to the 1990s and 2000s, indicating more recent upgrades and improvements to the canal system (Dowd 1956, pages 70–71; IID 1950, page 35; Jacobs 2023b, page 58, Appendix 5.3A-E1).

Evaluation of the Vail Canal System. The Vail Canal System is part of an irrigation distribution system associated with the IID's East Highline Canal Reach 2 system, a canal system originally constructed ca. 1914, shortly after IID's formation in 1911 following the

bankruptcy of the California Development Company. The East Highline canal is one of three major distribution canals built to service the different regions within the Imperial Valley. The East Highline Canal delivers irrigable water to IID areas east of the Alamo River and is made up of two reaches running from the Alamo Canal at the Laurence Heading in Mexico north to Niland. After it was constructed in ca. 1914, a network of irrigation lateral canals was constructed at 0.5-mile intervals, the standard length of the agricultural parcels in this region. The Vail Canal System is part of this network of lateral canals (Dowd 1956, pages 47, 71; Schaefer et al. 2010, page 26).

The applicant's consultant evaluated this lateral using the CRHR criteria, concluding that, while the construction of the East Highline Canal and its associated laterals can be considered an important event in the early twentieth-century settlement of the Imperial Valley, it does not retain enough integrity to convey this significance due to the extensive alterations to this resource including the concrete lining of the lateral and drain outlets, and the replacement of gates and other hardware along the resource (Jacobs 2023b, Appendix 5.3A-E1).

The East Highline Canal and its associated laterals, including the Vail Canal System, brought irrigable water to agricultural fields in this portion of the Imperial Valley and played a significant role in the region's early agricultural development. The canal systems built by the IID in the early twentieth century significantly increased the agricultural productivity of the Imperial Valley. Because it is directly associated with this significant event that have made a significant association with the broad patterns of local history, and therefore meets CRHR Criterion 1. It is unclear whether the Vail Canal System was built by the Vail family, or if it was constructed by the IID. Regardless, there is no known significant association between this resource and a significant individual or group of people, and therefore the Vail Canal System does not meet CRHR Criterion 2. The Vail Canal System is simple in design and construction. It is also primarily a utilitarian structure, and its construction does not display any distinctive architectural elements, or any innovative designs or building techniques. As such the Vail Canal System does not meet CRHR Criterion 3. The Vail Canal System does not have any potential to yield any previously unknown information, and therefore is not eligible under Criterion 4.

While the Vail Canal System meets CRHR Criterion 1, it does not retain sufficient integrity to convey its significance. The lateral's alignment and location has not changed since its original construction and as such, retains integrity of location. Parts of the surrounding area have been developed for industrial purposes, but the lateral is still largely adjacent to and within view of agricultural fields causing it to retain integrity of setting and feeling. However, the Vail Canal System has undergone extensive and significant alterations including lining large portions the lateral and associated drain with concrete and the replacement and improvement of gates and hardware creating significant impacts to the resource's integrity of design, workmanship, and materials. For a purely utilitarian structure such as this; design, workmanship, and materials are particularly important aspects of integrity to convey its significance. Because of the significant impacts to the design, workmanship, and materials from these alterations, the Vail Canal System is no

longer able to convey its significance under Criterion 1. Staff recommends this resource as ineligible for the CRHR.

Interpretation of Results: Archaeological Resources. The proposed Morton Bay Geothermal Project (MBGP) has low sensitivity for the presence of Native American archaeological resources on today's ground surface. A few factors contribute to the low surface sensitivity of the proposed project. First, the Colorado River periodically broke through the delta alluvial fan that separates the Salton Trough from the Gulf of California, inundating the Salton Trough with river water and forming Lake Cahuilla. The proposed MBGP is squarely in the path of these waters, so that archaeological resources on the ground surface were subjected to scouring when water flows were fast, and burial under fine silts in clay when lake-filling episodes occurred more slowly. The CEC's confidential Cultural Resources Unit Inventory System only has record of seven Native American archaeological resources and five ethnographic resources in an area extending from the PAA south to the border with Mexico. This corridor, nine to 20 miles wide and 35 miles long, marks the course of the periodically diverted Colorado River along the New and Alamo rivers. In addition to scouring and burial caused by flooding, this landform is extremely fertile and has been under large-scale agricultural production for more than a century. Grading, crop-raising, and irrigation of these lands could have destroyed or obscured archaeological resources on the ground surface. (Franklin and Carrico 1981, page 4; Welch 1984, page 18.)

The application for certification (AFC) hypothesized that the archaeological PAA has moderate potential to contain Native American archaeological resources below the ground surface. The applicant did not identify any Native American cultural resources within its "Project study area." The applicant concluded that the paucity of available freshwater sources in the MBGP vicinity, low density of known Native American archaeological sites in the immediate area, and the presence of extensive farmlands suggests moderate sensitivity of the Project area for containing intact, buried Native American archaeological resources. (Jacobs 2023b, page 64.) The CEC staff agrees that the potential for construction of the proposed MBGP to encounter buried Native American archaeological resources is at least moderate because the processes responsible for filling Lake Cahuilla deposited fine silt and clay throughout the project area, creating the conditions that can bury archaeological materials (Ecology & Environment 2012b, pages 4.5-6 and 4.5-16; Schaefer 2007, pages 3–4; Welch 1984, page 12).

Naturally occurring soils and sediments have variable potential to contain archaeological materials, hinging principally on four factors:

- The age of the sediments concerned
- Whether humans were likely or known to have inhabited the area concerned
- The manner in which naturally occurring soils and sediments accumulated in the area of study
- What disturbances might have occurred after any archaeological resources were deposited. (Meyer et al. 2009, page 3; Schiffer 1987, pages 250–251.)

The following paragraphs will demonstrate that the archaeological PAA possesses characteristics favorable to both the presence and preservation of buried archaeological resources.

The soils and sediments beneath the archaeological PAA developed in Holocene Epoch (up to about 11,000 years old) and are up to 100 feet thick (Jacobs 2023a, page 5.4-5, Figure 5.4-2). This age coincides with span of human occupation of the Colorado Desert and therefore is the right age to contain archaeological resources.

The project site also meets the second criterion for buried archaeological resource potential because it is situated in an area that was desirable for human habitation. As documented in the Native America Archaeological and Ethnographic settings of this staff analysis, California Native Americans tribes have occupied the margins of Lake Cahuilla when it was present and used other resources in the area when the lake was dry, leaving hundreds of tribal cultural and archaeological resources on the landscape (Apple 1997, page 7).

The soil characteristics in the PAA suggest that the project's underlying soils possess the potential to preserve any buried archaeological materials that are present. The proposed MBGP intersects soils classified as fluvaquents, silty clay, silty clay loam, and very fine sandy loam. Geotechnical borings excavated on the project site reveal alternating layers of clay, silt, and sand, all fine-grained lake deposits from Lake Cahuilla and the present-day Salton Sea. (Jacobs 2023a, page 5.4-5, 5.4-6.) Fine-textured sediments, such as clay and silt, are associated with overbank flooding and subsequent settlement of fine particles suspended in floodwaters. Suspended, fine particles are deposited as floodwaters lose energy or flow, and therefore represent environments or locations where archaeological resources existing at the time of flooding could be capped and preserved for future discovery. Archaeologists regard deposits of fine particles (silt and clay) as possessing greater archaeological preservation potential than coarse deposits (sand and gravel) (Waters 1992, pages 120–122, Figures 3.4, 3.5.)

Interpretation of Results: Historic Built Environment.

No CRHR-eligible cultural resources have been identified in the PAA.

Staff concurs with the applicant's recommendation that none of the resources identified in the PAA appear eligible for the CRHR, nor do any appear eligible to qualify as a historical resource for the purposes of the California Environmental Quality Act (CEQA).

Cumulative

A project may result in a significant adverse cumulative impact when its effects are cumulatively considerable. Cumulatively considerable means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects. The geographic scope of cumulative analysis is depicted in **Section 1 Executive Summary**, **Figure 1**. A master

list of cumulative projects within the study is provided in **Section 1 Executive Summary**, **Table 1-2**. These projects include:

- Wilkinson Solar Farm (Calipal Solar Farm I) – solar project
- Midway IV – solar project
- Wister Solar Energy Facility Project (Ormat Wister) – solar project
- Hell's Kitchen – geothermal project
- Energy Source Mineral ATLIS Project – commercial lithium hydroxide production plant
- VEGA SES 2, 3, and 5 Solar Energy Project – solar project
- Nider – solar project
- Elmore North Geothermal Project (ENGP) – geothermal project
- Black Rock Geothermal Project (BRGP) – geothermal project

5.4.2 Environmental Impacts

CULTURAL AND TRIBAL CULTURAL RESOURCES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to Public Resources Code, section 15064.5?	☐	☒	☐	☐
b. Would the project cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Public Resources Code, section 15064.5?	☐	☒	☐	☐
c. Would the project disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐
d. 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:				
i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code, section 5020.1(k), or	☐	☐	☐	☒

CULTURAL AND TRIBAL CULTURAL RESOURCES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code, section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code, section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☒	☐	☐	☐

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, cultural resources and tribal cultural resources.

5.3.2.1 Methodology and Thresholds of Significance

In addition to the above environmental checklist, staff used the following methodology and thresholds of significance to evaluate the project.

Various laws apply to the evaluation and treatment of cultural resources. CEQA requires the CEC to evaluate resources by determining whether they meet several sets of specified criteria. These evaluations then influence the analysis of potential impacts to the resources and the mitigation that may be required to reduce any such impacts.

Methodology

Direct impacts to cultural resources are those associated with project development, construction, and operation. Construction usually entails surface and subsurface disturbance of the ground, and direct impacts to archaeological resources can result from the immediate disturbance of the deposits, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation, or demolition of overlying structures. Construction can have direct impacts on historic standing structures when those structures must be demolished or removed to make way for new structures or when the vibrations of construction impair the stability of historic structures nearby. New structures can have direct impacts on historic structures when the new structures are stylistically incompatible with their neighbors and the setting, feeling and association. New structures might also produce something harmful to the materials or structural integrity of the historic structures, such as emissions or vibrations.

Indirect impacts to archaeological resources are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource components due to improved accessibility. Similarly, historic structures can suffer indirect impacts when project construction creates improved

accessibility to resources by non-project-affiliated personnel and the potential for vandalism or greater weather exposure becomes possible.

Thresholds of Significance

To determine whether a proposed project may have a significant effect on the environment, staff analyzes the project's potential to cause a substantial adverse change in the significance of historical or unique archaeological resources. The magnitude of an impact depends on:

- the historical resource(s) affected;
- the specific historic significance of any potentially impacted historical resource(s);
- how the historical resource(s) significance is manifested physically and perceptually;
- appraisals of those aspects of any historical resource's integrity that figure importantly in the manifestation of the resource's historical significance; and
- how much the impact will change historical resource integrity appraisals.

Title 14, California Code of Regulations, section 15064.5(b) defines a "substantial adverse change" as the "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 provides definitions for California Native American tribes, lead agency responsibilities to consult with California Native American tribes, and tribal cultural resources. A "California Native American tribe" is a "Native American tribe in California that is on the contact list maintained by the Native American Heritage Commission (NAHC) for the purposes of Chapter 905 of the Statutes of 2004" (Pub. Resources Code, § 21073). Lead agencies implementing CEQA are responsible to consult with California Native American tribes about tribal cultural resources within specific timeframes. If tribal cultural resources could be impacted by a CEQA project, lead agencies are to exhaust the consultation to points of agreement or termination.

CEQA also states that a project with an impact 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).

5.4.2.2 Direct and Indirect Impacts

a. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to California Code of Regulations, title 14, section 15064.5

Construction

Less Than Significant Impact with Mitigation Incorporated. No historical resources have been identified in the PAA. As noted in the discussion of "Interpretation of Results:

Archaeological Resources", the archaeological PAA has a moderate probability of containing buried archaeological resources, which could meet CEQA's criteria for historical archaeological resources. If such resources were damaged during construction (Impact Potential Damage to Buried Archaeological Resources), it would be considered significant because of the cultural loss to affiliated California Native American tribes or other local communities and the cultural and scientific data loss to all.

To reduce the significance of potential damage to buried archaeological resources, staff proposes conditions of certification (COCs) COC **CUL/TRI-1/ MM CUL/TRI-1** through COC **CUL/TRI-7 MM CUL/TRI-7** contained in this staff assessment. These COCs/MMs would put in place a rigorous construction monitoring program designed to reduce impacts to any discovered historical resources of an archaeological nature to a less-than-significant level.

Operation

No Impact. The CEC staff has not identified any historical resource impacts associated with operation of the proposed MBGP.

b. Would the project cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Public Resources Code, section 15064.5

Construction

Less Than Significant Impact with Mitigation Incorporated. No unique archaeological resources have been identified in the archaeological PAA. As noted in the discussion of CEQA Environmental Checklist criteria "a", the archaeological PAA has a moderate probability of containing buried archaeological resources, which could meet CEQA's criteria for unique archaeological resources. If such resources were damaged during construction (Potential Damage to a Unique Buried Archaeological Resource), it would be considered a significant impact because of the cultural loss to affiliated California Native American tribes or other local communities and the cultural and scientific data loss to all.

To reduce the significance of potential damage to a unique buried archaeological resource, staff proposes COCs COC **CUL/TRI-1/ MM CUL/TRI-1** through COC **CUL/TRI-7/ MM CUL/TRI-7** contained in this staff assessment. These COCs/MMs would reduce impacts to any discovered unique archaeological resources to a less-than-significant level.

Operation

No Impact. The CEC staff has not identified any unique archaeological resource impacts associated with operation of the proposed MBGP.

c. Would the project disturb any human remains, including those interred outside of dedicated cemeteries?

Construction

Less Than Significant Impact with Mitigation Incorporated. Ground disturbance associated with construction of the proposed MBGP could damage human remains, with or without associated resources that meet CEQA's criteria for historical, unique archaeological, or tribal cultural resources. Inadvertent damage of human remains is a significant impact under CEQA (Potential Inadvertent Damage of Human Remains). The CEC staff proposes COC **CUL/TRI-1/ MM CUL/TRI-1** through COC **CUL/TRI-6/ MM CUL/TRI-6** to reduce impacts to human remains to a less than significant level. COC **CUL/TRI-1/ MM CUL/TRI-1** requires that Native American Monitors are part of the construction monitoring team, COC **CUL/TRI-4/ MM/TRI-4** requires a workers environmental awareness program, and COCs **CUL/TRI-3/ MM CUL/TRI-3, CUL/TRI-5/ MM CUL/TRI-5,** and **CUL/TRI-6/ MM CUL/TRI-6** establish protocols to minimize or avoid impacts on inadvertently discovered human remains.

Operation

No Impact. The CEC staff has not identified any human remains impacts associated with operation of the proposed MBGP.

d. 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:

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

Construction

No Impact. The CEC staff has not identified tribal cultural resources that are already listed on the California Register of Historical Resources.

Operation

No Impact. The CEC staff has not identified tribal cultural resources that are already listed on the California Register of Historical Resources.

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

Construction

Significant and Unmitigable. The CEC staff concludes—based on consultation with California Native American tribes, information from the NAHC, independent research, and field visits to the proposed MBGP—that the Southeast Lake Cahuilla Active Volcanic Cultural District (SELCAVCD) is a significant tribal cultural resource for the purposes of CEQA. The proposed MBGP would result in several types of impacts on the SELCAVCD.

Impact: Visual Degradation of the SELCAVCD Viewshed. The proposed MBGP would result in dramatic changes to viewsheds to and from the SELCAVCD. The power plant or power block itself would be built within 1 mile of three contributing elements of the SELCAVCD (Old Mud Pots and Volcanoes, CA-IMP-003256H, and Red Island). The power block, measuring about 0.25 mile (north to south) and 0.36 mile (east to west), would consist of industrial buildings and structures at maximum heights between –183 and –133 feet relative to mean sea level. From Rock Hill and South Red Hill, the proposed MBGP would visually double the visible industrial development on the landscape surrounding the SELCAVCD (see Visual Resources, Figures 1–5). The CEC Cultural Resources Unit staff made similar observations from Obsidian Butte during the February 2024 field visits. In addition to the massing of the power plants themselves, plumes from the cooling towers would contribute to hazy visual conditions, further obscuring views toward the Chocolate Mountains (eastward) and Signal Mountain (southward). These viewsheds are critical elements in the Kamia, Cahuilla, and Quechan's teaching of traditional history, identity, and religion. Visual degradation of the SELCAVCD viewshed would be significant under CEQA. The CEC staff proposes COC **CUL/TRI-8** to reduce the severity of this impact. This COC calls for detailed documentation of the SELCAVCD and nominating it to the California Register of Historical Resources and National Register of Historic Places. Mere documentation cannot reduce **visual degradation of the SELCAVCD viewshed** to a less-than-significant level, but nomination to these registers would increase protection of the SELCAVCD from future impacts. The significance level of this impact remains significant even after implementation of COC **CUL/TRI-8**.

Impact: Intrusive Nighttime Visual Elements. Exterior nighttime lighting of MBGP facilities could diminish the historic integrity of the SELCAVCD. Exterior nighttime lighting would add unnatural illumination to the SELCAVCD and the surrounding landscape. Most critically, exterior lighting can create light pollution that renders the features of the night sky (namely celestial bodies like stars) dim or invisible. The Kamia pass on much traditional knowledge through nighttime storytelling at or near culturally significant places

like the Old Mud Pots and Volcanoes. Kamia cultural knowledge bearers use the nighttime sky to illustrate origin stories, provide moral instruction, and plan gatherings and use of natural resources. Without clear night skies, these cultural activities suffer. As a character-defining feature of the SELCAVCD, such nighttime visual intrusions would be a significant impact upon this tribal cultural resource.

The CEC staff's **Visual Resources** section of this staff assessment analyzes the effects of light pollution and grapples specifically with the issue of night-sky-friendly lighting. The CEC staff proposes COC **VIS-1/MM VIS-1** and COC **VIS-2/ MM VIS-2** to require installation of exterior lighting and building treatments that meet "DarkSky Approved" standards. The CEC staff concludes that implementing these two COCs would reduce intrusive nighttime visual elements to a less-than-significant level.

Operation

Significant and Unmitigable. The CEC staff has identified three operational impacts on cultural and tribal cultural resources (**Harm to Coyotes, Reptiles, and Burrowing Owls and Other Birds, Disruption of the Mud Volcanoes and Mud Pots,** and **Intrusive Noise**). COCs would reduce **Harm to Coyotes, Reptiles, and Burrowing Owls and Other Birds** to a less-than-significant level but **Disruption of the Mud Volcanoes and Mud Pots and Intrusive Noise** cannot be similarly reduced.

Impact: Harm to Coyotes, Reptiles, and Burrowing Owls and Other Birds. Project components like the open-air service water pond, retention basin, and brine pond could attract and entrap or otherwise harm animals that the Kamia consider integral to the SELCAVCD. Harm to Coyotes, Reptiles, and Burrowing Owls and Other Birds would be significant under CEQA for harming character-defining features of the SELCAVCD. The CEC staff proposes COC **BIO-19** to monitor the brine ponds for the presence of injured or dead birds. If biological monitors find injured or dead birds at the brine ponds, the Designated Biologist will institute measures to prevent further bird injury or mortality (see the **Biological Resources** section in this staff assessment). Implementation of COC **BIO-19** would reduce this impact to a less-than-significant level.

Impact: Disruption of the Mud Volcanoes and Mud Pots. As discussed earlier in this section of the staff assessment, the Mud Volcanoes and Mud Pots in the PAA are sites of healing, gathering pigment, and gathering. The mud pots and volcanoes also demonstrate that the Earth is a living entity, as reflected by the pulse of muds (heartbeat) and emitted steam (breath). Currently, only the Old Mud Pots and Volcanoes are easily accessible to Kamia, Cahuilla, and Quechan individuals. The operation of the MBGP would involve injecting water into the Salton Sea Known Geothermal Resource Area and extracting (production) brine from the same geothermal resource. Although geothermal developers and operators strive to maintain balance in the geothermal reservoir, injection and production could alter the way the mud pots and volcanoes exhibit their living qualities (heartbeat and breath). Such changes, in turn, could degrade the therapeutic qualities of the mud pots and volcanoes. Disruption of the Mud Volcanoes and Mud Pots would cause severe damage to the SELCAVCD and degrade a prominent contributor to

the district. This impact would be significant under CEQA. The CEC staff proposes COC **CUL/TRI-9/ MM CUL/TRI-9** to reduce the severity of impact, although it is unclear that the impact could be mitigated to a less-than-significant level.

Impact: Intrusive Noise. Noise produced by the MBGP's cooling towers would diminish the historic integrity of the SELCAVCD. Additional noise introduced, especially near the Old Mud Pots and Volcanoes, will make it increasingly difficult to hear the bubbling of the mud pots, the physical manifestation of the heartbeat of the spiritual entity identified by the Kamia as Mother Earth. Additionally, increased levels of noise at the Old Mud Pots could render the location inhospitable as a place of continued cultural transmission and education, making it too loud for culture bearers to be heard by students over the operational noise emanating from the MBGP facilities. As a place where the Kamia come to experience the presence of Mother Earth and provide culturally informed teachings, additional noise introduced to the area of the Old Mud Pots and Mud Volcanoes would be a significant impact upon the SELCAVCD.

5.4.2.3 Cumulative Impacts

This staff assessment identifies a tribal cultural resource, the SELCAVCD, in the MBGP PAA. The CEC staff concludes that the proposed MBGP would result in significant and unmitigable impacts on the SELCAVCD. The CEC staff identified five project-specific impacts on the SELCAVD (Impacts: Visual Degradation of the SELCAVCD Viewshed, Intrusive Nighttime Visual Elements, Harm to Coyotes, Reptiles, and Burrowing Owls and Other Birds, Disruption of the Mud Volcanoes and Mud Pots, and Intrusive Noise). The CEC staff concludes that Impacts of the Visual Degradation of the SELCAVCD Viewshed, Disruption of the Mud Volcanoes and Mud Pots, and Intrusive Noise are significant and unavoidable, whereas Impacts Intrusive Nighttime Visual Elements, and Harm to Coyotes, Reptiles, and Burrowing Owls and Other Birds will be less than significant after the implementation of COCs. This analysis addresses whether past, present, and probable future projects would produce related or cumulative impacts.

The geographic scope of cumulative analysis is depicted in **Section 1 Executive Summary**, **Figure 1**. A master list of cumulative projects within the study is provided in **Section 1 Executive Summary**, **Table 1-2**. These projects include:

- Wilkinson Solar Farm (Calipal Solar Farm I) – solar project
- Midway IV – solar project
- Wister Solar Energy Facility Project (Ormat Wister) – solar project
- Hell's Kitchen – geothermal project
- Energy Source Mineral ATLIS Project – commercial lithium hydroxide production plant
- VEGA SES 2, 3, and 5 Solar Energy Project – solar project
- Nider – solar project
- Elmore North Geothermal Project (ENGP) – geothermal project

- Black Rock Geothermal Project (BRGP) – geothermal project

Significant and Unmitigable. **The Visual Degradation of the SELCAVCD Viewshed.** Development between the shore of the Salton Sea and State Route 111 is conspicuous within the SELCAVCD viewshed. In addition to the proposed MBGP, six energy development projects are in this area: the ENGP, BRGP, Energy Source Mineral ATLIS Project, Hell's Kitchen Geothermal Project, Midway IV Solar Project, and the existing Hudson Ranch Geothermal I power plant. Construction and operation of these power plants and energy development projects would contribute to the significant and unavoidable **Visual Degradation of the SELCAVCD Viewshed** by placing additional intervening features, especially on the eastern-facing viewshed from the SELCAVCD.

Significant and Unmitigable. **Disruption of the Mud Volcanoes and Mud Pots,** and **Intrusive Noise** are the disruption of the mud pots and volcanoes' functioning and intrusive noise at the Old Mud Pots and Volcanoes, respectively. To the extent that the ENGP, BRGP, Energy Source Mineral ATLIS Project, Hudson Ranch Geothermal I power plant, and Hell's Kitchen Geothermal Project draw from the same geothermal resource associated with the mud pots and volcanoes, the projects contribute to a significant and unmitigable impact. The sound that the MBGP's cooling towers would emit, as discussed in **Intrusive Noise**, would compromise cultural practices and teaching at the Old Mud Pots and Volcanoes. Combined with the noise from the Hudson Ranch Geothermal I power plant, the volume of noise would be amplified, exacerbating the project-level impacts.

Less Than Significant with Mitigation Incorporated. **Intrusive Nighttime Visual Elements** and **Harm to Coyotes, Reptiles, and Burrowing Owls and Other Birds** concern intrusive nighttime visual elements and harm to coyotes, reptiles, and burrowing owls and other birds. The **Biological Resources** and **Visual Resources** sections of this staff assessment propose COCs/MMs to reduce these impacts to a less-than-significant level. Moreover, each concludes that the cumulative projects would not contribute significantly to these impacts. The CEC staff concludes, therefore, that these cumulative impacts are less-than-significant.

5.4.3 Applicable LORS and Project Conformance

Table 5.4-5 presents staff's determination of conformance with applicable local, state, and federal laws, ordinances, regulations, and standards (LORS), including any proposed Conditions of Certification, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific conditions of certification, the proposed project would be consistent with all applicable LORS. The subsection below, "Staff Proposed Conditions of Certification," contains the full text of the referenced conditions of certification.

TABLE 5.4-5 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
State	
Pub. Resources Code, § 5097.98, requires a landowner on whose property Native American human remains are found to limit further development activity in the vicinity until they confer with the NAHC-identified MLDs to consider treatment options. In the absence of MLDs or of a treatment acceptable to all parties, the landowner is required to reinter the remains elsewhere on the property in a location not subject to future disturbance.	**Yes.** See COCS **CUL/TRI-3–7 / MM CUL/TRI-3–7**
Pub. Resources Code, § 5097.99 prohibits the acquisition, possession, sale, or dissection with malice or wantonness of Native American remains or artifacts taken from a Native American grave or cairn.	
Health and Safety Code, § 7050.5, prohibits the disturbance or removal of human remains found outside a cemetery. It also requires a project owner to halt construction if human remains are discovered and to contact the county coroner.	
Local	
Imperial County General Plan: Conservation & Open Space Element (ICPDS 2016)	
Use the CEQA process to conserve cultural resources and conform to…Assembly Bill 52 "Consultation with Tribal Governments". Public awareness of cultural heritage will be stressed. All information and artifacts recovered in this process will be stored in an appropriate institution and made available for public exhibit and scientific review.	**Yes.** See COCS **CUL/TRI-3–7 / MM CUL/TRI-3–7**
Encourage the use of open space easements in the conservation of high value cultural resources.	
Discourage vandalism of cultural resources and excavation by persons other than qualified archaeologists.	
Maintain confidentiality of specific resource locations to prevent vandalism and desecration of sensitive cultural resources.	
County Municipal Ordinance, Title 9, Division 17, §§ 91702.00(A)(1), (B)(1)	
Renewable Energy Resources Ordinance: If any specimens of bone, stone, ceramic, or any other prehistoric or historic material are found during construction, all construction affecting the discovery site shall cease until a qualified archaeologist, retained by the applicant and approved by the Department of Planning and Development Services, reviews the specimens.	**Yes.** See COC **CUL/TRI-6 / MM CUL/TRI-6**
Renewable Energy Resources Ordinance: The recommendations of the archaeologist related to	

TABLE 5.4-5 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
the discovery shall be complied with prior to resuming construction.	
Renewable Energy Resources Ordinance: Project construction and operations shall be conducted so as to protect…cultural resources…	

Abbreviations: CEQA = California Environmental Quality Act; MLD = Most Likely Descendant; NAHC = California Native American Heritage Commission

5.4.4 Conclusions and Recommendations

As discussed above, the project would have significant and unmitigable impacts related to cultural and tribal cultural resources but would conform with applicable LORS. Nevertheless, the CEC is obligated to reduce significant impacts to the extent possible. Staff therefore recommends adopting the conditions of certification as detailed in subsection "5.4.5 Proposed Conditions of Certification" below.

5.4.5 Proposed Conditions of Certification

The following proposed COCs include measures to both mitigate environmental impacts and ensure conformance with applicable LORS. The COCs below are enforceable as part of the CEC's certificate for the portions of the project constituting the site and related facilities (power plant, gen-tie line to the first point of interconnect, water supply pipeline, and production and injection conveyance pipelines connecting directly to the power plant).

Additional impacts associated with project components outside of the CEC's jurisdiction, such as the well complex licensed by CalGEM and permitted by Imperial County, the temporary structures such as the construction camps, laydown/parking yards, and borrow pits to be permitted by Imperial County, and the switching station to be permitted by IID, require mitigation by other licensing jurisdictions to be less than significant. This CEQA analysis evaluates impacts resulting from all aspects of the project, and for the entire project to have less than significant impacts, the mitigation actions by other licensing jurisdictions described in these COCs would need to be implemented as mitigation measures (MMs). For this reason, some COCs are titled COC/MM.

For purposes of the facility certification issued by the CEC, the project owner must comply with the following COCs on the jurisdictional site and related facilities as delineated in **Section 3 Project Description**. Verifications set forth below only apply to the COCs, not the MMs.

COC CUL/TRI-1/ MM CUL/TRI-1 APPOINTMENT AND QUALIFICATIONS OF CULTURAL RESOURCES PERSONNEL

CULTURAL RESOURCE SPECIALIST The project owner shall assign a Cultural Resource Specialist (CRS) to the project. The project owner may elect to assign one or more alternate CRSs as well. The project owner shall submit the resumes

of the proposed CRS and Alternative CRS(s), with at least three references and contact information, to the CEC's Compliance Project Manager (CPM) for review and approval.

The CRS and Alternate CRS(s) shall have training and background that conform to the U.S. Secretary of the Interior's Professional Qualifications Standards, as published in Title 36, Code of Federal Regulations, part 61. In addition, the CRS and Alternate CRS(s) shall have the following qualifications:

A background in anthropology, archaeology, history, architectural history, or a related field, and

- At least 10 years of archaeological or historical experience (as appropriate for the project site), with resources mitigation and fieldwork;
- At least one year of field experience in California; and
- At least three years of experience in a decision-making capacity on cultural resources projects in California and the appropriate training and experience to knowledgably make recommendations regarding the significance of cultural resources.

The project owner may replace the CRS by submitting the required resume, references and contact information of the proposed replacement CRS to the CPM.

The CRS shall manage all cultural resource monitoring, mitigation, curation, and reporting activities, and any pre-construction cultural resource activities, unless management of these is otherwise provided for in accordance with the cultural resource and tribal cultural resource COCs. The CRS shall serve as the primary point of contact on all cultural resource matters for the CEC. The CRS shall retain Native American Monitors and may elect to obtain the services of Cultural Resource Monitors (CRMs) and other technical specialists, if needed, to assist in monitoring, mitigation, and curation activities. The project owner shall ensure that the CRS makes recommendations regarding the CEQA significance of any cultural or tribal cultural resources that are newly discovered or that may be affected in an unanticipated manner. After all ground disturbances are completed and the CRS has fulfilled all responsibilities specified in these cultural and tribal cultural resource COCs, the project owner may discharge the CRS, after receiving approval from the CPM.

CULTURAL RESOURCE MONITORS The CRS may assign Cultural Resources Monitors (CRMs). CRMs shall have the following qualifications:

- B.S. or B.A. degree in anthropology, archaeology, historical archaeology, or a related field; and one year of archaeological field experience in California; or
- A.S. or A.A. degree in anthropology, archaeology, historical archaeology, or a related field, and four years of archaeological field experience in California; or

- Enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historical archaeology, or a related field, and two years of archaeological field experience in California.

NATIVE AMERICAN MONITORS Preference in selecting Native American Monitors shall be given to California Native Americans with:

- Traditional ties to the area being monitored
- Knowledge of local Native American village sites and habitation patterns
- Knowledge and understanding of Health and Safety Code, section 7050.5 and Public Resources Code, section 5097.9 et seq.
- Ability to effectively communicate the requirements of Health and Safety Code, section 7050.5 and Public Resources Code, section 5097.9 et seq.
- Ability to work with law enforcement officials and the Native American Heritage Commission (NAHC) to ensure the return of all associated grave goods taken from a Native American grave during excavation
- Ability to travel to project sites within traditional tribal territory
- Knowledge and understanding of Title 14, California Code of Regulations, section 15064.5
- Ability to advocate for the preservation in place of Native American cultural features through knowledge and understanding California Environmental Quality Act (CEQA) mitigation provisions
- Ability to read a topographical map and be able to locate site and reburial locations for future inclusion in the NAHC's Sacred Lands Inventory
- Knowledge and understanding of archaeological practices, including the phases of archaeological investigation

CULTURAL RESOURCE TECHNICAL SPECIALISTS The resume(s) of any additional technical specialist(s) (e.g., geoarchaeologist, historical archaeologist, historian, architectural historian, or physical anthropologist), shall be submitted to the CPM for approval. The resume of each proposed specialist shall demonstrate that their training and background meet the U.S. Secretary of Interior's Professional Qualifications Standards for their specialty (if appropriate), as published in Title 36, Code of Federal Regulations, part 61. The resumes of specialists shall include the names and telephone numbers of contacts familiar with the work of these persons on projects referenced in the resumes and demonstrate to the satisfaction of the CPM that these persons have the appropriate training and experience to undertake the required research. All specialists are under the supervision of the CRS.

Verification: The project owner shall submit the prospective CRS's and any Alternate CRS's qualifications at least 75 days prior to the start of ground disturbance associated with site mobilization and construction.

The project owner may replace a CRS by submitting the required resume, references and contact information to the CPM at least 10 working days prior to the termination or release of the then-current CRS. In an emergency, the project owner shall immediately notify the CPM to discuss the qualifications and approval of a short-term replacement while a permanent CRS is proposed to the CPM for consideration.

At least 20 days prior to site mobilization, the CRS shall provide proof of qualifications for any anticipated CRMs and additional specialists for the project to the CPM.

Within 15 days of receiving from a California Native American tribe a request that Native American Monitors be employed, the project owner shall submit a copy of the request and a copy of a response letter to the group notifying them that Native American Monitors have been employed and identifying the Native American Monitors.

If efforts to obtain the services of qualified Native American Monitors are unsuccessful, the project owner shall inform the CPM of this situation in writing at least 30 days prior to the beginning of post-certification cultural resources field work or construction-related ground disturbance.

At least 5 days prior to additional CRMs or Native American Monitors beginning on-site duties during the project, the CRS shall review the qualifications of the proposed CRMs or Native American Monitors and send approval letters to the CPM, identifying the monitors and attesting to their qualifications. At least 10 days prior to any technical specialists beginning tasks, the resume(s) of the specialists shall be provided to the CPM for review and approval. At least 10 days prior to the start of construction-related ground disturbance, the project owner shall confirm in writing to the CPM that the approved CRS will be available for onsite work and is prepared to implement the cultural resources conditions.

No ground disturbances shall occur prior to CPM approval of the CRS and alternates unless such activities are specifically approved by the CPM.

COC CUL/TRI-2/ MM CUL/TRI-2 INFORMATION TO BE PROVIDED TO CRS Prior to the start of ground disturbance, the project owner shall provide the CRS with copies of the application for certification (AFC), data responses, confidential cultural resources reports, all supplements, the cultural and tribal cultural resources section from the CEC's Final Staff Assessment (FSA), and the cultural and tribal cultural resources COCs from the Final Decision for the project, if the CRS does not already possess copies of these materials. The project owner shall

also provide the CRS and the CPM with maps and drawings showing the footprints of the power plant, all linear facility routes, all access roads, and all laydown areas. Maps shall include the appropriate United States Geological Survey quadrangles and a map at an appropriate scale (e.g., 1:24,000 and 1 inch = 200 feet, respectively) for plotting cultural features or materials. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM. The CPM shall review map submittals and, in consultation with the CRS, approve those that are appropriate for use in cultural resources planning activities. No ground disturbance shall occur prior to CPM approval of maps and drawings unless such activities are specifically approved by the CPM. Maps shall include any cultural and tribal cultural resources, including any historic built environment resources, identified in the FSA's project area of analysis. If construction of the project would proceed in phases, maps and drawings not previously provided shall be provided to the CRS and CPM prior to the start of each phase. Written notice identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

Weekly, until ground disturbance is completed, the project construction manager shall provide to the CRS and CPM a schedule of project activities for the following week, including the identification of area(s) where ground disturbance will occur during that week.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.

The project owner shall provide the documents described in the first paragraph of this condition to new CRSs if the approved CRS is terminated or resigns.

Verification: At least 40 days prior to the start of ground disturbance, the project owner shall provide the CPM notice that the AFC, data responses, confidential cultural resources documents, all supplements, FSA, and Final Commission Decision have been provided to the CRS, if needed, and the subject maps and drawings to the CRS and CPM. The CPM will review submittals in consultation with the CRS and approve maps and drawings suitable for cultural resources planning activities.

At least 15 days prior to the start of ground disturbance, if there are changes to any project-related footprint, the project owner shall provide revised maps and drawings for the changes to the CRS and CPM.

At least 15 days prior to the start of each phase of a phased project, the project owner shall submit the appropriate maps and drawings, if not previously provided, to the CRS and CPM.

Weekly, during ground disturbance, a schedule of the next week's anticipated project activity shall be provided to the CRS and CPM by letter, e-mail, or fax.

Within 5 days of changing the scheduling of phases of a phased project, the project owner shall provide written notice of the changes to the CRS and CPM.

If a new CRS is approved by the CPM as provided for in **CUL/TRI-1**, the project owner shall provide the CPM notice that the AFC, data responses, confidential cultural resources documents, all supplements, FSA, Final Commission Decision, and maps and drawings have been provided to the new CRS within 10 days of such approval.

COC CUL/TRI-3/ MM CUL/TRI-3 CULTURAL AND TRIBAL RESOURCES MITIGATION AND MONITORING PLAN (CTRMMP) Prior to the start of ground disturbance, the project owner shall submit the CTRMMP, as prepared by or under the direction of the CRS, to the CPM for review and approval. The CTRMMP shall follow the content and organization of the draft model CTRMMP, provided by the CPM, and the authors' name(s) shall appear on the title page of the CTRMMP. The CTRMMP shall identify measures to minimize potential impacts to cultural and tribal cultural resources. Implementation of the CTRMMP shall be the responsibility of the CRS and the project owner. Copies of the CTRMMP shall reside with the CRS, alternate CRS, each CRM, and the project owner's on-site construction manager. No ground disturbance shall occur prior to CPM approval of the CTRMMP, unless such activities are specifically approved by the CPM. Portions of the CTRMMP that describe or map the location(s) of cultural and tribal cultural resources shall be designated as confidential.

The CTRMMP shall include the following elements and measures.

- The following statement included in the Introduction: "Any discussion, summary, or paraphrasing of the Conditions of Certification (COCs) in this CTRMMP is intended as general guidance and as an aid to the user in understanding the COCs and their implementation. The COCs, as written in the Commission Decision, shall supersede any summarization, description, or interpretation of the conditions in the CTRMMP. The Cultural and Tribal Cultural Resources COCs from the Commission Decision are contained in Appendix A."
- A proposed general research design that includes a discussion of cultural research questions and testable hypotheses specifically applicable to the project area, and a discussion of artifact collection, retention/disposal, and curation policies as related to the research questions formulated in the research design. The research design will specify that the preferred treatment strategy for any cultural or tribal cultural resource is avoidance. A specific mitigation plan shall be prepared for any unavoidable impacts to any historical resources, unique archaeological resources, or tribal cultural resources (as defined in the California Environmental Quality Act and determined by the CPM). A prescriptive treatment plan may be included in the CTRMMP for limited data types. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the ground-disturbance and post-ground–disturbance analysis phases of the project.

- Identification of the person(s) expected to perform each of the tasks, their responsibilities, and the reporting relationships between project construction management and the mitigation and monitoring team.
- A description of how Native American observers or monitors will be included, the procedures to be used to select them, and their role and responsibilities.
- A description of all impact-avoidance measures (such as flagging or fencing) to prohibit or otherwise restrict access to cultural or tribal cultural resources that are to be avoided during ground disturbance, construction, and/or operation, and identification of areas where these measures are to be implemented. The description shall address how these measures would be implemented prior to the start of ground disturbance and how long they would be needed to protect the resources from project-related effects. A statement that all encountered cultural and tribal cultural resources over 50 years old shall be recorded on Department of Parks and Recreation (DPR) 523 forms and mapped and photographed. In addition, all archaeological materials retained during archaeological investigations (survey, testing, data recovery) shall be curated in accordance with the California State Historical Resources Commission's (SHRC's) *Guidelines for the Curation of Archaeological Collections* (1993, or future updated guidelines from the SHRC), into a retrievable storage collection in a public repository or museum.
- A statement that the project owner will pay all curation fees for artifacts recovered and for related documentation produced during cultural and tribal cultural resource investigations conducted for the project. The project owner shall identify three possible curation facilities that could accept archaeological materials resulting from project activities.
- A statement demonstrating when and how the project owner will comply with Health and Human Safety Code, section 7050.5(b), and Public Resources Code, section 5097.98(b) and (e), including the statement that the project owner will notify the CPM and the NAHC of the discovery of human remains.
- A statement that the CRS has access to equipment and supplies necessary for site mapping, photography, and recovery of any archaeological materials that are encountered during ground disturbance and cannot be treated prescriptively.
- A description of the contents, format, and review and approval process of the final Cultural and Tribal Cultural Resources Report (CTRR), which shall be prepared according to *Archaeological Resource Management Report (ARMR)* guidelines.

Verification: Upon approval of the CRS proposed by the project owner, the CPM will provide to the project owner an electronic copy of the draft model CTRMMP for the CRS.

At least 30 days prior to the start of ground disturbance, the project owner shall submit the CTRMMP to the CPM for review and approval.

At least 30 days prior to the start of ground disturbance, in a letter to the CPM, the project owner shall agree to pay curation fees for any materials generated or collected during archaeological investigations (survey, testing, data recovery).

Within 90 days after completion of ground disturbance (including landscaping), if archaeological materials requiring curation were generated or collected, the project owner shall provide to the CPM a copy of an agreement with, or other written commitment from, a curation facility that meets the standards stated in the SHRC's *Guidelines for the Curation of Archaeological Collections* (1993, or future updated guidelines from SHRC), to accept the archaeological materials from this project. Any agreements concerning curation will be retained and available for audit for the life of the project.

COC CUL/TRI-4/ MM CUL/TRI-4 CULTURAL RESOURCES WORKER ENVIRONMENTAL AWARENESS PROGRAM (WEAP) Prior to and for the duration of ground disturbance, the project owner shall provide WEAP training to all new workers within their first week of employment at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas. The cultural and tribal cultural resources part of this training shall be prepared by the CRS, may be conducted by any member of the cultural and tribal cultural resources team, and may be presented in the form of a video. The CRS shall collaborate with one or more California Native American tribal members in preparing and presenting the training. During the training and during construction, the CRS shall be available (by telephone or in person) to answer questions posed by employees. The training may be discontinued when ground disturbance is completed or suspended, but must be resumed when ground disturbance, such as landscaping, resumes. The training shall include:

- A discussion of applicable laws and penalties under law;
- Samples or visuals of artifacts that might be found in the project vicinity;
- A discussion of what such artifacts may look like when partially buried, or wholly buried and then freshly exposed;
- A discussion of what prehistoric and historical archaeological deposits look like at the surface and when exposed during construction, and the range of variation in the appearance of such deposits;
- Instruction that the CRS, Alternate CRS, and CRMs have the authority to halt ground disturbance around a discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS;
- Instruction that employees, if the CRS, Alternate CRS, or CRMs are not present, are to halt work on their own in the vicinity of a potential cultural or tribal cultural resource discovery, and shall contact their supervisor and the CRS or

CRM, and that redirection of work would be determined by the construction supervisor and the CRS;

- An informational brochure that identifies reporting procedures in the event of a discovery;
- An acknowledgement form signed by each worker indicating that they have received the training; and
- A sticker that shall be placed on hard hats indicating that environmental training has been completed.

No ground disturbance shall occur prior to implementation of the WEAP program unless such activities are specifically approved by the CPM.

Verification: At least 30 days prior to the beginning of ground disturbance, the CRS shall provide the draft text and/or training video for the cultural and tribal cultural resources WEAP, including Native American participation, and graphics and the informational brochure to the CPM for review and approval.

At least 15 days prior to the beginning of ground disturbance, the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP-trained worker to sign.

Monthly, until ground disturbance is completed, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms of workers who have completed the training in the prior month and a running total of all persons who have completed training to date.

COC CUL/TRI-5/ MM CUL/TRI-5 UNDISCOVERED CULTURAL RESOURCES The project owner shall ensure that a CRS, alternate CRS, or CRM and Native American Monitor shall be on site for any ground disturbance associated with construction of the project.

Prior to the start of ground disturbance, the project owner shall notify the CPM and all interested California Native American tribes of the date on which ground disturbance will begin. Where excavation equipment is actively removing dirt and hauling the excavated material farther than 50 feet from the location of active excavation, full-time archaeological monitoring shall require at least two monitors per excavation area. In this circumstance, one monitor shall observe the location of active excavation and a second monitor shall inspect the dumped material. For excavation areas where the excavated material is dumped no farther than 50 feet from the location of active excavation, one monitor shall observe both the location of active excavation and inspect the dumped material.

If the CRS believes that the required number of monitors is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the

number of monitors shall be provided to the CPM for review and approval prior to any change in the number of monitors.

The research design in the CTRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered. On forms provided by the CPM, monitors shall keep a daily log of any monitoring and other cultural and tribal cultural resource activities and any instances of non-compliance with the COCs or applicable laws, ordinances, regulations, and standards (LORS). The daily monitoring logs shall at a minimum include the following information.

- First and last name of the monitors
- Time in and out
- Weather. Specify if weather conditions led to work stoppages.
- Work location (project component). Provide specifics—.e.g., power block, landscaping.
- Proximity to cultural or tribal cultural resource(s). Specify if work conducted within 1,000 feet of a known cultural resource.
- Work type (machine)
- Work crew (company, operator, and foreman)
- Depth of excavation
- Description of work
- Stratigraphy
- Artifacts, listed with the following identifying features
    - Field artifact #: When recording artifacts in the daily monitoring logs, the CRS shall institute a field numbering system to reduce the likelihood of repeat artifact numbers. A typical numbering system could include a project abbreviation, monitor's initials, and a set of numbers given to that monitor: e.g., MBGP-MB-123.
    - Description
    - Measurements
    - Universal Transverse Mercator (UTM) coordinates
    - Whether artifacts are likely to be isolates or components of larger resources
    - Assessment of significance of any finds
- Actions taken
- Plan for the next work day

A cover sheet shall be submitted with each day's monitoring logs, and shall at a minimum include the following.

- Count and list of first and last names of all monitors for that day
- General description (in paragraph form) of that day's overall monitoring efforts, including monitor names and locations
- Any reasons for halting work that day
- Count and list of all artifacts found that day: include artifact #, location (i.e., grading in Unit X), measurements, UTMs, and very brief description (i.e., historic can, granitic biface, quartzite flake)
- Whether any artifacts were found out of context (i.e., in fill, caisson drilling, flood debris, spoils pile)

Copies of the daily monitoring logs and cover sheets shall be provided by email from the CRS to the CPM, as follows.

- Each day's monitoring logs and cover sheet shall be merged into one PDF document
- The PDF title and headings, and emails shall clearly indicate the date of the applicable monitoring logs
- PDFs for any revised or resubmitted versions shall use the word "revised" in the title

Daily and/or weekly maps shall be submitted along with the monitoring logs as follows.

- The CRS shall provide daily and/or weekly maps of artifacts at the request of the CPM. A map shall also be provided if artifact locations show complexity, high density, or other unique considerations.
- Maps shall include labeled artifacts, project boundaries, previously recorded sites and isolates, aerial imagery background, and appropriate scales

From the daily monitoring logs, the CRS shall compile a monthly monitoring summary report to be included in the MCR. If there are no monitoring activities, the summary report shall specify why monitoring did not occur.

The Cultural and Tribal Cultural Resources section of the MCR shall be prepared in coordination with the CRS and shall include a monthly summary report of cultural and tribal cultural resources-related monitoring. The summary shall:

- List the number of monitors on a daily basis, as well as provide monthly monitoring-day totals
- Give an overview of cultural and tribal cultural resource monitoring work for that month and discuss any issues that arose

- Describe fulfillment of requirements of each cultural and tribal cultural resource mitigation measure
- Summarize the confidential appendix to the MCR, without disclosing any specific confidential details
- Include the artifact concordance table (as discussed below), but with removal of UTMs

Each MCR, prepared under supervision of the CRS, shall be accompanied by a confidential appendix that contains:

- Completed DPR 523A forms for all artifacts recorded or collected in that month. For any artifact without a corresponding DPR form, the CRS shall specify why the DPR form is not applicable or pending (i.e. as part of a larger site update).
- A concordance table that matches field artifact numbers with the artifact numbers used in the DPR 523 forms shall be included. The sortable table shall contain each artifact's date of collection and UTM coordinates and note if an artifact has been deaccessioned or otherwise does not have a corresponding DPR 523 form. Any post-field log recordation changes to artifact numbers shall also be noted. DPR forms shall be submitted as one combined PDF. The PDF shall organize DPR forms by site and/or artifact number
- The PDF shall include an index and bookmarks

If artifacts from a given location (near each other or an existing resource) are collected month after month, and if agreed upon with the CPM, a final updated DPR 523 form for the resource may be submitted at the completion of monitoring. The monthly concordance table shall note that the DPR 523 form for the included artifacts is pending.

The CRS or alternate CRS shall report daily to the CPM on the status of the project's cultural and tribal cultural resource-related activities, unless reducing or ending daily reporting is requested by the CRS and approved by the CPM. If the CRS believes that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring. The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural and tribal cultural resource monitoring and mitigation activities with CEC technical staff.

Cultural and tribal cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS, or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these COCs.

Upon becoming aware of any incidents of non-compliance with the Conditions and/or applicable LORS, the CRS and/or the project owner shall notify the CPM.

The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the COCs. When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the CPM.

Verification: At least 30 days prior to the start of ground disturbance, the CPM will notify all Native Americans with whom the CEC communicated during the project review of the date on which the project's ground disturbance will begin.

At least 30 days prior to the start of ground disturbance, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log and information to be included in the cover sheet for the daily monitoring logs.

While monitoring is on-going, the project owner shall submit each day's monitoring logs and cover sheet merged into one PDF document by email within 24 hours.

The CRS and/or project owner shall notify the CPM of any incidents of non-compliance with the conditions and/or applicable LORS by telephone or email within 24 hours.

The CRS shall provide daily maps of artifacts along with the daily monitoring logs if more than 10 artifacts are found per day, or as requested by the CPM.

The CRS shall provide weekly maps of artifacts if there more than 50 artifacts are found per week, or as requested by the CPM. The map shall be submitted within two business days after the end of each week.

While monitoring is on-going, the project owner shall submit monthly MCRs and accompanying weekly summary reports. The project owner shall attach any new DPR 523A forms, under confidential cover, completed for finds treated prescriptively, as specified in the CTRMMP.

Final updated DPR 523 forms with sites (where artifacts are collected month after month) can be submitted at the completion of monitoring, as agreed upon with the CPM.

At least 24 hours prior to implementing a proposed change in monitoring level, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for changing the monitoring level.

Within 15 days of receiving them, the project owner shall submit to the CPM copies of any comments or information provided by California Native American tribes in response to the project owner's transmittals of information.

COC CUL/TRI-6/ MM CUL/TRI-6 POWERS OF CRS The CRS shall have the authority to halt ground disturbance in the event of a discovery. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

If a cultural or tribal cultural resource over 50 years of age is found (or if younger, determined exceptionally significant by the CRS), or impacts to such a resource can be anticipated, ground disturbance shall be halted or redirected in the immediate vicinity of the discovery sufficient to ensure that the resource is protected from further impacts. If the discovery includes human remains, the project owner shall comply with the requirements of Health and Human Safety Code § 7050.5(b) and shall additionally notify the CPM and the NAHC of the discovery of human remains. No action with respect to the disposition of human remains of Native American origin shall be initiated without direction from the CPM. Monitoring, including Native American monitoring, and daily reporting, as provided in other conditions, shall continue during the project's ground-disturbing activities elsewhere, while the halting or redirection of ground disturbance in the vicinity of the discovery shall remain in effect until the CRS has visited the discovery, and all the following has occurred:

- The CRS has notified the project owner, and the CPM has been notified within 24 hours of the discovery, or by Monday morning if the cultural or tribal cultural resource discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning, including a description of the discovery (or changes in character or attributes), the action taken (i.e., work stoppage or redirection), a recommendation of California Environmental Quality Act (CEQA) significance, and recommendations for data recovery from any cultural or tribal cultural resource discoveries, whether or not a determination of CEQA significance has been made.
- If the discovery would be of interest to California Native American tribes, the CRS has notified all California Native American tribes that expressed a desire to be notified in the event of such a discovery
- The CRS has completed field notes, measurements, and photography for a DPR 523 Primary Record form. Unless the find can be treated prescriptively, as specified in the CTRMMP, the "Description" entry of the DPR 523 Primary Record form shall include a recommendation on the CEQA significance of the discovery. The project owner shall submit completed forms to the CPM.
- The CRS, the project owner, and the CPM have conferred, and the CPM has concurred with the significance finding concerning the discovery and approved the CRS's proposed data recovery, if any, including the curation of the artifacts,

or other appropriate mitigation; and any necessary data recovery and mitigation have been completed

Ground disturbance may resume only with the approval of the CPM.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall provide the CPM and CRS with a letter confirming that the CRS, Alternate CRS, CRMs, and Native American Monitors have the authority to halt ground disturbance in the vicinity of a cultural or tribal cultural resource discovery, and that the project owner shall ensure that the CRS notifies the CPM within 24 hours of a discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning.

Unless the discovery can be treated prescriptively, as specified in the CTRMMP, completed DPR 523 forms for resources newly discovered during ground disturbance shall be submitted to the CPM for review and approval no later than 24 hours following the notification of the CPM, or 48 hours following the completion of data recordation/recovery, whichever the CRS decides is more appropriate for the subject cultural or tribal cultural resource.

Within 48 hours of the discovery of a resource of interest to Native Americans, the project owner shall ensure that the CRS notifies all California Native American tribes that expressed a desire to be notified in the event of such a discovery, and the CRS must inform the CPM when the notifications are complete.

No later than 30 days following the discovery of any Native American cultural materials, the project owner shall submit to the CPM copies of the information transmittal letters sent to the chairpersons of the California Native American tribes or groups who requested the information. Additionally, the project owner shall submit to the CPM copies of letters of transmittal for all subsequent responses to Native American requests for notification, consultation, and reports and records.

Within 15 days of receiving them, the project owner shall submit to the CPM copies of any comments or information provided by California Native American tribes in response to the project owner's transmittals of information.

COC CUL/TRI-7/ MM CUL/TRI-7 FINAL CULTURAL AND TRIBAL CULTURAL RESOURCES REPORT (CTRR) The project owner shall submit the final CTRR to the CPM for approval. The final CTRR shall be written by or under the direction of the CRS and shall be provided in the ARMR format. The final CTRR shall report on all field activities including dates, times and locations, results, samplings, and analyses. All survey reports, DPR 523 forms, data recovery reports, and any additional research reports not previously submitted to the California Historical Resources Information System (CHRIS) shall be included as appendices to the final CTRR.

If the project owner requests a suspension of all construction activities for more than 30 days, then a draft CTRR that covers all cultural and tribal cultural resources activities associated with the project shall be prepared by the CRS and submitted to the CPM for review and approval on the same day as the suspension/extension request. The draft CTRR shall be retained at the project site in a secure facility until construction resumes or the project is withdrawn. If the project is withdrawn, then a final CTRR shall be submitted to the CPM for review and approval at the same time as the withdrawal request.

Verification: Within 30 days after requesting a suspension of construction activities, the project owner shall submit a draft CTRR to the CPM for review and approval.

Within 90 days after completion of ground disturbance (including landscaping), the project owner shall submit the final CTRR to the CPM for review and approval. If any reports have previously been sent to the CHRIS, then receipt letters from the CHRIS or other verification of receipt shall be included in an appendix.

Within 10 days after CPM approval of the CTRR, the project owner shall provide documentation to the CPM confirming that copies of the final CTRR have been provided to the CHRIS, the curating institution, if archaeological materials were collected, and to the tribal chairpersons of any California Native American tribes that request copies of project-related reports.

COC CUL/TRI-8 DOCUMENT AND NOMINATE THE SELCAVCD TO THE CALIFORNIA AND NATIONAL REGISTERS The project owner shall retain a professional cultural anthropologist to document the SELCAVCD on a National Register of Historic Places (NRHP) Nomination Form and submit the form to nominate the cultural district to the NRHP (successful nomination to the NRHP will automatically list the SELCAVCD on the California Register of Historical Resources as well). In the event that NRHP nomination is not attainable, the professional cultural anthropologist shall nominate the SELCAVCD to the California Register of Historical Resources.

The selected cultural anthropologist shall work with members of the Kwaaymii Laguna Band of Mission Indians (care of Courtney Coyle), Agua Caliente Band of Cahuilla Indians, and Fort Yuma Quechan Tribe during documentation of the SELCAVCD.

Verification: Within 90 days of certification, the project owner shall submit the qualifications of at least three professional cultural anthropologists to the CPM and the designees of the Kwaaymii Laguna Band of Mission Indians (care of Courtney Coyle), the Agua Caliente Band of Cahuilla Indians, and the Fort Yuma Quechan Tribe for review and approval.

The CPM and the designees of the Kwaaymii Laguna Band of Mission Indians, Agua Caliente Band of Cahuilla Indians, and Fort Yuma Quechan Tribe shall inform the

project owner within 60 days whether any of the candidate cultural anthropologists appear suited to implementation of this COC.

The cultural anthropologist shall submit a draft NRHP nomination form to the CPM and aforementioned tribes prior to submittal to federal agencies or the California State Historic Preservation Officer.

COC CUL/TRI-9/ MM CUL/TRI-9 MONITOR THE FUNCTIONING OF MUD POTS AND VOLCANOES The project owner shall work with the CPM, CRS, and the Kwaaymii Laguna Band of Mission Indians, Agua Caliente Band of Cahuilla Indians, and Fort Yuma Quechan Tribe to devise a monitoring plan for the three sets of mud pots and volcanoes documented in this staff assessment. The monitoring plan will establish standards for measuring both the pre-project and post-construction behavior of the mud pots and volcanoes. Minimally, these standards must consist of the mud volcanoes' pulse, steam emissions, and audibility of these characteristics. The monitoring plan must also identify responsible personnel, a monitoring schedule, and standards for reporting. Finally, if the monitoring plan identifies negative changes to the functioning of the mud pots and volcanoes, it will recommend ways that the operation of the geothermal wells could be altered to benefit the functioning of the mud pots and volcanoes, if feasible.

Verification: At least 60 days prior to the start of ground disturbance, the project owner shall submit the monitoring plan to the CPM for review and approval. The plan must include input from the Kwaaymii Laguna Band of Mission Indians, Agua Caliente Band of Cahuilla Indians, and Fort Yuma Quechan Tribe.

Implementation of the monitoring plan shall commence no later than 30 days prior to the start of construction activities.

The frequency of progress reports shall be determined in the monitoring plan and shall include the CPM and tribes in the reporting distribution.

5.4.6 References

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5.5 Efficiency and Energy Resources

Ardalan R. Sofi

5.5.1 Environmental Setting

The proposed Morton Bay Geothermal Project (MBGP or project) would generate electricity through the utilization of geothermal resources. The project would consist of two main elements: the geothermal Resource Production Facility (RPF) and the geothermal Power Generation Facility (PGF). The PGF would consist of one geothermal power block, including a condensing steam turbine generator (STG) set, the gas removal and abatement systems, and the heat rejection systems (Jacobs 2023a, Section 5.1.1). The STG would be a triple-pressure condensing turbine capable of providing a baseload supply of electricity of up to 140 megawatts (MW) (Jacobs 2023a, Section 2.3.3.5). The RPF would provide geothermal fluid from production wells through above ground pipelines to the steam handling system, where the steam would be separated from the liquid phase. MBGP would contribute baseload power to local and regional renewable energy supplies and enhance the stability of the electrical grid.

During the operation of MBGP, three emergency standby diesel-fueled generators (gensets) would support the critical facility load in case of a power interruption. Each of these gensets would have a maximum capacity of 3.49 MW. There would also be a fire pump genset with a maximum capacity of 236 kilowatts (kW) (Jacobs 2023a, Section 2.3.3.6.8, and Section 5.1.7.1.1, and Jacobs 2023kk). These gensets would be the only source of electricity production (on an emergency and testing basis only) using fossil fuel during operations.

Regulatory

Federal

There are no applicable federal laws, ordinances, regulations, and standards (LORS) that govern the efficiency of the utilization of geothermal resources.

State

California 2022 Energy Efficiency Standards for Residential and Nonresidential Buildings—Green Building Standards Code, California Code of Regulations, Title 24. The California Green Building Standards Code (Cal. Code of Regs., tit. 24, pt. 11) applies to the planning, design, operation, construction, use, and occupancy of newly constructed power plants and their ancillary facilities and requires the installation of energy efficient indoor infrastructure.

Senate Bill 100—The 100 Percent Clean Energy Act of 2018. Senate Bill (SB) 100 (Chapter 312, Statutes of 2018) requires that retail sellers and local publicly owned electric utilities procure a minimum quantity of electricity products from eligible renewable energy resources so that the total kilowatt-hours of those products sold to their retail

end-use customers achieve 44 percent of retail sales by December 31, 2024, 52 percent by December 31, 2027, and 60 percent by December 31, 2030. The bill also requires the Public Utilities Commission, California Energy Commission, and State Air Resources Board to utilize programs authorized under existing statutes to meet the state policy goal of 100 percent of total retail sales of electricity in California provided by eligible renewable energy resources and zero-carbon resources by December 31, 2045.

Local

Imperial County General Plan. The effort to prepare the Imperial County General Plan began in 1987 and was completed in 1993. The General Plan includes the development of renewable energy (Imperial 2015).

Cumulative

Section 15130 of the California Environmental Quality Act (CEQA) Guidelines (Cal. Code Regs., tit. 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The CEQA Guidelines require that the discussion reflect the severity of the impacts and the likelihood of their occurrence but need not provide as much detail as the discussion of the impacts attributable to the project alone.

Pursuant to CEQA, a cumulative impacts analysis can be performed by either 1) summarizing growth projections in an adopted general plan or in a prior certified environmental document, or 2) compiling a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this Staff Assessment. Section 1 Executive Summary, Table 1-2. These projects include:

- Black Rock Geothermal Project
- Cal Energy Generation
- Elmore Geothermal Project
- Elmore North Geothermal Project
- Hudson Ranch Power Plant
- Leathers Geothermal Facility
- Vulcan Power Plant

The cumulative impact on energy resources is determined by analyzing long-term trends in resource parameters such as pressure, temperature, and production rate using predictive models. These parameters would be compared to historical data to evaluate the long-term sustainability and resource adequacy under the combined load of existing and planned projects.

5.5.2 Environmental Impacts

EFFICIENCY AND ENERGY RESOURCES Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☒	☐

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix F and Appendix G, energy

5.5.2.1 Methodology and Thresholds of Significance

Methodology

In addition to the above environmental checklist, staff used the following methodology and thresholds of significance to evaluate the project.

The methodology consists of comparing the energy that would be consumed by the proposed project with the available energy resources (geothermal resources).

Thresholds of Significance

There is no specific threshold of significance. However, the project would have a significant impact if its construction and operation significantly impact the available energy resources.

5.5.2.2 Direct and Indirect Impacts

a. Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Construction

Less Than Significant Impact. The expected duration for the construction of the project is approximately 29 months, including additional time for equipment delivery and demobilization. Construction activities would be divided into five phases: site preparation and excavation; concrete pouring; steel erection; mechanical; and cleanup (Jacobs 2023a, Section 5.7). Throughout these construction phases, various equipment, such as bulldozers, excavators, cranes, and trucks would consume nonrenewable energy resources, primarily fossil fuels such as gasoline and diesel. It is anticipated that fossil fuels used by the equipment during construction would be used efficiently and would not

result in significant long-term depletion of these energy resources or permanently increase the project's reliance on them.

The idling time of construction equipment during the construction phase would be minimized by either shutting off equipment when not in use or reducing the idling time to a maximum of 5 minutes (Jacobs 2023a, Section 5.1.7.2.2). The project would also implement construction waste management methods, such as recycling and waste characterization, to reduce the amount of construction waste going to the landfill and consequently reduce the energy consumption during construction (Jacobs 2023a, Section 5.14.1.2.1 and Section 5.14.4).

Therefore, construction would create a less than significant impact on local and regional energy supplies and a less than significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources.

Operation

Less Than Significant Impact. The project would use geothermal resources in the form of steam, consuming geothermal energy. According to the project resource adequacy report provided by the applicant, sufficient resources exist to supply the project for its designed life cycle (Jacobs 2023r).

Geothermal power plants produce electric power by expanding steam in the STG. This steam comes from heated, pressurized brine in the ground. Geothermal resources are considered renewable if the quantities of water and heat used are being replaced continuously. Water recharge can occur from rainfall, subterranean drainage, or human efforts. Heat recharge occurs when there is sufficient heat, near enough to the surface, to replace that used in power generation. The geothermal resource available at the Salton Sea Known Geothermal Resource Area (the Salton Sea KGRA) can be considered renewable because a magma intrusion near the surface provides heat recharge, and subterranean and surface drainage from an area of 8,360 square miles provides water recharge.

The applicant proposes to use a high efficiency, triple-pressure STG. The geothermal fluid would be conveyed to the steam handling system, where steam would be separated from the brine in three flashes, producing high-pressure, standard-pressure, and low-pressure steam for use in the turbine. Chemically stabilized brine would flow from the steam handling system to the solids handling system where solids would be removed, after which the brine would be injected back into the ground (Jacobs 2023a, Section 5.15.2.3.2). The turbine would use the steam produced at all three pressures to generate power—the most efficient STG configuration available.

In the older, less efficient geothermal plants operating in the KGRA, steam is produced at two pressures, high and low. Before entering the steam turbine, the high-pressure steam is throttled down to the pressure of the low-pressure steam, where it is mixed with the rest of the low-pressure steam. Only this low-pressure (low energy content) steam is

expanded in the turbine to generate power, and much of the energy in the higher pressure (higher energy content) steam is wasted. In modern geothermal power plants such as the proposed project, the triple-pressure STG harnesses much of the stored energy in the steam, resulting in higher thermal efficiency.

The project is designed with a capacity of 140 MW (net) and would have a maximum annual electrical production of 1,226,400 megawatt-hours (MWh) (Jacobs 2023a, Section 2.1). MBGP has the capability to operate continuously for 24 hours a day, 7 days a week (Jacobs 2023a, Section 2.3.5.1).

The project's thermal efficiency would be approximately 11.5 percent. This percentage indicates that during operation, the facility generates electrical power equivalent to 11.5 percent of the total geothermal heat extracted from the reservoir. The project's efficiency would be comparable to that of similar triple-pressure STG geothermal projects existing in the KGRA, or higher due to the possible deterioration of the existing units over the years.

The project would employ one set of interconnected, fourteen-cell units, evaporative cooling towers (Jacobs 2023kk). The local climate in the Salton Sea area is characterized by high temperatures and low relative humidity (low wet-bulb temperature). In low temperatures and high relative humidity (low dry-bulb temperature), the air-cooled condenser performs relatively efficiently compared to the evaporative tower. However, at the project area (low wet-bulb temperature and high dry-bulb temperature) the air-cooled condenser performance is relatively poor compared to that of an evaporative cooling tower. Furthermore, the performance of the heat rejection system affects the performance of the STG, impacting turbine efficiency. At the project site, evaporative cooling would be considerably more effective than the air-cooled condenser, resulting in higher STG efficiency.

For reliability purposes (i.e., readiness testing and maintenance) the gensets would be expected to operate for no more than 50 hours (each) per year (Jacobs 2023a, Section 6.5.1.1). At this rate, the total quantities of diesel fuel used for the four gensets operating at full load would be approximately 790 barrels per year (bbl/yr)[1]. California has a diesel fuel supply of approximately 298,771,000 bbl/yr[2]. The project's use of fuel would constitute a small fraction (less than 0.00026 percent) of available resources, and the state's supply is more than sufficient to meet necessary demand. For these reasons, the project's use of fuel would be less than significant.

Furthermore, MBGP would incorporate various energy conservation design features to enhance energy efficiency, including implementing advanced lighting controls and

1 Calculated as: [(219 gal/hr x 3 generators)+(6 gal/hr x 1 fire pump)] x 50 hours per year = 33,150 gallons per year = 790 bbl/yr.

2 This is the sum of the annual production of 102,480,000 bbl and available stocks of 196,291,000 bbl obtained from the Energy Commission's Weekly Fuels Watch Report for 2022 (latest annual report available).

utilizing highly reliable pumps and motors. These measures are specifically designed to minimize energy consumption and optimize the overall performance of the project.

Staff concludes that the geothermal energy source for the project is plentiful, project's thermal efficiency is comparable to other efficient geothermal power plants in the Salton Sea KGRA, and consumption of nonrenewable energy resources would be limited. Therefore, energy consumed by MBGP would not create significant adverse effects on energy supplies or resources, nor would it consume energy in a wasteful or inefficient manner.

b. Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Construction

Less Than Significant Impact. The project is committed to energy-efficient construction and would implement measures to reduce energy consumption during construction process. The project would recycle construction and demolition debris in compliance with Assembly Bill 341 and State Bill 1018, which mandate commercial recycling (Jacobs 2023a, Section 5.14.5.2). The project would also implement measures to promote walking, bicycling and transit use, thereby reducing motor vehicle use Jacobs (2023a, Section 5.12.1.5). Moreover, MBGP would be required to comply with the California Green Building Code.

Operation

Less Than Significant Impact. During operation, MBGP would utilize geothermal energy from Salton Sea KGRA to provide 140 MW (net) baseload renewable electricity to the Imperial Irrigation District (IID) transmission system. IID has committed to meeting California's Renewable Portfolio Standard through its Integrated Resource Plan (IID 2018). In 2022, 37.7 percent of IID's power supply was sourced from renewable energy, with 7.8 percent coming from biomass and biowaste, 11.3 percent from geothermal, 6.6 percent from hydroelectric, and 12 percent from solar sources (IID 2022). MBGP would contribute to advancing renewable energy production in Imperial County by providing IID with electricity from a renewable resource. Furthermore, the project would be consistent with the General Plan and SB 100 because it would utilize renewable energy resources.

The project would comply with California Green Building Code through conformance with the California Building Standard Codes.

The project would primarily use renewable energy resources; however, ultra-low sulfur diesel would be used for the gensets (Jacobs 2023a, Section 5.1.7.1.2). Since the gensets would operate only during routine testing and maintenance, which is limited to 50 hours per genset annually, and in the case of emergencies, and that the generated electricity would only serve the project and not the electric grid, the project's use of diesel fuel would not obstruct or inhibit the state from achieving its energy-related goals. Furthermore, the project's primary goal is to provide capacity and energy to California's

electric markets and subsequently contribute to the state's commitment to establishing an environmentally clean and reliable electrical system.

Through energy-efficient design and increased renewable electricity generation, the project would neither conflict with nor obstruct state or local plans for renewable energy or energy efficiency and, therefore, would have no impact on those plans.

5.5.2.3 Cumulative Impacts

Staff consulted with the California Department of Conservation, Geologic Energy Management Division (CalGEM), which has expertise in geothermal fields. Based on this consultation, it is evident that historically, the geothermal production wells have maintained pressure for decades with minimal loss. The geothermal resource evaluation prepared by the CalGEM concluded that there is adequate geothermal resource in the region to support the proposed BHE Renewables, LLC projects (Black Rock, Elmore North, Morton Bay) with a cumulative capacity of 357 net MW for 30 years (CDOC 2023a). Therefore, staff expects MBGP to maintain adequate geothermal resources for the project's life. Furthermore, the overall thermal efficiency of MBGP would be independent of other projects. On May 31, 2023, the CEC confirmed these findings by determining the project met the requirements of Public Resources Code section 25540.2(a) and that filing of a Notice of Intent was not required because the applicant demonstrated, based on evidence in the record (See TN 249913, TN 250042, TN 250207, TN 250216, TN 250362, TN 250366, and TN 250451 filed in the proceeding's docket), the project's capability to provide geothermal resources in commercial quantities and for the regional resource to support current and future planed geothermal projects.

On February 26, 2024, April 15, 2024 (TN 255704), and June 12, 2024 (TN 256821), Cyrq Energy, the owner of Hudson Ranch Power I (HR1) geothermal facility located next to the proposed MBGP site, filed information into the docket, raising concerns that MBGP's operations would reduce HR1's energy output though competing use of nearby geothermal resources. Cyrq submitted an analysis by Geothermal Resources Group alleging, among other things, that the MBGP's power density exceeds sustainable resource levels and the proximity of MBGP's proposed wells to HR1 would reduce output for both facilities (HRP1 2024i and HRP1 2024j).

CEC staff researched the concerns by meeting with Cyrq, reviewing the filed materials, consulting with CalGEM, and requesting the applicant file an in-depth response to Cyrq's technical analysis, which was done on April 30, 2024 (Jacobs 2024s). Based on staff's research and after consulting with CalGEM, staff concurs with the analysis and conclusions set forth in the applicant's April 30, 2024 (TN 256064), technical response that the operation of MBGP will not result in a reduction of output at HR1.

The applicant articulated several reasons, with supporting data and analysis, for this conclusion in their April 30, 2024, filing. First, the applicant noted that some of the conclusions in the Geothermal Resources Group report are based on outdated and limited information from 2010 or reliance on modeling that is of a lower level of precision than

the modeling data used by the applicant. For example, using a 3D numerical model of the reservoir coupled to well bore models of the production and injection wells compared with using less precise power density modeling relied on by Cyrq (Jacobs 2024s).

The applicant's April 30, 2024 filing also stated that the MBGP's well locations, resource area, power plant site, production supply, and injection capacity are all located to maintain sufficient spacing between wells to minimize and avoid possible thermal and pressure impacts. The selected spacing between the proposed wells is consistent with historical spacing in the region, which has proven to be sustainable. Sufficient distance between production and injection areas ensures that production fluid is not quenched by injection fluid and the reservoir receives adequate pressure support from the returned injection fluid. Additionally, injection and production are placed at different levels to allow gravity to support the migration of denser injection fluid toward the heat source for reheating, while hotter, less dense fluid upwell towards the production area (Jacobs 2024s).

The applicant also noted that Cyrq used assumptions that were not factually accurate. For example, Cyrq did not consider the reinjection of production fluid and the known beneficial effects on resource pressure. MBGP is estimated to inject more than 85 percent of the produced fluid annually, which helps with pressure support. Not including injection in the simplified model grossly overestimates the potential for pressure effects (Jacobs 2024s).

Based on substantial evidence in the record, the utilization of geothermal energy by the project would not result in a significant cumulative impact when considered with other projects identified under the cumulative setting, above. In addition, the operations of the MBGP will not result in a reduction of output at HR1. To the extent Cyrq continues to conclude the MBGP may impact its operational economics, staff encourages Cyrq and BHER to reach mutual resolution of this matter.

5.5.3 Project Conformance with Applicable LORS

Table 5.5-1 staff's determination of conformance with applicable state LORS to ensure the project would comply with LORS. As shown in this table, staff concludes that the proposed project would be consistent with all applicable LORS.

TABLE 5.5-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
State	
Senate Bill 100—The 100 Percent Clean Energy Act of 2018.	**Yes.** The project would comply with SB100 through its energy-efficient design and increasing renewable electricity generation.
California 2022 Energy Efficiency Standards for Residential and Nonresidential Buildings—Green Building Standards Code, California Code of Regulations, Title 24.	**Yes.** The project would comply with the California Green Building Code through conformance with the California Building Standard Codes.

TABLE 5.5-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
Imperial County General Plan (Renewable Energy and Transmission Element, Goal 1).	**Yes.** The project would comply with Goal 1 outlined in the Renewable Energy and Transmission Element of the Imperial County General Plan since the project would utilize renewable energy resources.

5.5.4 Conclusions and Recommendations

As discussed above, the project would have a less than significant impact related to solid waste management and would conform with applicable LORS.

5.5.5 Proposed Conditions of Certification

There are no proposed conditions of certification for Efficiency and Energy Resources.

5.5.6 References

CDOC 2023a – California Department of Conservation (TN 250207). Geothermal Resource Evaluation, dated May 18, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

HRP1 2024i – Hudson Ranch Power 1 (TN 254691). Hudson Ranch Power 1 Comments - Morton Bay Geothermal Project Impact Screening Study, dated February 26, 2024. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

HRP1 2024j – Hudson Ranch Power 1 (TN 255704). Hudson Ranch Power 1 Comments - Morton Bay Geothermal Project Resource Adequacy Questions, dated April 15, 2024. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

IID 2018 – Imperial Irrigation District Integrated Resource Plan. Accessed on: September 12, 2023. Accessed online at: https://www.iid.com/home/showpublisheddocument/9280/636927586520070000

IID 2022 – Power Content Label Imperial Irrigation District. Accessed on: September 12, 2023. Accessed online at: https://www.iid.com/energy/renewable-energy/power-content-label

Imperial 2015 – RENEWABLE ENERGY AND TRANSMISSION ELEMENT COUNTY OF IMPERIAL GENERAL PLAN. Accessed on: September 20, 2023. Accessed online at: https://www.icpds.com/assets/planning/renewable-energy-and-transmission-element-2015.pdf

Jacobs 2023a – Jacobs (TN 249723). Morton Bay Geothermal Project Application for Certification, Volume 1, dated April 18, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Jacobs 2023kk – Jacobs (TN 253188). Morton Bay Geothermal Project Revised General Arrangement Refinement, dated November 17, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Jacobs 2023r – Jacobs (TN 250042). Morton Bay Geothermal Project Adequacy Report, dated May 8, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Jacobs 2024s – Jacobs (TN 256064). Morton Bay Geothermal Project Responses to Informal Data Request Set 1, dated April 30, 2024. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

5.6 Geology, Paleontology, and Minerals

Michael Turner

5.6.1 Environmental Setting

The Morton Bay Geothermal Project (MBGP or project) is proposed to be on approximately 51 acres of a 160-acre parcel within the unincorporated area of Imperial County, California approximately six miles southwest of the town of Niland. A small landlocked body of water has been created in between the project site and the Salton Sea between high ground linking Red Island and nearby mud pots to the northeast and the lake shore. This small body of water has formed from the gradual drop in the lake surface elevation in this landlocked area. An approximately three-foot-high berm separates the project site from the landlocked body of water and the Salton Sea. The project site is a former duck hunting club site that was periodically flooded for duck ponds; however, the site has remained dry since approximately 2005.

The proposed MBGP site is in the Imperial County Geothermal Renewable Energy Overlay Zone, established in Imperial County's Renewable Energy and Transmission Element (Title 9, Division 17, Geothermal Ordinance), where approximately 12 geothermal production facilities currently exist, and similar new large-scale geothermal developments are planned. This region of the Imperial Valley is used predominantly for agriculture, geothermal power production, and solar power.

The MBGP would include an approximately 140 megawatts (MW) net output geothermal power plant as well as associated infrastructure including eight new well pads and associated production and injection wells. In addition, the project would also include up to nine temporary laydown and parking areas, two construction crew camps, and up to four borrow pits throughout the region. Most of the laydown and parking areas for the proposed project would be adjacent to the site immediately north and south. The laydown and parking areas, crew camps, and borrow sites may be shared between three proposed projects: the MBGP, and the Black Rock, and Elmore North Geothermal Projects.

The regional and local potential for the occurrence of paleontological, geological, and mineral resources are discussed below under Existing Conditions.

Existing Conditions

Paleontological Resources

Paleontological resources are fossils and fossiliferous deposits consisting of vertebrate fossils, invertebrate fossils, plant, trace fossils and other data. Paleontological resources are considered to be older than recorded human history or middle Holocene (approximately 5,000 radiocarbon years) (SVP 2010).

Fossils are important scientific and educational resources because of their use in documenting the present and evolutionary history of particular groups of now-extinct organisms. Fossils are important in reconstructing the environments in which those organisms lived; in determining the relative ages of the strata in which they occur; and the geologic events that resulted in the deposition of the sediments that buried them. Fossils are considered a nonrenewable scientific resource and are afforded protection under several federal, state, and local laws, ordinances, and regulations because the organisms they represent no longer exist.

Paleontological Potential

The paleontological potential of a geologic unit exposed in a project area is inferred from the abundance of fossil specimens and previously recorded fossil sites in exposures of the unit, or of similar units in similar geological settings. The underlying assumption is that a geologic unit is mostly likely to yield fossil remains in a quantity and of a quality similar to those previously recorded from the unit elsewhere in the region.

The paleontological potential of a geologic unit reflects:

- The potential for yielding abundant or significant vertebrate fossils or for yielding a few significant vertebrate, invertebrate, plant, or trace fossils.
- The importance of recovered evidence for proper stratigraphic interpretation, age determination of a geologic unit, paleoenvironmental and paleoclimatic reconstructions, or for understanding evolutionary processes.

Determining the paleontological potential of a geologic unit helps to determine which units may require mitigation to reduce potential impacts to paleontological resources during the development of the project. In its guidelines for assessment and mitigation of adverse impacts to paleontological resources, the Society of Vertebrate Paleontology (SVP) established the following four categories of paleontological potential of geologic units: high, low, undetermined, and none. These categories are described in more detail in **Table 5.6-1**.

TABLE 5.6-1 DEFINITIONS OF PALEONTOLOGICAL POTENTIAL

Rating	Definition
High	Geologic units from which vertebrate or scientifically important invertebrate, plant, or trace fossils have been recovered are considered to have a High Potential for containing additional scientifically important paleontological resources. Geologic units that contain potentially datable organic remains older than late Holocene, including deposits associated with animal nests or middens, and geologic units which may contain new vertebrate deposits, traces, or trackways, also are classified as having High Potential.
Low	Geologic units with Low Potential are known to produce significant fossils only on rare occasions, and only preserve fossils in rare circumstances such that the presence of fossils is the exception not the rule, for example, basalt flows or recent colluvium.
Undetermined	Geologic units for which little information is available concerning their geologic context (depositional environment, age) and potential to contain paleontological resources are considered to have undetermined potential. The paucity of data is

TABLE 5.6-1 DEFINITIONS OF PALEONTOLOGICAL POTENTIAL	
	usually from a lack of study in that unit or because of high variability in the unit's lithology. Typically, further study is necessary to determine whether these units have High, Low, or No Potential to contain scientifically significant paleontological resources. In cases where no subsurface data are available, paleontological potential can sometimes be determined by strategically located excavations into subsurface stratigraphy.
None	Geologic units with No Potential are those that formed at high temperatures and pressures, deep within the Earth, such as plutonic igneous rocks, and high-grade metamorphic rocks. Since the environment in which these rocks formed is not conducive to the preservation of biological remains, they do not contain fossils. Manmade fill also is considered to possess no paleontological potential.

Geological Resources

Regional Geology

The project site is in the south-central portion of the Salton Trough, a topographic and structural depression within the Colorado Desert geomorphic province, a low-lying barren desert basin between active branches of the alluvium-covered San Andreas fault, with the southern extension of the Mojave Desert province in the east. This province is bounded to the east by the Chocolate Mountains, to the west by the Peninsular Ranges, and extends south into Mexico, including a large portion of Imperial County and a small portion of central Riverside County. The Colorado Desert is divided into two main valleys, the wider Imperial Valley to the south and the narrower and shallower Coachella Valley to the north.

Roughly 2,000 square miles of the Salton Trough lie below sea level and can be considered a landward extension of the depression filled by the Gulf of California. However, during the past five million years, the ancestral and modern-day Colorado River has cut down through the Colorado Plateau, carrying the eroded sediment load southward, resulting in deposition of a sediment dam (the Colorado River delta). The Colorado River delta extends generally east to west across the Salton Trough and separates the Salton Trough from the Gulf of California (Kirby et al. 2007).

The Salton Trough is a tectonically active sedimentary pull-apart basin that occurs at the southern tip of the San Andreas fault system as it steps over into the continental rift zone between the Pacific and North American Plates.

The Salton Trough, south into the Gulf of California, is dominated by a series of smaller scale pull-apart basins of different sizes that connect right-stepping (primarily right-lateral) strike-slip faults oriented generally northwest. This pattern of faulting forms transtensional shear zones where there are structures related to both strike-slip and extension. Tectonically, the formation of the Salton Sea Geothermal Field is influenced not only by the step-over from the San Andreas fault westward to the Imperial fault, but also by the San Jacinto fault zone which runs up the west side of the Salton Sea. The San Jacinto fault zone joins the San Andreas fault approximately 100 miles northwest of the Salton Sea. This step-over impedes the northern movement of the Pacific Plate between

the San Andreas fault and San Jacinto fault zones, transferring most of the northern motion west of the San Jacinto fault zone. This in turn imparts rotation of the land area caught in between fault zones forming two spreading centers within the larger step-over. These two spreading centers are the Salton Sea geothermal area and the Mesquite Basin geothermal area to the southeast (Kaspereit et al. 2016).

The rotation resulting from the step-over impedance of the northern movement of the Pacific Plate creates extension and crustal thinning, facilitates igneous intrusion and volcanism, and dramatically elevates heat flux that supports the region's high grade geothermal systems. The extension has created a complex system involving several unusual observations, including:

- One side of the land region rising while the other is subsiding.
- Different, more northerly, orientation of the Brawley seismic zone.
- Stepping fault lines.
- Geochemical inconsistencies.
- The formation of rhyolite domes. (Kaspereit et al. 2016)

Local Geology and Stratigraphy

The project site, including well pads and linear facilities, is east of the Salton Sea. The Salton Sea covers an area of approximately 360 square miles and is California's largest lake. The surface of the Salton Sea is currently at an elevation of –240 feet below sea level (IID 2023). Red Hill lies west of the site and is one of five small extrusive rhyolite domes arranged along a northeast trend. These domes are estimated to have erupted as recent as approximately 1,800 years before present and are collectively known as the Salton Buttes (Wright et al. 2015). The site is underlain by Holocene-aged lacustrine deposits associated with the ancient Lake Cahuilla. These lacustrine deposits consist of interbedded lenticular and tabular silt, sand, and clay. The late Pleistocene to Holocene-aged lake deposits are probably less than 100 feet thick and derived from periodic flooding of the Colorado River, which intermittently formed the historic freshwater Lake Cahuilla.

Older deposits consist of Miocene- and Pleistocene-aged non-marine and marine sediments deposited in intrusions of the Gulf of California. Basement rock consisting of Mesozoic-aged granite and Paleozoic-aged metamorphic rocks are estimated at depths between 15,000 to 20,000 feet below the ground surface (Jacobs 2023h).

Geological Units in the Project area

The project site is immediately underlain by Quaternary-aged lake deposits locally referred to as Lake Cahuilla beds. Within the western portion of the project area, volcanic deposits (rhyolite domes) also outcrop along the southeastern shore of the Salton Sea. While not mapped at the surface, the Brawley and Borrego Formations underlie Lake

Cahuilla beds and may be encountered at unknown depths during ground disturbance. Thus, these two formations are included in the following assessment.

- Volcanic deposits (rhyolite domes) – Holocene-age volcanic deposits of rhyolite and pumice with subordinate obsidian that form prominent volcanic domes. The high viscosity of silica-rich lava prevents the lava from flowing very far, which results in the formation of a dome (Robinson et al. 1976). The rhyolite domes are arranged along a northeast-southwest trend; however, it is believed that the locations of the domes are controlled by hypothetical centerlines of pull-apart zones between northwest-southeast trending strike-slip faults rather than northeast-southwest fault lineaments (Kaspereit et al. 2016, Jacobs 2023h, Morton 1977).
- Lake Cahuilla beds – Lake Cahuilla beds are Holocene to Pleistocene in age and consist largely of interbedded lacustrine, playa, and fluvial deposits. The lacustrine sediments are composed of Colorado River-derived medium- to very fine-grained sandstone, siltstone, and mudstone. The fluvial deposits are composed mainly of coarse-grained sandstone with minor amounts of gravel from the local mountains. Total thickness of the unit is unknown (Jefferson 2007). The Lake Cahuilla beds generally overlie the Pleistocene Brawley Formation with an angular unconformity. However, there are some locations on the east and south sides of the central Salton Trough where the Brawley Formation and overlying Lake Cahuilla beds are in conformity or paraconformity, making the contact between the two units harder to distinguish (Ross et al. 2020, Jacobs 2023h, Morton 1977).
- Brawley Formation – The Pleistocene-aged Brawley Formation is primarily a lacustrine deposit, but the presence of marine-estuarine fauna within the unit indicates that it was deposited near sea level and flooded with marine waters during sea level highstands (Ross et al. 2020). The Brawley Formation consists of light grayish-green to light yellowish-brown claystone and interbeds of buff-colored sandstone. The Brawley Formation overlies the Pliocene Borrego Formation. The Brawley Formation is lithologically distinguished from the underlying Borrego Formation by the coarse-grained intervals of sandstone and gravel (Jacobs 2023h, Morton 1977).
- Borrego Formation – The Pliocene-aged Borrego Formation is a regionally extensive deposit of lacustrine claystone, mudstone, and marlstone with minor amounts of sandstone and siltstone (Lutz 2005, Jacobs 2023h, Morton 1977).

Subsurface Soils

The subsurface soils encountered during the field exploration conducted on September 28 and 29, 2022 performed as part of the preliminary geotechnical investigation consist of approximately 18 feet of near surface medium stiff to very stiff fat clays. Medium dense silty sands and silts were encountered from 18 to 22 feet below the ground surface. Stiff clays were encountered at depths of 24 to 50 feet below the ground surface. Medium dense silty sands extend from 50 to 56 feet below the ground surface. Stiff clays were encountered at depths of 56 to 72 feet below the ground surface (Jacobs 2023h). An 8-foot thick medium dense to dense sand layer was observed between 72 to 80 feet below the ground surface. Interbedded layers of loose to medium dense silts/silty sands and

stiff to very stiff clays were encountered from 80 to 100 feet, the maximum depth of cone penetration testing (Jacobs 2023h).

Faulting and Seismicity

The tectonic setting of this area of southern California is complex and is made up of numerous fault systems, including right and left lateral strike-slip, oblique, thrust, and blind thrust faults. Therefore, any specific location within the area is subject to seismic hazards of varying degrees, depending on the proximity to and length of nearby active faults and the local geologic and topographic conditions. Seismic hazards primarily include seismic shaking and ground rupture along fault traces and strong ground shaking induced liquefaction. The project site and project features, including the plant itself, wells, well pads, pipelines and gen-tie lines, are located in one of the most seismically active portions of southern California. The region has experienced numerous earthquakes in the past and is likely to do so in the future.

The California Geological Survey (CGS) has established Earthquake Fault Zones in accordance with the 1972 Alquist-Priolo Earthquake Fault Zone Act. The Earthquake Fault Zones consist of boundary zones surrounding well defined active faults or fault segments. The project site does not lie within a mapped Alquist-Priolo Earthquake Fault Zone. However, the northeast corner of the 160-acre parcel is in the general alignment of the Mullet lineament as evidenced by a string of carbon dioxide (CO_2) mud pots and mud volcanos in a northwest-southeast orientation.

The Mullet lineament is not formally recognized as a fault by CGS and is not a mapped Alquist-Priolo Earthquake Fault Zone (Jacobs 2023h, Lynch et al. 2008). The Mullet lineament is also identified in the literature as the Calipatria fault. The Calipatria fault was identified using infrared detection (Babcock 1971) and the alignment of thermal hot springs (Muffler and White 1968). In 1972, Meidav and Furgerson suggested that this line might indicate the location of a fault that they called the Calipatria fault (Meidav and Furgerson 1972).

San Andreas Fault Zone

The San Andreas fault zone extends from the Gulf of California in Mexico to the Mendocino coast in northern California and accommodates the majority of movement between the Pacific and North American plates. The San Andreas fault is typically mapped as ending at Bombay Beach, approximately 13 miles north of the project area. A seismically active zone referred to as the Brawley seismic zone accommodates tectonic stress between the San Andreas fault and the Imperial fault, approximately 16.5 miles southeast of the project site. The San Andreas fault is the eastern bounding fault zone of the Salton Trough. Several active faults along the section of the San Andreas in proximity to the project site are not generally considered to be independent seismic sources, but rather to experience movement triggered by seismic events on the San Andreas. CGS estimates the slip rate as greater than 25 millimeters per year and a maximum moment magnitude of 7.2 (Jacobs 2023h).

Brawley Seismic Zone

The proposed plant site, well pads, and linear facilities are within the Brawley seismic zone. The Brawley seismic zone is a pull-apart basin between the northern end of the Imperial fault and the southern end of the San Andreas fault. It is a tectonically active area. The Brawley seismic zone is composed of numerous northwest-southeast trending strike-slip faults and northeast-southwest cross-cutting high angle normal faults.

The Brawley seismic zone was also the source of the 1981 5.9 Moment Magnitude (Mw) Westmorland earthquake sequence that involved activity on at least seven distinct fault planes within the zone. An earthquake swarm with eleven earthquakes above magnitude 4.0 (the largest being 5.5 Mw) occurred approximately 2 miles northwest of Brawley, California between August 26-28, 2012. Although there was no evidence of surface rupture associated with this event, numerous structures in Brawley were damaged. The faults in the Brawley seismic zone are considered to be short enough that earthquakes much larger than 6.0 Mw are unlikely. CGS considers the Brawley seismic zone to have a maximum magnitude of 6.4 Mw with a very short 24-year average return interval. The cumulative slip rate across the Brawley seismic zone has been reported to range from slightly above 5 millimeters per year (mm/year) up to 25 mm/year. (Jacobs 2023a, Jacobs 2023h). The Mullet lineament/Calipatria fault, described above, lies within the Brawley seismic zone.

San Jacinto Fault Zone

The San Jacinto fault zone is approximately 16 miles west of the project site and is the western bounding fault zone of the Salton Trough. This zone is a major tectonic and seismic structure, striking northwest for more than 130 miles. The San Jacinto fault zone is a component of the larger San Andreas fault system. The southern segment of the San Jacinto fault zone is composed of the Coyote Creek fault, the Superstition Hills fault, and the Superstition Mountain fault. The most recent large earthquake to occur on the San Jacinto fault system was the 1954 Arroyo Salada earthquake, which has a recorded magnitude of 6.4 Mw. (Jacobs 2023a, SCED 2023). The California Division of Mines and Geology fault estimated parameters for the San Jacinto fault zone are given for each segment as follows (Jacobs 2023h):

- Coyote Creek – 4 mm per year slip rate and maximum Mw of 6.8
- Superstition Hills - 5 mm per year slip rate and maximum Mw of 6.6
- Superstition Mountain - 5 mm per year slip rate and maximum Mw of 6.6

Imperial Fault Zone

The Imperial fault zone is approximately 16.5 miles southeast of the project site. This northwest-trending fault is approximately 40 miles long and extends southeastward from an area just southwest of the city of Brawley to the town of Saltillo, Mexico. Fault parameters for the Imperial fault indicate a slip rate of 20 mm per year and a maximum estimated Mw of 7.0 (Jacobs 2023a).

Strong Ground Motion

The project site is not within an active fault zone as defined by the Alquist-Priolo Act. However, it is in an area that is subject to ground shaking from earthquakes generated on faults associated with the San Andreas fault zone, San Jacinto fault zone, the Imperial fault zone, and Brawley seismic zone in which the project site lies. Shaking from an earthquake can result in structural damage and can trigger other geologic hazards such as liquefaction. Ground shaking is controlled by the earthquake magnitude, duration, and distance from the source. Ground conditions also influence impacts from strong ground motions. Local soil conditions may amplify or dampen seismic waves as they travel from the underlying bedrock to the ground surface.

Ground motions for the project site were calculated by the project owner using the 2022 California Building Code (CBC) and the American Society of Civil Engineers (ASCE) standards in ASCE 7-16, Section 11.4.8, seismic parameters.

According to available information and the calculated peak ground acceleration (PGA) values, the project site would likely be categorized as alluvium, PGA of 0.61 g. PGA values across California range from about 0.1 g to more than 1.0 g. More than three-fourths of the population of the state resides in counties with seismic hazard calculated to be greater than 0.4 g (CDOC and USGS 1996).

Mineral Resources

In the context of the California Environmental Quality Act (CEQA), mineral resources are land areas or deposits deemed significant by the California Department of Conservation (CDOC). A mineral resource is a concentration of natural inorganic materials or fossilized organic material occurring in such form, quantity, or quality that there are reasonable prospects for economic extraction. Inorganic mineral resources include non-fuel materials such as aggregate (sand and gravel), metals (gold, silver, and iron), and industrial minerals (clays, limestone, and gypsum). Petroleum resources include crude oil and natural gas.

Historic mining in Imperial County dates to the 1880s and has included such mineral resource extraction a multitude of minerals. Extracted minerals include gypsum, sand, gravel, gold, manganese, natural carbon dioxide, pumice, crushed stone, sericite mica, silver, tungsten, strontium, kyanite, optical calcite, copper, limestone, barite, borate, clay, claystone, lead, salt, potash, sodium sulphate, calcium chloride, silica, uranium, gemstones, and nickel (CDMG 1977).

Mineral resources currently being extracted in Imperial County include gold, gypsum, sand, gravel, lime, clay, claystone, kyanite, limestone, sericite, mica, tuff, salt, potash, and manganese (Imperial County 2016).

The 2020 state production report prepared by CGS identified the following mines and explorations in Imperial County:

- A gypsum mine along the western border of the county.
- A gold and silver mine in the southern portion of the county.
- Explorations for lithium along the Salton Sea.
- Gold extraction at the Southern Empire and Kore Imperial Mines in the southern portion of the county (CGS 2020).

The State Mining and Geology Board (SMGB) is responsible for administration of a mineral lands inventory process termed classification designation. Areas are classified based on geologic factors without regard to existing land use and land ownership. The SMGB has established Mineral Resources Zones throughout California; however, there are no Mineral Resources Zones mapped in Imperial County (CGS 2022).

The CDOC created the Mineral Resources Project to organize active and historic mining data, as mandated by the Surface Mining and Reclamation Act (SMARA) and to provide information about California's non-fuel mineral resources (CDOC 2023b). Under the project, CGS classifies lands that contain regionally significant non-fuel mineral resources and then develops objective maps and reports to be used by mining companies and consultants, government agencies, and the public to recognize, utilize, and protect California's mineral resources. However, according to the SMARA website, SMARA classification and mapping has not occurred in Imperial County (CGS 2022).

The Division of Mine Reclamation's list of mines, referred to as the AB 3098 List and regulated under SMARA, lists 30 mines in Imperial County; however, the closest mines to the project site are two open-pit gravel mines approximately 8-miles northeast. (CDOC 2016, CDOC 2023c). Historically, minor aggregate (pumice) mining operations have been documented at the volcanic outcrops west and southwest of the project site at Rock Hill and Obsidian Butte.

No known commercial petroleum deposits are within two miles of the project site. There are two wells that were drilled for gas exploration approximately one mile east and one mile southeast of the project site. These wells are reported drilled and closed in 1935 and 1933, respectively. These wells were exploratory in nature and are reported as abandoned with cement. According to the online CDOC Geologic Energy Management Division (CalGEM) Well Finder Interactive Map, there are numerous active, idle, and abandoned geothermal, mineral extraction, water, and injection wells within two miles of the project site (CDOC 2023d). According to the United States Geological Survey (USGS) Mineral Resources online spatial data interactive map, exploration for boron and borates within geothermal fluids occurred at three locations on parcels adjacent to the east and west of the project site in the mid-1960s (USGS 2011).

CO_2 gas was produced north of the project site from 1933 to 1954 from shallow sands 200 to 700 feet below the ground surface. Historically, the CO_2 recovered from these shallow wells was used to produce dry ice (Robinson et al. 1976).

Several issues influence the extraction of mineral resources in Imperial County, including the location of geologic deposition, the potential for impacts to the environment, commercial value, and land use conflicts. As a result, the extraction of mineral resources is limited to a relatively small number of sites throughout the County. In addition, at the project site, the geologic units at the surface and in the subsurface are widespread alluvial deposits that occur throughout the Imperial Valley; these units are not unique in terms of commercial value. Thus, the potential for rare recreational, commercial, or scientific deposits is very low.

Regulatory

The project would be required to comply with all applicable federal, state, and local laws, ordinances, regulations, and standards (LORS) and would need to obtain building permits that would be issued by the California Energy Commission (CEC). The issuance of the building permits and oversight provided by the CEC via the CEC's delegate chief building official (DCBO) would confirm that the project complies with the applicable regulatory framework.

Federal Geologic and Mineral Resources

No federal regulations related to geologic or mineral resources apply to the project facility design.

Federal Paleontological Resources

No federal regulations related to paleontological resources apply to the project facility design.

State Geologic and Mineral Resources

California Public Resources Code 25523(a): 20 CCR § 1252 (b) and (c)

Surface Mining and Reclamation Act of 1975, PRC, Division 2, Chapter 9, Section 2710 et seq.

The Surface Mining and Reclamation Act of 1975, Public Resources Code (PRC), Division 2, Chapter 9, Section 2710 et seq. SMARA provides a comprehensive surface mining and reclamation policy for the regulation of surface mining operations to assure that adverse environmental impacts are minimized and mined lands are reclaimed to a usable condition. SMARA also encourages the production, conservation, and protection of the State's mineral resources. PRC Section 2207 provides annual reporting requirements for all mines in the state, under which the State Mining and Geology Board is also granted authority and obligations.

The county enacts ordinances to implement SMARA at the local level and to act as lead agency for the issuance of permits, development of reclamation plans, and is the holder of reclamation financial assurances. SMARA would only be applicable to borrow pits.

However, the project owner has indicated they will be requesting a one-time exemption for the borrow pits consistent with the SMARA (PRC Section 2714[f]).

Title 14, CCR, Division 2, Chapter 8, Subchapter 1, State Mining and Geology Board Reclamation Regulations, Section 3500 et seq.

SMARA, Chapter 9, Division 2 of the PRC, requires the State Mining and Geology Board to adopt state policy for the reclamation of mined lands and the conservation of mineral resources.

These policies are prepared in accordance with the Administrative Procedures Act, (Government Code) and are found in California Code of Regulations, Title 14, Division 2, Chapter 8, Subchapter 1.

The administering agency for this authority is the Imperial County Planning/Building Department.

California Building Code

The California Building Code (CBC) prescribes standards for constructing safer buildings. The CBC contains provisions for earthquake safety based on factors including occupancy type, soil and rock profile, ground strength, and distance to seismic sources. The CBC requires that a site-specific geotechnical investigation report be prepared for most development projects to evaluate seismic and geologic conditions, such as surface fault ruptures, ground shaking, liquefaction, differential settlement, lateral spreading, expansive soils, and slope stability. The CBC is updated every three years, with the 2022 CBC effective on January 1, 2023.

The design of the proposed buildings, structures, and infrastructure would be required to comply with CBC requirements.

State Paleontological Resources

The CEQA lead agency having jurisdiction over a project is responsible for ensuring that paleontological resources are protected in compliance with CEQA and other applicable statutes. The lead agency with the responsibility to ensure that fossils are protected during construction is the CEC. PRC Section 21081.6, entitled Mitigation Monitoring Compliance and Reporting, requires that the CEQA lead agency demonstrate project compliance with mitigation measures developed during the environmental impact review process.

Other state requirements for paleontological resource management are in California PRC Section 5097.5 and 5097.9 entitled Archaeological, Paleontological, and Historical Sites. This statute protects historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological sites, or any other archaeological, paleontological, or historical feature that is situated on land owned by, or in the jurisdiction of, the state of California, or any city, county, district, authority, or public corporation, or any agency thereof. PRC

Section 5097.5/5097.9 does not apply to the project because it lies entirely on private property.

Local Geologic and Mineral Resources

Imperial County General Plan, Renewable Energy and Transmission Element

The Renewable Energy and Transmission Element of the Imperial County General Plan serves as the primary policy statement by the Board of Supervisors for implementing development policies for geothermal and other renewable energy land uses in Imperial County. The element also addresses transmission as an interrelated activity that needs to be considered when reviewing renewable energy projects.

Under the element, Imperial County has developed goals and objectives relative to renewable energy project development within the unincorporated areas of the county. The goals are intended to serve as long-term principles and policy statements representing ideals which have been determined by the Board of Supervisors as being desirable and deserving of community time and resources to achieve. The goals and objectives are important guidelines for renewable energy projects and related land use decision-making.

See the Renewable Energy and Transmission Element of the Imperial County General Plan for more information. (Imperial County 2015).

The project incorporates engineered grading and drainage plans to minimize grading and assure appropriate drainage of the facility. Additionally, mitigation measures, including sediment and erosion control during grading and construction activities, would be implemented to minimize environmental impacts related to erosion and sediment transport. Geothermal production is compatible with agricultural uses, and for which the county has established goals and objectives to lessen agricultural impacts. The project, as proposed, complies with the goals and objectives of the Renewable Energy and Transmission Element.

Local Paleontological Resources

The Imperial County General Plan serves as the primary policy statement by the County Board of Supervisors for implementing development policies and land uses. The General Plan does not have any requirements specific to paleontological resources. However, paleontological resources often are considered a subcategory of prehistoric or cultural resources and are certainly considered significant natural or scientific resources. Thus, the following elements of the Imperial County General Plan may apply to paleontological resources.

The Conservation and Open Space Element of the General Plan contains requirements for cultural resources that involve the identification and documentation of significant historic and prehistoric resources and the preservation of representative and worthy examples. The Conservation and Open Space Element also recognizes the value of historic and

prehistoric resources or sites of scientific value and the need to assess current and proposed land uses for impacts upon these resources.

Goals and Objectives, as stated in the Land Use Element of the General Plan, provide direction for private development and guidelines for land use decision making. These Goals and Objectives repeatedly mention preserving natural resources and the natural environment and avoiding adverse environmental impacts. (Imperial County 2016)

The project would achieve these objectives with the implementation of the mitigation measures specified in Section 5.6.5.

Paleontological Resources Professional Standards

The Society of Vertebrate Paleontology (SVP), an international organization of professional paleontologists, has established guidelines and standard procedures that outline acceptable professional practices in the conduct of paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation (SVP 2010). This assessment was prepared in accordance with these guidelines.

Cumulative

Geologic and Mineral Resources

The proposed project may have cumulative impacts if the incremental effect of the project is considerable when viewed in connection with other past, present, and reasonably foreseeable future projects. (PRC Section 21083; California Code of Regulations [CCR] Title 14, Sections 15064[h], 15065[c], 15130, and 15355).

Cumulative impacts of the project on geologic hazards and resources of geothermal development from the extraction of geothermal fluids, in connection with current and other reasonably foreseeable geothermal projects, were considered by the project owner. The project operations would include reinjection of geothermal fluids, which would be closely monitored at the project site. Additionally, the project would be required to comply with the seismic and subsidence monitoring requirements of the Imperial County General Plan, Geothermal Element.

Paleontological Resources

Development in the Imperial Valley and Salton Sea area has resulted in cumulative impacts on paleontological resources. The extensive nature of these cumulative impacts is from this extensive development combined with the widespread presence of fossiliferous sedimentary units in the region. However, measures typically implemented pursuant to state statutes serve to mitigate these impacts through the recovery of the scientific and educational potential of the affected paleontological resources. Although not all projects are subject to CEQA review, and only a portion of those incorporate paleontological protection measures, application of paleontological monitoring and

mitigation measures is common and, therefore, mitigates the cumulative and direct impacts of continued development.

The potential of the project to contribute to cumulative impacts on paleontological resources is considered low with appropriate mitigation measures implemented. Therefore, the contribution of the project to cumulative negative impacts on paleontological resources would not be significant.

5.6.2 Environmental Impacts and Mitigation

TABLE 5.6-2 ENVIRONMENTAL IMPACTS AND MITIGATION SUMMARY

GEOLOGY, PALEONTOLOGY, AND MINERALS Would the project:	**Significant and Unavoidable**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☒	☐
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii. Strong seismic ground shaking?	☐	☒	☐	☐
iii. Seismic-related ground failure, including liquefaction?	☐	☒	☐	☐
iv. Landslides?	☐	☐	☒	☐
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c. Be located on geologic units or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☒	☐	☐
d. Be on expansive soil, as defined in Section 1803.5.3 of the California Building Code (2022), 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 waste water?	☐	☐	☒	☐

TABLE 5.6-2 ENVIRONMENTAL IMPACTS AND MITIGATION SUMMARY				
GEOLOGY, PALEONTOLOGY, AND MINERALS Would the project:	**Significant and Unavoidable**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
g. 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?	☐	☐	☒	☐
h. 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?	☐	☐	☒	☐

Environmental checklist established by CEQA Guidelines, Appendix G, geology and soils and minerals. *Geology and Soils question (d) reflects the current 2022 California Building Code (CBC), effective January 1, 2023, which is based on the International Building Code (2021).

5.6.2.1 Methodology and Thresholds of Significance

To assess potential impacts on unique geologic features and effects on mineral resources, staff has reviewed geologic and mineral resource maps for the surrounding area, as well as site-specific information provided by the project owner, to determine if geologic and mineralogic resources exist in the area. The geologic map and literature review included maps published by the California Geologic Survey (Jenkins 1967) and Norris and Webb (Norris and Webb 1990).

The current CBC (CBC 2022) provides geotechnical and geological investigation and design guidelines that engineers shall follow when designing a facility. Thus, the criterion used to assess the significance of a geologic hazard includes evaluating each hazard's potential impact on the design, construction, and operation of the proposed facility. Geologic hazards include faulting and seismicity, liquefaction, dynamic compaction, hydrocompaction, subsidence, expansive soils, landslides, tsunamis, seiches, and others as may be dictated by site-specific conditions.

To develop a baseline paleontological resources inventory of the project study area, which includes the proposed project footprint and a one-mile buffer, published and available unpublished geological and paleontological literature was reviewed. Sources included geological maps, satellite photography, technical and scientific reports, and electronic databases. The potential paleontological productivity of stratigraphic units that may be affected by project implementation was developed through a paleontological resources records search. For this project, a paleontological resources records review was conducted using the online database maintained by the University of California Museum of Paleontology at Berkeley (UCMP 2023). A records search also was conducted by Dr.

Lyndon Murray, district paleontologist for the Colorado Desert District Stout Research Center at Anza-Borrego Desert State Park.

A pedestrian field survey of the study area was conducted by the applicant from April 24 through 26, 2022. The field survey was conducted to ground truth the results of the literature review and geologic mapping, and to directly evaluate the paleontological potential of the geologic units within the study area. (Jacobs 2023a)

5.6.2.2 Direct and Indirect Impacts

An assessment of the potential impacts to geologic, mineralogic, and paleontologic resources, and from geologic hazards is provided below. The conditions of certification are the mechanism by which the CEC mitigates potential impacts and maintains ongoing compliance with LORS applicable to geologic hazards and the protection of geological, paleontological, and mineral resources.

a. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

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

Construction

Less Than Significant Impact. Ground rupture is caused when an earthquake event along a fault creates rupture at the surface. The probability that construction of the proposed project would have an impact on the risk of loss, injury, or death involving rupture of an earthquake fault during construction is low. The project site is within a seismically active region of southern California with nearby historically active faults including the San Andreas fault zone, approximately 13 miles to the north, the San Jacinto fault zone, approximately 16 miles to the west, and the Imperial fault zone, approximately 16.5 miles to the southeast. More specifically, it is within the tectonically active Brawley seismic zone between the northern end of the Imperial fault and the southern end of the San Andreas fault. The Brawley seismic zone is characterized by earthquake swarms with magnitudes up to 5.5 Mw. CGS considers the Brawley seismic zone to have a maximum magnitude of 6.4 Mw with a very short 24-year average return interval. The cumulative slip rate across the Brawley seismic zone has been reported to range between greater than approximately 5 mm/year up to 25 mm/year. (Jacobs 2023a, Jacobs 2023h).

The Preliminary Geotechnical Investigation prepared by Landmark Geo-Engineers and Geologists, dated October 20, 2022, Section 3.7 Seismic and Other Hazards, indicates that the plant site is within the general alignment of the Mullet lineament as evidenced by CO_2 mud pots and mud volcanos in the area (Jacobs 2023h). The mud pots and mud volcanos are visible from the ground surface as well as in aerial photographs adjacent to

the site at Mullet Island, approximately 1.3 miles to the northwest and on the parcel directly east of the property. An imaginary line projected through these mud pots and mud volcanoes would cross the northeast corner of the property in a northwest-southeast orientation. The Mullet lineament is not formally recognized as a fault by the CGS and is not a mapped Alquist-Priolo Earthquake Fault Zone. (Jacobs 2023h, Lynch et al. 2008).

Due to the distance to known and mapped faults and projected Mullet lineament from the plant's facilities positioned in the southern and southwestern portions of the property, the development of the project would not expose people or buildings to known risks of fault rupture. Given this, the impact would be less than significant.

Operation

Less Than Significant Impact. The probability that the operation or maintenance of the proposed project would have an impact on the risk of loss, injury, or death involving rupture of an earthquake fault during operation is remote. Since there are no mapped Alquist-Priolo Special Studies Zones crossing the project site and the Mullet lineament is limited to a projection crossing the northeastern corner of the property, the zone of damage related to a fault surface rupture are limited to the northeastern corner of the property, the impact would be less than significant.

ii. Strong seismic ground shaking?

Construction

Less Than Significant Impact with Mitigation Incorporated. The project site is not within a mapped active fault zone as defined by the Alquist-Priolo Act. However, the project site is subject to ground shaking from earthquakes generated on faults associated with the San Andreas fault zone to the east, the San Jacinto fault zone to the west, the Imperial fault zone to the southeast, and the Brawley seismic zone in which the site is located. Shaking from an earthquake can result in structural damage and can trigger other geologic hazards such as liquefaction.

The final design of the project would include an assessment of the potential impacts of strong seismic ground shaking from a site-specific design-level seismic event. Seismic hazards would be minimized, to the extent feasible, by conformance to the applicable seismic design criteria of the CBC (CBC 2022). Furthermore, recommendations for ground improvement to further reduce, to the extent feasible, the ground settlement hazard at the site would be provided in a site-specific design-level geotechnical investigation report and incorporated into the project design.

A final project-specific geotechnical engineering report would be provided to the CEC for review and approval prior to the issuance of a building permit, and the project would be required to comply with all recommendations in this report when constructing the project. With the implementation of seismic design criteria per the current CBC (CBC 2022), as well as the anticipated project-specific recommendations in the final geotechnical

engineering report, the project would not expose people or property, directly or indirectly, to significant impacts associated with strong seismic ground shaking.

Operation

Less Than Significant Impact. During the operation and maintenance of the proposed project, the project facility could be subject to strong seismic ground shaking. However, with the implementation of the seismic design guidelines per the current CBC (CBC 2022), as well as the anticipated project-specific recommendations in the final geotechnical engineering report, the project would not expose people or property, directly or indirectly, to significant impacts associated with geologic or seismic ground shaking. Therefore, the impacts of the project on the safety of people or structures from strong seismic ground-shaking would be less than significant.

iii. Seismic-related ground failure, including liquefaction?

Construction

Less Than Significant Impact with Mitigation Incorporated. Liquefaction is a phenomenon in which saturated, cohesionless soils, such as sand and silt, temporarily lose their strength and liquefy when subjected to dynamic forces, such as intense and prolonged ground shaking. To be susceptible to liquefaction, potentially liquefiable soils must be saturated or nearly saturated. In general, liquefaction hazards are most severe in saturated soils within the upper 50 feet of the ground surface. The potential for liquefaction increases with shallower groundwater conditions. The potential hazards associated with liquefaction are ground deformation and lateral spreading.

Depth to groundwater measured during the preliminary geotechnical investigation conducted at this property (Jacobs 2023h) was reported at 3.5 to 5 feet below the ground surface. Borings advanced to a maximum depth of 76.5 feet below the ground surface identified subsurface material consisting of saturated silts and silty sands. The findings of the preliminary geotechnical investigation (Jacobs 2023h) concluded that liquefaction can occur within several isolated silt and sand layers between depths of 8 to 50 feet below the ground surface. A summary of the depths to the first liquefiable zones observed and the associated potential induced settlement is shown in the table below.

TABLE 5.6-3 DEPTHS TO THE FIRST LIQUEFIABLE ZONES

Exploration Location	Depth of First Liquefiable Zone (ft)	Potential Induced Settlement (in)
CPT-1	18	¾
CPT-2	8.5	¼
CPT-3	20	1

Source: Jacobs 2023h

According to the preliminary geotechnical investigation (Jacobs 2023h) at location CPT-2, liquefaction is estimated to occur at a depth of about 8.5 feet, but the liquefiable layer is estimated to only be 0.1 ft. thick and laterally discontinuous. Therefore, this thin layer is not considered to pose a liquefaction risk.

Based on empirical relationships, the total settlement is estimated to be about one inch should liquefaction occur. Differential settlement is estimated at one-half of the total potential settlement. Accordingly, there is a potential for one half inch of liquefaction induced differential settlement at the project site. The differential settlement based on seismic settlements is estimated at one inch over a distance of 200 feet (Jacobs 2023h).

Because of the depth of the other liquefiable layers and the presence of an approximately 18-foot-thick non-liquefiable clay layer across the site acting as a bridge over the liquefiable layers, a fairly uniform ground surface settlement would occur in the event of liquefaction. Therefore, a wide area subsidence of the soil overburden would be the expected effect of liquefaction rather than bearing capacity failure of the proposed structures.

The proposed structures would be designed and constructed in accordance with applicable provisions of the CBC (CBC 2022) that are designed to address liquefaction concerns to the extent feasible.

In addition, a project-specific design would be included within a geotechnical engineering report and provided to the CEC for review and approval prior to the issuance of a permit, The project would be required to comply with all recommendations in this report when constructing the project. Therefore, with the implementation of the seismic design criteria for ground failure and the anticipated project-specific recommendations in the final geotechnical engineering report, the project would not expose people or property to any significant direct or indirect impacts associated with geologic or seismic conditions onsite, including liquefaction.

Operation

Less Than Significant Impact. During the operation and maintenance of the proposed project the facility could be subject to strong seismic ground shaking (Jacobs 2023a). However, by implementing the seismic design guidelines per the current CBC (CBC 2022), as well as the project-specific recommendations in the final geotechnical engineering report, the project would not expose people or property, directly or indirectly, to significant impacts associated with the effects of seismic ground shaking, such as ground failure, liquefaction, or subsidence. Therefore, risks to people or structures from strong seismic ground shaking would continue to be less than significant.

iv. Landslides?

Construction

Less Than Significant Impact. A landslide is a mass of rock, soil, or debris that has been displaced downslope by sliding, flowing, or falling. There is a low probability for landslides in the project area because of the relatively flat topography (0 to 1% slope) and distance from hills, mountains, or slopes. The project site is not within a landslide hazard area, as indicated by a California Landslide Susceptibility Map prepared by CGS (CDOC 2021).

Because the project site is flat, land sliding is unlikely, so the potential for direct impact from mass wasting at the site is considered low.

Operation

Less Than Significant Impact. As the project site is relatively flat with no open faces or slopes near the site, there is low potential for landslides. Construction, operation, and maintenance of the project would not change the general surface morphology of the site. Therefore, no direct or indirect significant impacts associated with landslides are expected to occur.

b. Would the project result in substantial soil erosion or the loss of topsoil?

Construction

Less Than Significant Impact. Construction activities associated with the project (including excavation, trenching, and grading) would temporarily increase sedimentation and erosion by exposing soils to wind and runoff until construction is complete and new vegetation is established. The project would be subject to construction-related storm water permit requirements. By complying with these permits and other applicable laws and regulations, substantial soil erosion or loss of topsoil would not occur; and runoff from the project site would not violate the applicable waste discharge requirements or otherwise contribute to the degradation of storm water runoff quality. Therefore, impacts related to erosion and loss of topsoil would be less than significant.

Operation

Less Than Significant Impact. Erosion and sedimentation best management practices implemented to comply with the construction-related storm water permit would ensure the site would not include areas of exposed topsoil subject to erosion. Furthermore, during operation, the MBGP plant facility would be surrounded by an approximately five-foot-high earthen berm, in accordance with the county's flood protection requirements. The perimeter berm and interior stormwater retention pond are designed to control potential flooding events at the site. Therefore, impacts related to erosion and loss of topsoil from operations and maintenance activities would be less than significant.

c. Would the project be located on geologic units 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?

Construction

Less Than Significant Impact with Mitigation Incorporated. The project would not be 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. This is because the project owner is required to follow the CBC

(CBC 2022) plus any local amendments, which requires that a final geotechnical report is prepared and the building design adheres the final report findings, per the CBC. Therefore, impacts associated with construction on geologic units or soil that could become unstable would have a less than significant impact.

Operation

Less Than Significant Impact. Operation and maintenance activities would not change the surface runoff or geotechnical characteristics of the material beneath the project facilities. Thus, operation and maintenance activities would not introduce new soil stability hazards. Occasional minor surface disturbance may continue to be required during maintenance activities, but such disturbance would be temporary and likely small. Project operation and maintenance would not expose people or property, directly or indirectly, to unstable geologic or soil units. Therefore, operation and maintenance activities would have a less than significant impact.

d. Would the project be located on expansive soil, as defined in Section 1803.5.3 of the California Building Code (2022), creating substantial direct or indirect risks to life or property?

Construction and Operation

Less Than Significant Impact with Mitigation Incorporated. Expansive soils shrink and swell with wetting and drying. Potential causes of moisture fluctuations include drying during construction, and subsequent wetting from rain, capillary rise, landscape irrigation, and type of plant selection. If untreated, expansive soils could damage future buildings and pavements on the project site. Expansive soils, if present, can be readily mitigated by either soil amendments or by removal and replacement with non-expansive soils, among other methods. Subsurface soils encountered at the site during the 2022 preliminary geotechnical investigation logged the presence of clay-rich soils from 5 feet to 100 feet below the ground surface during field activities. These native soils likely exhibit high swell potential (Jacobs 2023h) and will be further evaluated during design-level geotechnical investigations.

The project site is on expansive soil as defined in Section 1803.5.3 of the CBC (CBC 2022). The project would be required to adhere to the CBC, which would reduce impacts related to expansive soils to a less than significant level. Therefore, risks to people or structures from expansive soil would be less than significant.

e. Would the project 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?

Construction and Operation

Less Than Significant Impact. Due to the low infiltration rates of the on-site clay soils as identified in the Preliminary Geotechnical Report as 240 minutes per inch or greater

(Jacobs 2023f), traditional infiltrative leach field practices are not viable. The project plans to utilize an evapotranspiration (E-T) bed for sanitary wastewater effluent disposal downstream of a traditional septic tank. The E-T Bed approach was verified as an acceptable alternative disposal approach by the Regional Water Quality Control Board and was preliminarily designed following Environmental Protection Agency recommended sizing guidelines based on local rainfall and evapotranspiration rates and zero infiltration of the site soils.

The system would be permitted and constructed in conformance with the state of California and Imperial County regulations. With incorporation of an approved on-site sanitary waste system, the project would be capable of adequately supporting the use of septic tanks and therefore considered to have a less than significant impact.

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

Construction and Operation

Less Than Significant with Mitigation Incorporated. There are no known paleontological resources within the project site. For this project, a paleontological resources records review was conducted using the online database maintained by the University of California Museum of Paleontology at Berkeley (UCMP 2023). A records search was also conducted by Dr. Lyndon Murray, district paleontologist for the Colorado Desert District Stout Research Center (SRC) at Anza-Borrego Desert State Park (ABDSP). In addition, a pedestrian field survey of the study area was conducted.

The UCMP database was queried for fossil site records within the potentially impacted formations. While geologic terms such as *lake deposits* and informal names such as *Lake Cahuilla beds do* not lend themselves to database searches, the results can be used as a general guide to the paleontological potential of the sediments in the vicinity of the project. In particular, the complex history of the geologic names complicated this search because historic locality records often retain their original stratigraphic designations despite later revisions to the nomenclature. Fortunately, the UCMP is aware of these issues, and many of the records indicate the history of the formation name (Jacobs 2023a, Jacobs 2023i)

Queries of the UCMP database did not yield any fossil records from the Borrego Formation, Brawley Formation, or *Quaternary lake deposits* or *Lake Cahuilla beds.* The UCMP database did however yield two invertebrate and two vertebrate fossil records from Pleistocene deposits in Imperial County, which may be correlative with the Lake Cahuilla beds or Brawley Formation. The two vertebrate localities are identified with the locality names *Seeley West* and *Coachella*, which are more than 20 miles from the project study area (Jacobs 2023a, Jacobs 2023i)

Several paleontological records searches of the Imperial Valley within the Salton Trough have been processed through SRC in the past two decades. Within the study area,

freshwater fossils are abundant in the Borrego and Brawley Formations and Lake Cahuilla beds. Several significant invertebrate, plant, and vertebrate fossil localities from within the Borrego Formation, Brawley Formation, and Lake Cahuilla beds are on file at the SRC. SRC yielded 45 invertebrate localities from within the Borrego Formation, one invertebrate and 34 vertebrate fossil localities from within the Brawley Formation, and 27 invertebrate and one vertebrate fossil localities from the Lake Cahuilla beds (Jacobs 2023a, Jacobs 2023i).

The Borrego Formation invertebrates indicate deposition in a large perennial lake and/or playa lake (Tarbet and Holman 1944, Dibblee 1954, Dronyk 1977, Wagoner 1977, Lutz et al. 2006). In addition to invertebrates, the Borrego Formation also has produced an assemblage of charophytes (algae), rare foraminifera, and fragments of petrified wood (Dibblee 1954, Kirby et al. 2007).

The Brawley Formation has yielded invertebrate ichnofossils; marine and terrestrial foraminifera and ostracodes; fossil leaves; marine, estuarine, and terrestrial mollusks; marine and terrestrial fishes; and small terrestrial vertebrate assemblages, including Mammuthus, Bison, Camelops, and Equus (Jefferson 2007, Kirby et al. 2007).

Fossils from the Lake Cahuilla beds were first reported by Blake in 1854 and 1857, who noted the occurrence of shells of various kinds of freshwater mollusks (clams and snails) (Blake, 1854; Blake 1857). Since then, numerous writers have discussed the occurrence of these molluscan fossils (Orcutt 1890, Stearns 1901, Whistler et al. 1995, Bowersox 2003). In addition, the occurrence of fossil fish remains has been reported by Hubbs and Miller (Hubbs and Miller 1948), Hubbs et al. (Hubbs et al. 1960), Myncklei (Myncklei 1979), and Whistler et al. (Whistler et al. 1995).

The freshwater molluscan assemblages reported by Whistler et al. (Whistler et al. 1995) documented at least four cycles of Lake Cahuilla inundation and desiccation. Whistler et al. also reported on vertebrate fossils recovered from Lake Cahuilla beds, including terrestrial reptiles (horned lizard, spiny lizard, brush lizard, shovel-nosed snake, night snake, gopher snake, ground snake, sidewinder, and rattlesnake) and mammals (cottontail rabbit, pocket mouse, kangaroo rat, ground squirrel, and wood rat) (Whistler et al. 1995). Freshwater fishes also were recovered and include desert pupfish, bonytail chub, and razorback sucker. Abundantly fossiliferous Lake Cahuilla bed strata also are exposed in the walls of an abandoned borrow pit southeast and east of the Salton Sea SRA maintenance yard and residency, south of Parkside Drive (Jefferson 2007).

In addition, paleontological mitigation work in Imperial County has resulted in the recovery of diverse fossil assemblages from temporary subsurface exposures of Lake Cahuilla bed sediments. During trenching and drilling for the Southern California Gas Line 6914 Loop Imperial Valley project between Brawley and Calipatria, well-preserved remains of freshwater mollusks (clams and mussels), ostracods, and fish were recovered from depths as shallow as five feet below the ground surface from Lake Cahuilla bed sediments. Mass grading operations for the State Route 78/111 Brawley Bypass project near Brawley exposed more than 35 feet of prehistoric Lake Cahuilla bed sediments from

which well-preserved remains of freshwater algae, mollusks, ostracods, and fish were recovered as shallow as three feet below the ground surface (SDNHM 2011).

Fossil remains from Lake Cahuilla bed sediments are considered significant and unique because of the paleoclimatic and paleoecological information they can provide (Jefferson 2006). In addition, Lake Cahuilla bed sediments may preserve evidence of human activity, both along the high lake margin and as the lake receded to the playa floor. The buried fluvial-deltaic and para-limnic deposits of older lacustrine phases could contain evidence of human interface with extinct late Pleistocene megafauna at the base of the Holocene strata (Jacobs 2023a, Jacobs 2023i).

During the field survey of the project study area, no significant fossil resources or localities were discovered.

Table 5.6-4 presents the paleontological potential of the geologic units that may be impacted during ground-disturbing activities for the project. Lake Cahuilla beds, Brawley Formation, and Borrego Formation possess a high paleontological potential to contain significant fossil remains. Holocene volcanic deposits are too young to contain paleontological resources and are formed at high temperatures, which would destroy any remains that may have been present; thus, they have no paleontological potential.

TABLE 5.6-4 PALEONTOLOGICAL POTENTIAL OF GEOLOGIC UNITS

Geologic Unit	Geologic Map Abbreviation	Type of Fossils	Paleontological Potential
Holocene Volcanic deposits	Qvr	None	None
Holocene to Pleistocene Lake Cahuilla beds	Ql	Invertebrates, Vertebrates, Plants, Microfossils	High
Pleistocene Brawley Formation	Not mapped at the surface within the study area, but present at unknown depth beneath unit Ql	Invertebrates, Vertebrates, Plants, Microfossils	High
Pliocene Borrego Formation	Not mapped at the surface within the study area, but present at unknown depth beneath unit Ql	Invertebrates, Microfossils, and Plants	High

Source: Jacobs 2023a

Construction activities involving ground disturbance that includes grading, trenching, drilling, and excavation operations would impact Lake Cahuilla bed sediments. Deeper excavation activities and drilling operations have the potential to not only penetrate Lake Cahuilla bed sediments, but also older and more deeply buried geologic deposits (Brawley Formation, Borrego Formation). Paleontological resources could be encountered during construction of the project.

Staff proposes Condition of Certification (COC) **PAL-1** through **PAL-8** to address the potential for the discovery of paleontological resources during excavation in native materials.

There is no potential to disturb paleontological resources during operations because there would be no earth-moving activities required for operations. Occasional minor surface disturbance may continue to be required during maintenance activities, but such disturbance would be temporary, small, and most likely limited to the disturbance of fill.

With the implementation of **PAL-1** through **PAL-8**, impacts to paleontological resources would be reduced to a less than significant level.

There are no unique geologic features mapped or identified within the site footprint. However, mud pots and mud volcanos are visible at the ground surface as well as in aerial photographs adjacent to the project site at Mullet Island, approximately 1.3 miles to the northwest and on the parcel directly east of the property. An imaginary line projected through these mud pots and mud volcanoes would cross the northeast corner of the property in a northwest-southeast orientation. Due to an overabundance of caution the power project and ancillary features would be positioned in the southern and southwestern portions of the 160-acre parcel. This would provide a buffer between the project and the potential future occurrence of mud pots (Jacobs 2023bb, TN 252491-1)

g. Would the project 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?

Construction and Operation

Less Than Significant Impact. Several issues influence the extraction of mineral resources in Imperial County, including the location of geologic deposition, the potential for impacts to the environment, commercial value, and land use conflicts. As a result, the extraction of mineral resources is limited to a relatively small number of sites throughout the County. In addition, at the project site, the geologic units at the surface and in the subsurface are widespread alluvial deposits that occur throughout the Imperial Valley. These geologic units are not unique in terms of commercial value. Thus, the potential for rare and unique recreational, commercial, or scientific deposits is very low.

The project would not result in a loss of availability of a known mineral resource that would be of value to the region and the residents of the state. Impacts related to mineral resources would be considered less than significant.

h. Would the project 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?

Construction and Operation

Less Than Significant Impact. The project site is not mapped or delineated on a local general plan, specific plan, or other land use plan as a locally important mineral resource recovery site. The geologic units at the ground surface and in the subsurface of the project area are widespread alluvial deposits that occur throughout the Imperial Valley; these units are not unique in terms of commercial value.

The potential for recreational or scientific deposits (for example, rare minerals) is also not unique to the project site, given the geologic environment in the area.

Therefore, the project would not result in the loss of availability of a locally important mineral resource and impacts to mineral resources would be considered less than significant.

5.6.2.3 Cumulative Impacts

A cumulative impact refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the project (PRC § 21083; CCR, Title 14, § 15064[h], 15065[c], 15130, and 15355).

Staff has identified the projects listed below as potential contributors to cumulative impacts on paleontological, geological, and mineral resources:

- Black Rock Geothermal Project (Proposed)
- Morton Bay Geothermal Project (Proposed)
- Elmore Geothermal Project (Existing)
- Cal Energy Generation (Existing)
- Vulcan Power Plant (Existing)
- Hudson Ranch Power Plant (Existing)

Cumulative impacts of the project on geologic hazards and resources of geothermal development from the extraction of geothermal fluids, in connection with current and other reasonably foreseeable geothermal projects, were considered. The project operations would include reinjection of geothermal fluids, which would be closely monitored at the project site. Additionally, the project would be required to comply with the seismic and subsidence monitoring requirements of the Imperial County General Plan, Geothermal Element. Therefore, the incremental effect of the project on geologic hazards and on the geothermal resource would be less than significant.

The project would not cause adverse impacts on geological resources and would not cause an exposure of people or property to geological hazards. Additionally, there are no minor impacts that could combine cumulatively with those of other projects. Thus, the project would not result in a cumulatively considerable impact.

No unique surface or near surface geologic and mineralogic resources have been identified in the project area. Development of this project is not expected to lead to a significantly cumulative effect on geologic and mineralogic resources within the project area.

There is a potential for fossils to be encountered in excavations at the site. If significant paleontological resources are uncovered during construction, they would be protected and preserved in accordance with Conditions of Certification **PAL-1** to **PAL-8**. These conditions would also mitigate any potential cumulative impacts.

The proposed project site would be situated in an active geologic environment. Strong ground shaking potential must be mitigated through foundation and structural design as required by CBC 2022, or the most current version succeeding that code. The potential for liquefaction would be addressed and mitigated through appropriate facility design. Soils that may be subject to settlement due to liquefaction, would be addressed and mitigated in accordance with a design-level geotechnical investigation as required by CBC 2022, or the most current successor to that code, and proposed **GEO-1.**

5.6.3 Project Conformance with Applicable LORS

Table 5.6-5 staff's determination of conformance with applicable local, state, and federal LORS, including any proposed Conditions of Certification, ensures the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific conditions of certification, the proposed project would be consistent with all applicable LORS. The subsection below, *Staff Proposed Conditions of Certification*, contains the full text of the referenced conditions of certification.

TABLE 5.6-5 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis for Determination**
Federal	
No federal regulations related to geologic or mineral resources apply to the project facility design.	
State	
Surface Mining and Reclamation Act of 1975	

TABLE 5.6-5 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis for Determination**
SMARA requires that all surface mines in the state be reclaimed both to minimize any adverse effects from the mining and to ensure that mined lands are returned to a usable condition and create no danger to public health and safety. The law requires local jurisdictions to enact ordinances to implement SMARA at the local level and to act as lead agency for issuance of permits, development of reclamation plans, and holder of reclamation financial assurances. Surface mining activities that would result in the disturbance of more than one acre of fill material or remove more than 1,000 cubic yards of material are subject to SMARA requirements.	**Yes.** Imperial County enacts ordinances to implement SMARA at the local level and acts as the lead agency for the issuance of permits, development of reclamation plans, and is the holder of reclamation financial assurances. BMPs will be implemented during construction to reduce the impact of runoff from the construction site. Monitoring will involve inspections to ensure that the BMPs are properly implemented and effective.
State Mining and Geology Board Reclamation Regulations	
These regulations further clarify and implement the provisions of SMARA by establishing standards for reclamation plans and financial assurances, as well as administrative procedures for lead agency oversight and decision appeals. SMARA is only applicable to the borrow pits.	**Yes.** SMARA, Chapter 9, Division 2 of the Public Resources Code, requires the State Mining and Geology Board to adopt state policy for the reclamation of mined lands and the conservation of mineral resources. The administering agency for this authority is the Imperial County Planning/Building Department. Imperial County enacts ordinances to implement SMARA at the local level and acts as the lead agency for the issuance of permits, development of reclamation plans, and is the holder of reclamation financial assurances.
Seismic Hazards Mapping Act	
Maps identify areas (zones) that are subject to the effects of strong ground shaking, such as liquefaction, landslides, tsunamis, and seiches. Requires a geotechnical report be prepared that defines and delineates any seismic hazard prior to approval of a project in a seismic hazard zone.	**GEO-1** requires the project owner to submit a Soils Engineering Report to the CBO for design review. This report must include a thorough discussion of seismicity and recommendations for ground improvement and/or foundation systems necessary to mitigate these potential geologic hazards, if present. Submittal and approval of this report would ensure compliance with this LORS.
California Building Code (2022)	

TABLE 5.6-5 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis for Determination**
The California Building Code (CBC, 2022) includes a series of standards that are used in project investigation, design, and construction (including seismicity, grading and erosion control). The CBC has adopted provisions in the International Building Code and has been amended by Shasta County.	**GEO-1** requires the project owner to submit a Soils Engineering Report to the CBO for design review. This report must include laboratory test data, associated geotechnical engineering analyses, and a thorough discussion of seismicity; liquefaction; dynamic compaction; compressible soils; and corrosive soils. In addition, the report must also include recommendations for ground improvement and/or foundation systems necessary to mitigate these potential geologic hazards, if present. Submittal and approval of this report would ensure compliance with this LORS.
Local	
Imperial County General Plan, Renewable Energy/Transmission Element, Goals 1, 2, and 7	
Goal 1: The County of Imperial supports the safe and orderly development of renewable energy while providing for the protection of environmental resources. **Goal 2:** The County will encourage development of electrical gen-tie lines along routes which minimize potential environmental effects. **Goal 7:** The County will actively minimize the potential for land subsidence to occur as a result of renewable energy operations.	**Yes.** The project incorporates engineered grading and drainage plans to minimize grading and assure appropriate drainage of the facility. Additionally, mitigation measures, including sediment and erosion control during grading and construction activities, would be implemented to minimize environmental impacts related to erosion and sediment transport. Geothermal production is compatible with agricultural uses, and for which the County has established mitigation measures to reduce potential agricultural impacts to less than a significant level. The project, as proposed, complies with the goals and objectives of this element.
Standards	
Society for Vertebrate Paleontology	
The "Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontological Resources: Standard Procedures" is a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources developed by the SVP, a national organization of professional scientists. The measures were adopted in October 1995, and revised in 2010 following adoption of the Paleontological Resources Preservation Act (PRPA) of 2009. The SVP impact mitigation guidelines establish criteria for identifying and assessing significant paleontological resources. Additionally, these guidelines include standards and procedures to be employed prior to site disturbance, monitoring during disturbance, and preservation/mitigation of identified resources.	**Yes.** **PAL-1** through **PAL-8** were developed based upon the guidance provided by the SVP and Bureau of Land Management (BLM) standards to ensure that, if present, paleontological resources would be properly identified and appropriate protection or salvage measures implemented to mitigate the loss of these resources due to construction. **PAL-1** through **PAL-8** require identification of a qualified Paleontological Resource Specialist, identification of qualified Paleontological Resource Monitors, training of site workers, periodic reporting, and collection, documentation and archival of any significant paleontological resources identified. Compliance with these eight conditions would ensure compliance with this LORS.

5.6.4 Conclusions and Recommendations

As discussed above, with implementation of COCs, the project would have a less than significant impact related to geologic, mineral, and paleontological resources and would conform with applicable LORS. Staff recommends adopting the COCs as detailed below.

5.6.5 Proposed Conditions of Certification

The following proposed COC/MMs include measures to both mitigate environmental impacts and ensure conformance with applicable LORS. The conditions below are enforceable as part of the CEC's certificate for the portions of the projects constituting the site and related facility. Additional impacts associated with project components outside of CECs jurisdiction, such as the well complex licensed by CalGEM, the temporary structures such as the laydown yard to be permitted by Imperial County, and the switchyard to be permitted by IID, require mitigation to be less than significant.

This CEQA analysis evaluates all impacts resulting from all aspects of the project, and for the entire project to have less than significant impacts, the mitigation actions described in these COC/MMs would need to be implemented by the various licensing jurisdictions as mitigation measures (MMs). For purposes of the facility certification issued by CEC, the following COC/MMs must be complied with by the applicant on the jurisdictional site and related facilities as delineated in the Project Description, Section 3.1. Verifications set forth below only apply to the COCs, not the MMs.

COC GEO-1/MM GEO-1 A Soils Engineering Report, as required by Section 1803 of the California Building Code (CBC 2022), or its successor in effect at the time construction of the project commences, shall specifically include laboratory test data, associated geotechnical engineering analyses, and a thorough discussion of seismicity; liquefaction; dynamic compaction; compressible soils; corrosive soils; and ground rupture due to faulting. In accordance with the CBC, the report must also include recommendations for ground improvement and foundation systems necessary to mitigate these potential geologic hazards, if present. In accordance with the California Business and Professions Code, the appropriate qualified California licensed individual(s) is required to sign and seal the soils engineering report.

Verification: The project owner shall provide the soils engineering report to the DCBO for review and approval, and shall provide to the compliance project manager (CPM) a copy of the soils engineering report, application for grading permit and any comments by the CBO at least 60 days prior to grading.

COC PAL-1/MM PAL-1 The project owner shall provide the CPM with the resume, qualifications, and contact information of its paleontological resource specialist (PRS) for review and approval. The PRS's resume shall include the names and phone numbers of references. The resume shall also demonstrate to the

satisfaction of the CPM the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by the CPM, the PRS shall meet the minimum qualifications for a Qualified Professional Paleontologist as defined in the Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources by the Society of Vertebrate Paleontology (SVP 2010). The experience of the PRS shall include the following:

1. Institutional affiliations, appropriate credentials, and college degree (M.S., Ph.D., or equivalent).
2. Ability to recognize and collect fossils in the field.
3. Local geological and biostratigraphic expertise.
4. Proficiency in identifying vertebrate and invertebrate fossils.
5. At least three years of paleontological resource mitigation and field experience in California and at least one year of experience leading paleontological resource mitigation and field activities.

The project owner shall ensure that the PRS obtains qualified paleontological resource monitors (PRMs) to monitor as the PRS deems necessary on the project. PRMs shall have the equivalent of the following qualifications:

BS or BA degree in geology or paleontology and a minimum of one year of relevant experience monitoring in California; or

AS or AA in geology, paleontology, or biology and a minimum of four years' relevant experience monitoring in California; or

Enrollment in upper division classes pursuing a bachelor's degree or more advanced degree in the field of geology or paleontology and a minimum of three years relevant monitoring experience in California.

If the approved PRS is replaced prior to completion of project mitigation and submittal of the paleontological resources report (PRR), the project owner shall obtain CPM approval of the replacement PRS. The project owner shall keep resumes on file for qualified PRMs. The PRM's resume shall include the names and contact information of references. If a PRM is replaced, the resume of the replacement PRM shall also be provided to the CPM for review and approval.

Verification: At least 60 days prior to the start of ground disturbance, a resume and statement of availability of its designated PRS for on-site work shall be supplied to the CPM, whose approval must be obtained prior to initiation of ground disturbing activities.

At least 30 days prior to ground disturbance, the PRS or project owner shall provide a letter with resumes naming anticipated PRM's for the project. The letter shall

state that the identified PRM's meet the minimum qualifications for paleontological resource monitoring as required by this condition of certification. If additional PRM's are needed during the project, the PRS shall provide additional letters and resumes to the CPM. The letter shall be provided to the CPM for approval no later than one week prior to the monitor's beginning on-site duties.

Prior to any change of the PRS, the project owner shall submit the resume of the proposed new PRS to the CPM for review and approval.

COC PAL-2/MM PAL-2 The project owner shall provide to the PRS and the CPM, for approval, maps and drawings showing the footprint of the power plant, construction lay-down areas, and all related facilities. Maps shall identify all areas of the project where ground disturbance is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS and CPM. The site grading plan and the plan and profile drawings for the utility lines would be acceptable for this purpose. The plan drawings must show the location, depth, and extent of all ground disturbances and be at a scale between 1 inch = 40 feet and 1 inch = 100 feet. If the footprint of the project or its linear facilities change, the project owner shall provide maps and drawings reflecting those changes to the PRS and CPM.

If construction of the project proceeds in phases, maps and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the PRS and CPM. Before work commences on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

At a minimum, the project owner shall ensure that the PRS or PRM consults weekly with the project superintendent and construction field manager to confirm area(s) to be worked the following week, until ground disturbance is completed.

Verification: At least 30 days prior to the start of ground disturbance, the maps and drawings shall be supplied to the PRS and CPM.

If there are planned changes to the footprint of the project, revised maps and drawings shall be provided to the PRS and CPM at least 15 days prior to the start of ground disturbance.

If there are changes to the scheduling of the construction phases, the project owner shall submit a letter to the CPM within five days of identifying the changes.

COC PAL-3/MM PAL-3 The project owner shall not commence ground disturbance until the PRS prepares a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) and submits the PRMMP to the CPM for review and approval. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting, sampling, and

reporting activities, and may be modified with CPM approval. The PRMMP shall be used as the basis of discussion when on-site decisions or changes are proposed. Copies of the PRMMP shall include all updates and reside with the PRS, each PRM, the project's on-site manager, and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the Society of Vertebrate Paleontology (SVP 2010) and shall include, but not be limited to, the following:

1. Procedures for and assurance that the performance and sequence of project-related tasks, such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking, construction monitoring, mapping and data recovery, fossil preparation and collection, identification and inventory, preparation of final reports, and transmittal of materials for curation shall be performed according to PRMMP procedures.
2. Identification of the person(s) expected to assist with each of the tasks required by the PRMMP and these conditions of certification.
3. A thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units.
4. An explanation of why sampling is needed, a description of the sampling methodology, and how much sampling is expected to take place in which geologic units. Include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained units.
5. A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed plan for monitoring and sampling at these locations.
6. A discussion of procedures to be followed: (a) in the event of a significant fossil discovery, (b) stopping construction, (c) resuming construction, and how notifications shall be performed.
7. A discussion of equipment and supplies necessary for collection of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits.
8. Procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum that meet the Society of Vertebrate Paleontology's standards and requirements for the curation of paleontological resources.
9. Identification of the institution that has agreed to receive data and fossil materials collected, requirements or specifications for materials delivered for curation and how they shall be met, and the name and phone number of the contact person at the institution.

10. A copy of the paleontological resources conditions of certification.
11. A copy of the daily monitoring log form.

Verification: At least 30 days prior to ground disturbance, the project owner shall provide a copy of the PRMMP to the CPM. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall include an affidavit of authorship by the PRS and acceptance of the PRMMP by the project owner evidenced by a signature.

COC PAL-4/MM PAL-4 Prior to ground disturbance the project owner and the PRS shall prepare a CPM-approved Worker Environmental Awareness Program (WEAP).

The WEAP shall address the possibility of encountering paleontological resources in the field, the sensitivity and importance of these resources, and legal obligations to preserve and protect those resources. The purpose of the WEAP is to train project workers to recognize paleontologic resources and identify procedures they must follow to ensure there are no impacts to sensitive paleontologic resources.

The WEAP shall include:

1. A discussion of applicable laws and penalties under the law.
2. Good quality photographs or physical examples of fossils expected to be found in units of high paleontologic sensitivity at, or near, the site.
3. Information that the PRS and PRM has the authority to stop or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource.
4. Instruction that employees are to stop or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM.
5. An informational brochure that identifies reporting procedures in the event of a discovery.
6. A WEAP certification of completion form signed by each worker indicating that they has received the training.
7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

The project owner shall submit the training script and, if the project owner is planning to use a video for training, a copy of the training video, with the set of reporting procedures for workers to follow that shall be used to present the WEAP and qualify workers to conduct ground disturbing activities that could impact paleontological resources.

Verification: At least 30 days prior to ground disturbance, the project owner shall submit to the CPM for review and comment the draft WEAP, including the brochure and

sticker. The submittal shall also include a draft training script and the set of reporting procedures for workers to follow.

At least 15 days prior to ground disturbance, the project owner shall submit to the CPM for approval the final WEAP and training script. If the project owner is planning to use a video for training, a copy of the training video shall be submitted following final approval of WEAP and training script.

COC PAL-5/MM PAL-5 No worker shall excavate or perform any ground disturbance activity prior to receiving CPM-approved WEAP training by the PRS, unless specifically approved by the CPM.

Prior to project ground disturbance the following workers shall be WEAP trained by the PRS in-person: project managers, construction supervisors, foremen, and all general workers involved with or who operate ground-disturbing equipment or tools. Following the start of ground disturbing activities and after the initial WEAP training conducted prior to ground disturbance, a CPM- approved video or in-person training may be used for new employees. If a video is used a qualified trainer shall be present to monitor training and respond to questions.

The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or other areas of interest or concern. A WEAP certification of completion form shall be used to document who has received the required training.

Verification: In the Monthly Compliance Report (MCR), the project owner shall supply copies of the WEAP certification of completion forms with the names of those trained, trainer identification, and type of training (in-person and/or video) offered that month. The MCR shall also include a running total of all persons who have completed the training to date.

The resume and qualifications of the trainer shall be submitted to the CPM for review and approval prior to providing WEAP training.

If the project owner requests an alternate paleontological WEAP trainer, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval prior to installation of an alternate trainer. Alternate trainers shall not conduct WEAP training prior to CPM authorization.

COC PAL-6/MM PAL-6 The project owner shall ensure that the PRS and PRM(s) monitor, consistent with the PRMMP, all construction-related grading and excavation in areas where potential fossil-bearing materials have been identified, both at the site and along any constructed linear facilities associated with the project. In the event that the PRS determines full-time monitoring is not necessary in locations that were identified as potentially fossil bearing in the PRMMP, the project owner shall notify and seek the concurrence of the CPM.

The project owner shall ensure that the PRS and PRM(s) have the authority to stop or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

Any change of monitoring from the accepted schedule in the PRMMP shall be proposed in a letter or email from the PRS and the project owner to the CPM prior to the change in monitoring and be included in the MCR. The letter or email shall include the justification for the change in monitoring and be submitted to the CPM for review and approval.

The project owner shall ensure that the PRM(s) keep a daily monitoring log of paleontological resource activities; copies of these logs shall be submitted with the MCR. The name and contact information of PRM(s) and PRS who were making field observations shall be included in the daily log. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.

The project owner shall ensure that the PRS notifies the CPM within 24 hours of the occurrence of any incidents of non-compliance with any paleontological resources Conditions of Certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the COC's.

For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM within 24 hours, or Monday morning in the case of a weekend event. In the event construction has been stopped because of a paleontological find, such notification shall be provided as soon as practical, but not later than 24-hours after a stop work order has been issued.

For excavations planned in material that is classified as having a moderate to high paleontological sensitivity prior to construction additional precautions may be required. Should excavation methods be proposed that would preclude effective monitoring and examination of paleontological resources encountered during excavation, appropriate mitigation involving education of the public about the lost resources shall be proposed in the PRMMP.

The project owner shall ensure that the PRS prepares a summary of monitoring and other paleontological activities to be included in each MCR. The summary shall include the name(s) of PRS or PRM(s) active during the month, general descriptions of training and monitored construction activities, and general locations of excavations, grading, and other activities. A section of the report shall include the geologic units or subunits encountered, descriptions of samplings within each unit, and a list of identified fossils.

Negative findings, when no fossils are identified, shall also be reported. A final section of the report shall address any issues or concerns about the project relating

to paleontologic monitoring, including any incidents of non-compliance or any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the report shall include an explanation in the summary as to why monitoring was not conducted.

Verification: A copy of the daily monitoring log of paleontological resource activities shall be included in the MCR.

The project owner shall ensure that the PRS submits the summary of monitoring and paleontological activities in the MCR. The project owner shall notify the CPM within 15 days in advance of any proposed changes in monitoring different from that identified in the PRMMP, which require concurrence between the PRS and CPM. If there is any unforeseen need to make a change in monitoring that prevents notification to the CPM 15 days prior to the change, the notice shall be given as soon as possible prior to implementation of the change.

COC PAL-7/MM PAL-7 The project owner shall ensure preparation of a paleontological resources report (PRR) by the designated PRS. The PRR shall be prepared following completion of ground-disturbing activities. The PRR shall include an analysis of the collected fossil materials and related information and shall be submitted to the CPM for approval.

The report shall include, but not be limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; and the PRS' description of sensitivity and significance of those resources; and indicate if and how fossil material was curated in accordance with COC **PAL-3**.

Any portions of this report that involve any independent judgment or analysis of the earth's crust, and the rocks and other materials which compose it, must be done by or under the responsible charge of a California licensed Professional Geologist.

Verification: Within 90 days after completion of ground-disturbing activities, including landscaping, the project owner shall supply the PRR under confidential cover to the CPM.

COC PAL-8/MM PAL-8 The project owner, through the designated PRS, shall ensure that all components of the PRMMP are adequately performed, including collection of fossil material, preparation of fossil material for analysis, analysis of fossils, identification and inventory of fossils, preparation of fossils for curation, and delivery for curation of all significant paleontological resource materials encountered and collected during project construction. The project owner shall pay all curation fees charged by the museum for fossil material collected and curated as a result of paleontological mitigation. The project owner shall also provide the curator with documentation showing the project owner irrevocably and

unconditionally donates, gives, and assigns permanent, absolute, and unconditional ownership of the fossil material.

Verification: Within 60 days after the submittal of the PRR, the project owner shall supply documentation to the CPM identifying the entity that would be responsible for curating collected specimens. This documentation shall also show that fees have been paid for curation and the owner relinquishes control and ownership of all fossil material.

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5.7 Hazards, Hazardous Materials/Waste, and Wildfire

Brett Fooks and Michele Shi

5.7.1 Environmental Setting

Existing Conditions

The Morton Bay Geothermal Project (MBGP or project) would be in a region of the Imperial Valley, east of the Salton Sea, characterized mostly by agriculture and geothermal power production. The area surrounding the project site is primarily agricultural land. The Power Generation Facility (PGF or project site) would be on approximately 51 acres of an approximately 160-acre parcel within Imperial County, California. The project site is west of the existing Hudson Ranch Power Plant and existing John L. Featherstone Power Station.

In addition to the PGF and linears (conveyance pipeline, the water pipeline, and the transmission line to the first point of interconnection), the project also consists of offsite components that fall outside the CEC's jurisdiction but are part of the overall geothermal project. These components include the geothermal well field under the jurisdiction of the county and the California Geologic Energy Management Division (CalGEM), the switching station under the jurisdiction of Imperial Irrigation District (IID), the temporary laydown/parking area, borrow pits, and construction worker camp under the jurisdiction of the county. These offsite components are considered as part of this analysis.

Hazardous Materials

Hazardous materials are defined by federal and state regulations that aim to protect public health and the environment. Hazardous materials have certain chemical, physical, or infectious properties that cause them to be considered hazardous. The term "hazardous materials" refers to both hazardous substances and hazardous wastes. Under federal and state laws, any material, including wastes, may be considered hazardous if it is specifically listed by statute as such or if it is toxic (causes adverse human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases). Hazardous materials are defined in the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 101(14), and also in the California Code of Regulations, Title 22, Chapter 11, Article 2, Section 66261, which provides the following definition:

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

The proposed project would involve limited transport, storage, use, and disposal of hazardous materials during construction, operation and maintenance, and decommissioning activities. Some examples of hazardous materials that may be used during construction, operation and maintenance, and decommissioning activities would include unleaded gasoline, diesel fuel, oil, lubricants (for example, motor oil, transmission fluid, and hydraulic fluid), solvents, adhesives, and paint materials. Operation and maintenance of the project would not require as many hazardous materials as construction or decommissioning. All hazardous materials would be transported, stored, handled, and used in accordance with applicable laws, ordinances, regulations and standards (LORS). A summary of hazardous materials that could be used for the proposed project during operation and maintenance is presented in **Table 5.7-1 Hazardous Materials**.

TABLE 5.7-1 HAZARDOUS MATERIALS

Hazardous Material[a]	Project Use	Maximum Quantity Onsite (gallons, pounds, cubic feet)
Chemical Treatment CL41	Oxidizing Biocide	1,000 gallons
ChemTreat CL456	Biodetergent	250 gallons
ChemTreat CL5428	Dispersant	250 gallons
ChemTreat CT775	Corrosion Inhibitor	250 gallons
ChemTreat CL2065	Nonoxidizing Biocide	500 gallons
HASA 12.5% Sodium Hypochlorite Solution	Oxidizing Biocide	3,000 gallons
ChemTreat C2187T	Oxidizing Biocide – Hydrogen Sulfide Abatement	2,000 pounds
ChemTreat C2184G	Oxidizing Biocide – Hydrogen Sulfide Abatement	500 pounds
NALCO GEO901	Naturally Occurring Radioactive Material Inhibitor	6,000 gallons
NALCO N7471 Antifoam	Antifoaming Agent	900 gallons
NALCO 1720	Oxygen Scavenger	500 gallons
GEO912	Scale Inhibitor	3,000 gallons
NALCO N9907	Polymer/Flocculant	4,000 pounds
Battery Electrolyte	Uninterruptible Power Supply and Emergency Shutdown Battery Array	1,200 gallons
Diesel No. 2	Fuel for Onsite Equipment	10,000 gallons
Diesel No. 2	Fire Pump Operation	1,000 gallons
Diesel No. 2	Emergency Generator Operation	25,352 gallons
Hydrochloric Acid <37%	Filter Press Wash	20,000 gallons
Hydrochloric Acid <2.5%	Filter Press Wash	800 gallons
Liquid Lime (42-47% Calcium Hydroxide)	Filter Press Wash	10,300 gallons
Sulfur Hexafluoride	Circuit Breakers/TET Test	300 pounds
Anti-Freeze and Coolant	Portable Equipment in Shop	2,000 gallons
Naphtha	Portable Equipment in Shop	500 gallons
Hydraulic Fluid	Portable Equipment in Shop/Equipment	4,000 gallons
Laboratory Reagents	Geothermal Fluids/Filter Cake Laboratory Analysis	10 gallons

TABLE 5.7-1 HAZARDOUS MATERIALS

Hazardous Material[a]	Project Use	Maximum Quantity Onsite (gallons, pounds, cubic feet)
Turbine Lubrication Oil	Lubricate Rotating Equipment (e.g., steam turbine bearings, valves)	22,000 gallons
Mineral Insulating Oil	Transformers	45,000 gallons
Acetylene	Welding Gas	750 cubic feet
Oxygen	Welding Gas	750 cubic feet
Propane	Torch Gas	750 cubic feet
Alloy Mix Gas	Welding Gas	750 cubic feet
Lab Gas (Helium, Argon, Nitrogen, Air)	Laboratory	750 cubic feet
Liquid Argon	Laboratory	300 gallons
Cleaning Chemicals	Cleaning	Varies (< 25 gallons of fluids or 100 pounds of solids for each chemical)
Paint	Touchup of Painted Surfaces	Varies (< 25 gallons of fluids or 100 pounds of solids for each chemical)

Source: Modified from Jacobs 2023kk – Table 5.5-1R. Use and Location of Hazardous Materials
Notes: a) Chemical vendor may be subject to change; however, chemical class will remain the same or similar.

Environmental Contamination

Existing and past land use activities are commonly used as indicators of sites or areas where hazardous material storage and use may have occurred or where potential environmental contamination may exist. For example, many historic and current industrial sites have soil or groundwater contaminated by hazardous substances. Other hazardous materials sources include leaking underground tanks in commercial and rural areas, contaminated surface runoff from polluted sites, and contaminated groundwater plumes.

The proposed project would be on approximately 51 acres of a 160-acre parcel within the unincorporated area of Imperial County, California and would be bounded by McDonald Road to the north, Davis Road to the east, Schrimpf Road to the south, and the Salton Sea to the immediate west. Each of these roads are unpaved. Existing land uses within the project boundaries are open space and recreational, including hunting activities. Land uses in the surrounding area consist of active agricultural operations; open space and recreational; as well as existing geothermal plants throughout the area, including the Hudson Ranch Power Plant and John L. Featherstone Power Station immediately east of the project site. The Red Hill Marina County Park is approximately one point five miles west of the project site. The Sonny Bono Wildlife Refuge Headquarters is approximately two point five southwest of the project site. The Alamo River is approximately one-half mile southwest and the New River is approximately five miles southwest of the project site (Jacobs 2023a).

The project owner hired Jacobs to conduct a Phase I Environmental Site Assessment (ESA) consisting of a site reconnaissance visit, interviews, and a review of readily available documents. The analysis provided by Jacobs within the Phase 1 ESA included a search

through Environmental Data Resources, Inc., a proprietary database related to generation, storage, handling, transportation, treatment of wastes, and the remediation of contaminated soil and groundwater sites. The Phase I ESA conducted in November 2022 identified that the project site has a history of agricultural land uses from approximately 1937 to 1953 and was undeveloped with raised berms to manage surface water ponding from 1976 to present. There are no existing structures on the project site. The Phase I ESA did not identify any recognized environmental conditions but identified de minimis conditions and other environmental conditions.

The reconnaissance visit conducted on September 21, 2022, identified several discarded quart-sized oil containers and these are considered de minimis conditions based on the potential for a small quantity of the oil to have been released from the containers. The Phase I ESA identified the potential for lead to be present in the soil due to several former hunting blinds and empty shotgun shells observed during the reconnaissance visit. Based on the historical agricultural land uses, the Phase I ESA also identified the potential for environmental contamination from past fertilizer, pesticide, or herbicide application (Jacobs 2023i).

Staff reviewed the State Water Resources Control Board (SWRCB) Geotracker database and the Department of Toxic Substances Control (DTSC) EnviroStor database to identify any known, open cases on hazardous material or environmental contamination sites within or adjacent to the project. The project does not have any known, open cases on the lists of hazardous materials sites (SWRCB 2024a; DTSC 2024a). Within two point five miles of the project site and adjacent to the offsite components, staff identified tiered permit sites associated with existing geothermal plants from the DTSC EnviroStor database. Potential contaminants of concern at the tiered permit sites are arsenic in affected soil. The DTSC provided oversight of remediation at the tiered permit sites and determined that the required corrective actions were considered complete on March 22, 2013. Ongoing oversight by the DTSC of the tiered permit sites includes annual inspections (DTSC 2024b).

Airports and Aviation Hazards

The nearest airport to the project site is the Imperial County Airport approximately 25 miles away, in Imperial California.

Schools

There are no schools within one-quarter mile of the proposed project. The project area is within the Calipatria United School District and the nearest schools are Calipatria High School, approximately six miles southeast, and Grace Smith Elementary School in Niland, approximately four miles northeast of the project site.

Emergency Evacuation Routes

Imperial County does not identify any designated evacuation routes near the project site. The decision to evacuate a given area is left to an Incident Commander, based on the

advice of a specialist familiar with different emergencies (fire, law enforcement, public health, etc.) (Imperial County 2016a).

Wildfire

CAL FIRE Hazard Severity Zones

The California Department of Forestry and Fire Protection (CAL FIRE) identifies and maps areas of significant fire hazards based on fire history, existing and potential fuel (natural vegetation), predicted flame length, blowing embers, terrain, typical fire weather for the area, and other relevant factors. The maps identify this information as a series of Fire Hazard Severity Zones (FHSZ), which are progressively ranked in severity as un-zoned, moderate, high, and very high. Fire Hazard Severity Zone maps evaluate "hazard," not "risk"; wildfire "hazard" is based on the physical conditions that create a likelihood and expected fire behavior over a 30 to 50-year period without considering mitigation measures such as home hardening, recent wildfire, or fuel reduction efforts (CAL FIRE 2024).

Wildland Fire Hazard Severity Zones in California are divided into State, local, or federal government responsibility areas. State Responsibility Areas (SRA) are locations where the financial responsibility of preventing and suppressing fires falls primarily on the State. Local Responsibility Areas (LRA) are locations where the financial responsibility for preventing and suppressing fires falls primarily on the identified county or city.

The project site is in the unincorporated area of Imperial County within a large contiguous LRA. The project is not in or near an SRA or in a very high FHSZ (CAL FIRE 2024).

CPUC High Fire Threat District Map

The California Public Utilities Commission (CPUC) has adopted over the last two decades a series of fire safety rules which includes the preparation of Fire-Threat and High Fire-Threat District (HFTD) Maps and the identification, evaluation, and adoption of more fire-safety regulations for the high fire threat districts. Areas mapped as high fire threat are required (under CPUC General Orders 95, 165, and 166) to have increased patrols along overhead lines, increased vegetation clearances and frequency of vegetation clearance, increased inspections of aerial communications facilities, and increased maintenance and repairs to correct fire hazards. The HFTD maps identify three tiers of fire threat/risk: Tier 1 zones near communities, roads, and utility lines, and are a direct threat to public safety; Tier 2 fire-threat areas outline areas where there is a higher risk (including likelihood and potential impacts on people and property) from utility related wildfires; and Tier 3 fire-threat areas outline areas where there is an extreme risk (including likelihood and potential impacts on people and property) from utility related wildfires.

The project site is also not on land classified as having a fire threat by the CPUC (CPUC 2024).

Regulatory

Laws, ordinances, regulations, and standards (LORS) related to hazardous materials/waste, aviation safety, hazards, and wildfire are summarized below. The purpose of the analysis is to ensure that the project conforms with applicable LORS. Details regarding federal, state and local LORS that apply to the project are included. Staff's analysis of project compliance with these LORS is presented in **Table 5.7-2 Conformance with Applicable LORS**.

Federal

Resource Conservation and Recovery Act. The Resource Conservation and Recovery Act (RCRA) (42 United States Code (U.S.C.) § 6901 et seq.) authorizes the United States Environmental Protection Agency (USEPA) to control hazardous waste from "cradle to grave" (generation, transportation, treatment, storage, and disposal). The USEPA approved California's RCRA program, referred to as the Hazardous Waste Control Law (Health and Safety Code §25100 et seq.) in 1992.

Toxic Substances Control Act. The Toxic Substances Control Act (TSCA) (15 U.S.C. § 2601 et seq.) authorizes the USEPA to require reporting, record-keeping, testing requirements, and restrictions related to chemical substances and/or mixtures. It also addresses production, importation, use, and disposal of specific chemicals, such as poly-chlorinated biphenyls (PCBs), asbestos-containing materials, lead-based paint, and petroleum.

Comprehensive Environmental Response, Compensation, and Liability Act. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. § 9601 et seq.), including the Superfund program, provides broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.

Clean Water Act. The Clean Water Act (CWA) is the principal federal statute protecting navigable waters and adjoining shorelines from pollution. The law was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. Since its enactment, the CWA has formed the foundation for regulations detailing specific requirements for pollution prevention and response measures. The USEPA implements provisions of the CWA through a variety of regulations, including the National Contingency Plan, as described above, and the Oil Pollution and Prevention Regulations. Implementation of the CWA is the responsibility of each state.

As part of the CWA, the USEPA oversees and enforces the Oil Pollution Prevention regulation (40, Code of Federal Regulations (CFR), Part 112), which is often referred to as the "SPCC rule" because the regulations describe the requirements for facilities to prepare, amend, and implement Spill Prevention, Control, and Countermeasure (SPCC) Plans. A facility is subject to SPCC regulations if a single oil (or gasoline, or diesel fuel) storage tank has a capacity greater than 660 gallons, or the total above ground oil storage capacity exceeds 1,320 gallons, or the underground oil storage capacity exceeds 42,000

gallons, and if, due to its location, the facility could reasonably be expected to discharge oil into or upon the "Navigable Waters" of the United States. The rule specifies that proactive, and not passive, measures be used to respond to oil discharges.

National Pollutant Discharge Elimination System. The National Pollutant Discharge Elimination System (NPDES) permit program, created in 1972 by the CWA, helps address water pollution by regulating point sources that discharge pollutants to waters of the United States. The permit provides two levels of control: technology-based limits and water quality-based limits (if technology-based limits are not sufficient to provide protection of the water body). Under the CWA, the USEPA may authorize state, tribal, and territorial governments to administer the NPDES permit program, enabling them to perform many of the permitting, administrative, and enforcement aspects of the NPDES program. In states authorized to implement CWA programs, the USEPA retains oversight responsibilities. Within the state of California, the SWRCB issues both general permits and individual permits under the NPDES permit program.

Hazardous Materials Transportation Act. The Department of Transportation (DOT), in conjunction with the USEPA, is responsible for enforcement and implementation of federal laws and regulations pertaining to safe storage and transportation of hazardous materials under the Hazardous Materials Transportation Act (HMTA) (49 U.S.C. § 5101 et seq.). DOT regulations implementing the Act (49 CFR parts 171-180), regulate the transportation of hazardous materials, types of material defined as hazardous, and the marking of vehicles transporting hazardous materials. This also include regulations relevant to the storage of explosives, as well as the packaging, labeling, materials compatibility, driver qualificators, and safety of transported explosives.

Federal Aviation Administration. The Federal Aviation Administration (FAA) Part 77—Safe, Efficient Use, And Preservation of The Navigable Airspace (14 CFR Part 77) establishes standards and notification requirements for objects that may impact navigable airspace. Airports and navigable airspace that are not administered by the Department of Defense (DOD) are under the jurisdiction of the FAA. This regulation includes: (a) FAA notification requirements for proposed construction, or the alteration of existing structures, that meet specific standards; (b) the standards used to determine obstructions to air navigation, and navigational and communication facilities; (c) the process for aeronautical studies of obstruction to air navigation or navigational facilities to determine the effect on the safe and efficient use of navigable airspace, air navigation facilities or equipment; and (d) the process to petition the FAA for discretionary review of determinations, revisions, and extensions of determinations. Additionally, FAA standards and Advisory Circular 70/7460-1L generally require any temporary or permanent structure, including appurtenances, that exceeds an overall height of 200 feet above ground level (AGL) to meet the requirements to be marked and/or lighted.

State

California Hazardous Waste Control Law. The California Hazardous Waste Control Law (HWCL) is administered by California Environmental Protection Agency (CalEPA) to

regulate hazardous wastes (Health and Safety Code §25100 et seq.). The HWCL lists 791 chemicals and about 300 common materials that may be hazardous; establishes criteria for identifying, packaging and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal and transportation; and identifies some wastes that cannot be disposed of in landfills.

California Department of Toxic Substance Control. The California Department of Toxic Substances Control (DTSC) is a department of CalEPA and is the primary agency in California that regulates hazardous waste, cleans-up existing contamination, and looks for ways to reduce the hazardous waste produced in California. DTSC regulates hazardous waste in California primarily under the authority of RCRA and the California Health and Safety Code. The hazardous waste regulations overseen by DTSC establish criteria for identifying, packaging, and labeling hazardous wastes; prescribe management of hazardous waste; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous waste that cannot be disposed of in landfills (22 California Code of Regulations (CCR) Sections 66250-69600.7).

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program. Regulations implementing a Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) address six elements: hazardous waste generators and hazardous waste onsite treatment; underground storage tanks; aboveground storage tanks; hazardous materials release response plans and inventories; risk management and prevention programs; and Unified Fire Code hazardous materials management plans and inventories (Health and Safety Code §25404 et seq.). The Unified Program requires CalEPA to certify local government agencies, known as Certified Unified Program Agencies (CUPAs) as able to implement all the required environmental programs and to consolidate, coordinate and make them consistent within their jurisdiction. State partner agencies involved in the implementation of the Unified Program and providing technical assistance to CUPAs include CalEPA, CAL FIRE, DTSC, and SWRCB. The Imperial County CUPA for the Project area is the DTSC.

Hazardous Materials Release Response Plans and Inventory Law. The California Hazardous Materials Release Response Plan and Inventory Law of 1985 (Business Plan Act, Health and Safety Code §25500 et seq.) requires businesses that store or use hazardous materials to prepare a Hazardous Materials Business Plan (HMBP) and submit it to the CUPA. An HMBP includes details of a facility and business conducted at the site, an inventory of hazardous materials that are handled and stored onsite, an emergency response plan, and a safety and emergency response training program for new employees with an annual refresher course.

The Aboveground Petroleum Storage Act Program. The aboveground program requires tank facilities storing greater than 1,320 gallons of petroleum that stores any amount of petroleum, to develop and implement the SPCC Plan requirements. A tank facility is any tank or tanks that are aboveground, including connected piping, that contain petroleum and are used by an owner or operator at a single location or site, is in secondary containment, and it is used to hold oil. The CUPA regulates businesses storing

petroleum in aboveground containers or tanks (Health and Safety Code § 25270-25270.13 et seq.).

Porter-Cologne Water Quality Act. The Porter-Cologne Water Quality Act is a state law that provides a comprehensive water quality management system for the protection of California waters. The act designated the SWRCB as the ultimate authority over state water rights and water quality policy, and also established nine Regional Water Quality Control Boards (RWQCBs) to oversee water quality on a day-to-day basis at the local and regional level.

California Department of Industrial Relations, Division of Occupational Safety and Health Administration. The California Occupational Safety and Health Administration (Cal/OSHA) is the primary agency responsible for worker safety. They oversee the handling and use of hazardous materials (8 CCR Sections 5139-5230) and, and the protection of workers exposed to wildfire smoke (8 CCR Section 5141.1). Cal/OSHA standards are generally more stringent than federal regulations. Under Sections 337-339, employers are required to monitor worker exposure to listed hazardous substances and notify workers of exposure. The regulations under Sections 337-339 specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings. Section 5141.1 requires identification or harmful exposures, a system for communicating wildfire smoke hazards, and training and instruction about wildfire smoke hazards.

California Highway Patrol. California Highway Patrol is the primary agency responsible for enforcing the regulations related to the transport of hazardous materials on California roads and highway (13 CCR 1160-1167).

Local

Imperial County CUPA, DTSC. CUPA agencies implement all the Unified Program elements and serve as a local contact for area businesses. On January 1, 2005, the DTSC was authorized by the CalEPA as the Imperial County CUPA (DTSC 2024c). As CUPA for Imperial County, the DTSC administers the following California programs:

- Hazardous Waste Generator and Tiered Permitting Program - Public health and environmental protection through regulation of facilities that generate, treat, and/or recycle hazardous waste.
- Hazardous Materials Business Plan - Public health and environmental protection through regulation and providing public access to information about facilities that store, handle, or use hazardous materials.
- California Accidental Release Prevention - Prevention of hazardous material release and public safety protection through permitting and inspection of facilities storing, handling, or are using extremely hazardous materials.
- Underground Storage Tanks - Public health and environmental protection through regulation of facilities that store hazardous materials in underground storage tanks.

- Aboveground Petroleum Storage Act - Public health and environmental protection through regulation of facilities that store hazardous materials in aboveground storage tanks.

Imperial County Hazardous Materials Area Plan. The plan identifies local, state, and federal responsibilities during incidents involving the release or threatened release of hazardous substances, including Pesticide Drift Incident Protocols, and provides information for governmental and other response agencies involved in a response to a hazardous materials incident occurring within Imperial County (Imperial County 2016b).

Imperial County Multi-Jurisdictional Hazard Mitigation Plan. The plan includes a risk assessment that identifies the natural hazards and risks that can impact a community based on historical experience, estimates the potential frequency and magnitude of disasters, and assesses potential losses to life and property. The plan also includes developed mitigation goals and objectives as part of a strategy for mitigating hazard-related losses (Imperial County 2021).

Imperial County Emergency Operations Plan. The plan establishes the foundational policies and procedures that define how the Imperial County will prepare for, respond to, recover from, and mitigate against natural or human-caused disasters. It provides a description of the emergency management organization and how it is activated (Imperial County 2016a).

Imperial County General Plan. The Imperial County General Plan consists of ten Elements entitled Land Use, Housing, Circulation and Scenic Highways, Noise, Seismic and Public Safety, Agricultural, Conservation and Open Space, Renewable Energy and Transmission, Water, and Parks & Recreation. Also included in the General Plan is a Land Use Map designating various land use categories which identify locations and describe the type and anticipated maximum allowable density of ultimate development.

The following goals and objectives are applicable to the proposed project from the Seismic and Public Safety Element, covering emergency preparedness and control of hazardous materials (Imperial County 1997).

- Goal 2: Minimize potential hazards to public health, safety, and welfare and prevent the loss of life and damage to health and property resulting from both natural and human-related phenomena.
    - Objective 2.1 Ensure the adequacy of existing emergency preparedness and evacuation plans to deal with identified hazards and potential emergencies.
    - Objective 2.2 Reduce risk and damage due to seismic hazards by appropriate regulation.
    - Objective 2.4 Support and assist in informing the public and other agencies of the hazards and risks of earthquakes and of techniques to employ to reduce those hazards.

  - Objective 2.5 Minimize injury, loss of life, and damage to property by implementing all state codes where applicable.
  - Objective 2.10 Reduce the risk of damage due to subsidence resulting from extraction of groundwater and geothermal resources by appropriate regulation.
- Goal 3: Protect the public from exposure to hazardous materials and wastes.
  - Objective 3.1 Discourage the transporting of hazardous materials/waste near or through residential areas and critical facilities.
  - Objective 3.2 Minimize the possibility of hazardous materials/waste spills.
  - Objective 3.3 Discourage incompatible development adjacent to sites and facilities for the production, storage, disposal, and transport of hazardous materials/waste as identified in the County General Plan and other regulations.
  - Objective 3.4 Adopt and implement ordinances, policies, and guidelines that assure the safety of County ground and surface waters from toxic or hazardous materials and wastes.

The following goals and objectives are applicable to the proposed project from the Renewable Energy and Transmission Element (Imperial County 2015).

- Goal 7: Actively minimize the potential for land subsidence to occur as a result of renewable energy operations.
  - Objective 7.10 Require operators of geothermal facilities to establish a notification system to warn or notify surrounding residents of the accidental release of potentially harmful emissions as part of an emergency response plan.

Imperial County Ordinance, Title 9, Division 17: Renewable Energy Resources. This county ordinance pertains to renewable energy resources and geothermal projects, requires a conditional use permit, and contains requirements for emergency response plans, and controls to minimize the possibility of fire, explosion, collision, or any unplanned release of hazardous materials, including a Hazardous Materials Management Plan (Imperial County 2017).

Colorado River Basin RWQCB NPDES Permit. The RWQCB makes water quality decisions for the Colorado River Basin Region (Region 7), which is in the southeastern corner of California. Region 7 covers Imperial County and parts of San Bernardino, Riverside, and San Diego counties. The RWQCB for the Project area is the Colorado River Basin RWQCB.

Airport Land Use Compatibility Plan. The Imperial County Airport Land Use Commission (ALUC) adopted the Airport Land Use Compatibility Plan (ALUCP) June 5, 1991. The ALUCP sets forth the criteria and policies which the ALUC will use in assessing the compatibility between the principal airports in Imperial County and proposed land use development in the areas surrounding them.

Cumulative

Section 15130 of the California Environmental Quality Act (CEQA) Guidelines (CCR, Title 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The CEQA Guidelines require that the discussion reflect the severity of the impacts and the likelihood of their occurrence but need not provide as much detail as the discussion of the impacts attributable to the project alone.

Pursuant to CEQA, a cumulative impacts analysis can be performed by either 1) summarizing growth projections in an adopted general plan or in a prior certified environmental document, or 2) compiling a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this Staff Assessment.

A master list of cumulative projects within the study area is provided in the **Section 1 Executive Summary**, **Table 1-2**.

The geographic extent for the analysis of cumulative impacts related to hazards, hazardous materials, and hazardous waste is limited to the immediate vicinity surrounding the project as the project hazards, hazardous materials, and hazardous waste impacts are limited to the project site and immediately adjacent areas. Similar impacts of other past, present, and reasonably foreseeable future projects that would have the potential to occur would also be limited to their respective project sites and immediately adjacent properties. Therefore, a review of the cumulative projects list did not identify any projects with potential cumulative effects relative to hazards, hazardous materials, and hazardous waste.

The area for cumulative impacts related to wildfire is related to areas that are in or near an SRA or lands classified as a very high FHSZ, or on land classified by the CPUC as having a fire threat. A review of the cumulative projects did not identify any projects that met the above criteria. Therefore, no projects have the potential for cumulative effects related to wildfire.

5.7.2 Environmental Impacts

HAZARDS, HAZARDOUS MATERIALS, AND WILDFIRE	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐

HAZARDS, HAZARDOUS MATERIALS, AND WILDFIRE	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b. Would the project 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. Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d. Would the project 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. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g. Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒
h. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
i. Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
ii. 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?	☐	☐	☐	☒

HAZARDS, HAZARDOUS MATERIALS, AND WILDFIRE	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
iii. 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?	☐	☐	☐	☒
iv. 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?	☐	☐	☐	☒

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, hazards and hazardous materials and wildfire.

5.7.2.1 Methodology and Thresholds of Significance

In addition to the above environmental checklist, staff used the following methodology and thresholds of significance to evaluate the project.

Methodology

Hazards, Hazardous Materials, and Hazardous Waste

The hazardous materials analyzed include those potentially existing on the site and those that would be used as part of project construction, operations and maintenance, and decommissioning. Potential existing hazards were assessed based on review of information online and in state hazard databases and maps for the project area.

Some hazardous materials would be used on a short-term basis during construction and decommissioning. Others would be stored onsite for use during operations and maintenance. Therefore, this analysis examines the choice and amount of chemicals to be used, how the project would use the chemicals, how they would be transported to the facility, and how the project plans to store the materials onsite.

The project is required to provide documentation of the nature of any existing or future releases of hazardous materials that would become hazardous waste from construction or operation. Potential or existing releases or contamination would be influenced by site specific factors including, but not limited to, the concentration of the contaminant in

question, the proposed use of the contaminated area, and any potential pathways for worker and general public exposure.

Wildfire

Data on local fuel conditions, weather conditions, and historic ignition sources are used to help determine the potential for damaging impacts to occur as a result of a project-caused wildfire. Wildfire-related environmental data including weather, fuels, topography, fire history, and wildfire history were derived from publicly available regional weather data to evaluate the potential for adverse direct and indirect impacts to occur as a result of project construction, operation, and maintenance.

Thresholds of Significance

A threshold of significance is the line at which a project's environmental impact becomes severe enough that mitigation is required to reduce that impact below the significance line. Impact categories based on the CEQA Environmental Checklist, Appendix G, of the CEQA Guidelines are considered to evaluate if the relevant project impacts are to a degree requiring mitigation.

5.7.2.2 Direct and Indirect Impacts

a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Construction

Less Than Significant with Mitigation Incorporated. During construction of the project, common hazardous substances typical of construction projects would be transported to, used, and stored at the project site and offsite components. It is appropriate to rely upon the extensive regulatory framework that applies to the shipment of hazardous materials on California highways and roads to ensure safe handling in general transportation. Hazardous materials such as gasoline and diesel fuel, oils and lubricants, hydraulic fluid, solvents, adhesives, batteries, and paints and coatings would be used in construction activities, construction equipment, and vehicles. Hazardous materials would be stored in designated construction staging areas in compliance with LORS, when not in use. Any impacts resulting from spills or other accidental releases of these materials related to work on the PGF and related linears, as well as work occurring at the borrow pits, switching station, construction laydown areas, wells and well pads and their associated piping would easily be cleaned up due to the small quantities involved and their infrequent use. Temporary containment berms would also be available to be deployed when necessary to help contain any spills during the construction of the project. Additionally, staff proposed **WORKER SAFETY-1** would require the project owner to develop construction worker safety programs and procedures to protect workers from exposure to hazardous materials and waste for the PGF and related linears. These developed safety

programs and procedures would also be required by LORS for the borrow pits, switching station, construction laydown areas, wells and well pads and their associated piping.

Small quantities of hazardous waste would be generated during construction and could include waste paint, spent construction solvents, waste cleaners, waste oil, oily rags, waste batteries, excavation dewatering water, flushing and cleaning fluids and spent welding materials. During construction, contractors would be required to collect and place any generated hazardous waste into waste disposal and collection receptacles for the proper disposal of hazardous waste. They would be placed throughout the PGF and linears, the borrow pits, switching station, construction laydown areas, wells and well pads and their associated piping. The waste would be delivered to an authorized hazardous waste management facility before the expiration of the 90-day storage limit for the project. Hazardous waste storage, handling, and disposal would comply with applicable LORS.

Operation

Less Than Significant with Mitigation Incorporated. Project operation and maintenance activities would transport, use, and store a variety of hazardous materials, including diesel fuel, lubricating oils, mineral oil, and hydrochloric acid. **Table 5.7-1** presents the hazardous materials that would likely be used and stored on the project and switching station and their anticipated uses. The project site and the switching station would prepare a HMBP prior to operation based on the hazardous materials for each respective location. The wells and well pads would not require an HMBP because any hazardous materials required for the maintenance of the wells would be at the project site. The preparation of the HMBP would list the hazardous materials and their location which ensures that first responders are prepared to respond to any incidents that could occur at the project site or the switching station. With the large quantities of turbine and mineral oil at the project site and mineral oil at the switching station, a SPCC would be required for both the project site and the switching station. The SPCC would lay out the proper procedures to help prevent a discharge of petroleum products, as well as control a discharge should one occur at the project site or the switching station. Therefore, staff proposes **HAZ-1** which would require the submission of the HMBP and SPCC for the project site to the DTSC, the Imperial County CUPA for the project area, for review and comment and to the Compliance Project Manager (CPM) for review and approval. Staff also proposes that IID adopt **HAZ-1** to ensure that any impacts from the storage and use of mineral oil at the switching station would be less than significant.

There is the potential for the project to increase the quantities or change the types of hazardous materials that are used at the project site. New or increased amounts of hazardous materials could require new LORS requirements for the project site. Therefore, staff proposes **HAZ-2** which would require the project owner to notify and seek approval from the CPM before changing the quantity of or using a new hazardous material onsite. This would ensure that any new or the change in the amount of a hazardous material introduced to the project site would comply with applicable LORS. Given the infrequent change out of mineral oil and proper testing of any transformers at the switching station,

the mineral oil should last for a long time. Therefore, it is not necessary for IID to impose **HAZ-2** on the switching station.

Several bulk chemicals would be delivered to the project site during operation. Staff considers an accidental release during the transfer from a delivery truck to a storage tank on the project site to be the most probable accident scenario. Therefore, staff proposes **HAZ-3** requiring the development of a safety management plan for the delivery of bulk chemicals and the submission of the plan to the CPM for review and approval. The safety management plan would include the required personal protective equipment for each bulk chemical, a comprehensive loading and unloading checklist, and requirements to ensure the proper bulk chemical is being unloaded which would help reduce the likelihood of an accidental release to the environment or the mixing of incompatible materials that could result in toxic vapors. Given the reasons stated in the paragraph above for the mineral oil at the switching station, staff does not believe mitigation during delivery is needed for the switching station.

The project site would be classified as a hazardous waste generator. Hazardous waste generated could include used lubricating oils, brine pond solids, geothermal scale, cooling tower debris and sludge, aerosol containers, solvents, paint, adhesives, and lead acid batteries. Additionally, the filter cake could be characterized at times as hazardous due to elevated concentrations of heavy metals (Jacobs 2023a, p. 5.14-4). Any hazardous waste generated from maintenance activities on the wells and well pads and their associated piping would be transported back to the project site for proper storage and disposal. Such wastes would be stored onsite for less than 90 days and transported away by licensed hazardous waste hauler companies. Wastes would be transported only to permitted waste management facilities and would comply with regulations that apply to the shipment of hazardous materials on California roads and highways to ensure safe handling in general transportation. The facility operator would have to obtain a site-specific USEPA hazardous waste generator identification number that would be used to manifest hazardous waste before offsite disposal, treatment or recycling from the project could begin. Staff proposes **HAZ-4** to ensure that the project has obtained the project's USEPA identification number before the start of construction, reports the number to the CPM, and notifies the CPM of new or revised numbers. The switching station would be normally unmanned and would not generate any hazardous waste. During any infrequent maintenance activities, the site would store, collect and remove the hazardous waste. The switching station project owner would be required to acquire a temporary USEPA identification number, which is good for 90 days, to ensure that any hazardous waste generated during maintenance activities could be removed. For this reason, **HAZ-4** is not required for the switching station. CEC staff reviewed the procedures that would be developed to ensure proper labeling, storage, and disposal of hazardous waste and concluded that implementation would be adequate to ensure that hazardous waste would be disposed of in accordance with applicable LORS for the project site and the switching station (Jacobs 2023a, p. 5.14-11). Additionally, staff proposed **WORKER SAFETY-2** includes operations and maintenance worker safety programs and procedures to protect workers from exposure to hazardous materials and waste.

The project owner has stated that a security plan would be prepared and implemented for the project. The proposed security plan would include a description of security measures and procedures for evacuating, notifying authorities of a security breach, monitoring fire alarms, conducting site personnel and hazardous materials drivers background checks, and site access (Jacobs 2023a, pp. 5.5-15 – 5.5-16). Perimeter security measures utilized for this project could include security guards, breach detectors, motion detectors, and video or camera systems. Staff concurs that the above referenced security elements are needed to ensure the protection of California's electrical infrastructure from vandalism or domestic/foreign attacks. Therefore, staff proposes **HAZ-5** and **HAZ-6** which would require the project owner to create a construction and operations security plan to ensure a minimum level of security for the project. Given that the production and injection wells are an essential component of the PGF, staff proposes the Imperial County and CalGEM adopt **HAZ-5** and **HAZ-6** to ensure that the steam production wells are secure for power generation. Additionally, staff proposes that IID adopt **HAZ-5** and **HAZ-6** to ensure that the switching station is kept secure to ensure the reliability of the electric grid.

b. Would the project 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?

Construction

Less Than Significant with Mitigation Incorporated. As discussed above in criterion "a", project construction activities would involve the transportation, use and storage of hazardous materials at the project site and offsite components. Several hazardous materials would be used in construction activities. Potentially, the improper use and storage of hazardous materials could lead to leaks and spills. However, most spills and leaks would be limited and easily cleaned up with spill kits due to the small quantities involved. In addition, hazardous materials would use temporary secondary containment to lower the risk of a release to the environment. Staff reviewed the details of the project's best management practices that would be developed to reduce the potential for incidents involving hazardous materials and concluded that implementation would be adequate to ensure that hazardous materials handling would comply with applicable LORS (Jacobs 2023a, pp. 5.5-13 – 5.5-14). Therefore, hazardous materials would be stored, used, and cleaned up in compliance with LORS. Additionally, staff proposed **WORKER SAFETY-1** would include construction worker safety programs and procedures to protect workers from exposure to hazardous materials and waste. These developed safety programs and procedures would also be required by LORS for the borrow pits, switching station, construction laydown areas, wells and well pads and their associated piping.

Hydrogen Sulfide Emissions

During the construction of the geothermal wells, there is the possibility of worker exposure to hydrogen sulfide (H_2S). Staff proposes that Imperial County and CalGEM

adopt a mitigation measure similar to the Drilling and Construction of Wells Safety program contained in **WORKER SAFETY-1** which would require construction workers to wear the proper personal protective equipment. Additionally, this program would ensure that the construction workers would know how to deal with the dangers of H_2S. For more information refer to **Section 4.4 – Worker Safety and Fire Protection.**

Operation

Less Than Significant with Mitigation Incorporated. Project operation and maintenance activities would transport, use, and store a variety of hazardous materials as shown in **Table 5.7-1**. Improper use and storage of these materials could lead to leaks and spills potentially resulting in worker exposure or environmental contamination. Staff's proposed **HAZ-1** would ensure the preparation of a project specific operations HMBP and SPPC plans for the PGF and the switching station. The operations HMBP would ensure that the types, quantities, and locations of hazardous materials are known to project staff and first responders for the PGF and the switching station. The operations SPCC would address procedures to prevent releases of oil, clean them up should they occur, and release reporting requirements for the PGF and the switching station. Stored hazardous materials onsite would also have secondary containment to help ensure that spills would be contained onsite. There would also be a be spill kits to help clean up any hazardous materials spills for both sites. For the bulk hazardous materials onsite, staff proposed **HAZ-3** would ensure that the appropriate safety management programs would be in place to prevent any accidental releases on the PGF site. However, as discussed above in criterion "a", the switching station would not require **HAZ-3**. Staff reviewed the details of the project's hazardous materials management practices and concluded that their implementation would be adequate to reasonably mitigate against accidental releases of hazardous materials (Jacobs 2023a, pp. 5.5-14 – 5.5-15). Additionally, staff proposed **WORKER SAFETY-2** would include operations and maintenance worker safety programs and procedures to protect workers from exposure to hazardous materials and waste. Staff proposes that IID adopt **HAZ-1** to ensure that any impacts from the storage and use of mineral oil at the switching station would be less than significant.

Hydrogen Sulfide Emissions

Hydrogen sulfide (H_2S) emissions occur naturally from geothermal fields and as episodic events of H_2S exceedances in the ambient air near the Salton Sea. The proposed project would result in H_2S emissions during commissioning, and operation and maintenance activities. Emission sources would primarily be from the H_2S abatement equipment during routine operations at the cooling tower, including at the biological oxidation box for the condensate bio-oxidation abatement systems and the submerged water distribution sparger pipes for the non-condensable gas sparger abatement system. Emissions from the production testing unit (PTU), mobile test unit (MTU), and rock muffler (RM) would be limited, infrequent, and not occur concurrently during routine operations.

Staff's Air Quality Impact Analysis (AQIA) covering the maximum modeled 1-hour H_2S impacts from project routine operations, PTU, RM, and MTU operations showed exceedances by PTU, RM, and MTU operations if they would occur during worst-case

meteorological conditions. However, such exceedances would be characterized as a nuisance based on its odor detection level and not based on adverse health effects, would represent a low-likelihood situation, and would decrease rapidly in probability with distance from the fence line for PTU and RM operations or from the MTU well pad locations. In addition, staff's AQIA showed maximum modeled 1-hour H_2S impacts at residential receptors would not exceed the 1-hour H_2S standard level and routine operations showed no exceedances of the 1-hour H_2S standard level at both the fence line and at residential receptors. Therefore, the project would not create a significant hazard to the public or the environment relating to H_2S emissions during routine operations. For more information refer to **Section 5.1 – Air Quality**.

c. Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Construction and Operation

No Impact. There are no schools located or proposed within one-quarter mile of the proposed project. In addition, no acutely hazardous materials would be used during project construction and operation activities. As described above in criterion "b" the proposed project routine operations would not produce H_2S emissions above the 1-hour H_2S standard level. Therefore, there is no significant impact.

d. Would the project 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?

Construction

Less Than Significant with Mitigation Incorporated. The project site and the offsite components are not on any listed hazardous materials sites. Within two point five miles of the project site and adjacent to the offsite components, staff identified tiered permit sites associated with existing geothermal plants from the DTSC EnviroStor database. At the tiered permit sites, cleanup activities and necessary remediation were completed in 2013 with DTSC oversight and the DTSC continues oversight with annual inspections (DTSC 2024b). Therefore, the potential for contaminated soil or groundwater from these cleanup sites to spread to the project site and offsite components is low. In addition, the DTSC continues to provide oversight to the cleanup sites to ensure any future potential remediation complies with LORS. Therefore, there is no potential impact to the public or environment from known existing hazardous materials sites.

Unknown Environmental Contamination

The project owner hired Jacobs to conduct a Phase I ESA in November 2022. The Phase I ESA is conducted to identify any conditions suggestive of releases and threatened releases of hazardous substances at the project site and to identify any location known

to be contaminated (or to be a source of contamination) near the project site. Such a location is known as a Recognized Environmental Condition (REC). The Phase I ESA does not involve any physical sampling or testing of groundwater and/or soil. Staff reviewed the Phase I ESA to determine if additional site characterization work would be needed and if any mitigation would be necessary to protect the environment, construction workers, or the public.

The Jacobs Phase I ESA did not identify onsite hazards or contaminants that would warrant additional environmental remediation. The Phase I ESA did not identify any RECs. However, the Phase I ESA identified potential impacts to soil and groundwater within the project site due to its historical agricultural land uses and hunting activities (Jacobs 2023i).

There are no existing structures on the project site and existing land uses within the project site are open space and recreational. Construction activities for the project would include ground disturbing activities for clearing, grading, excavation, and foundation installation related to work on the PGF and related linears, as well as work occurring at the borrow pits, switching station, construction laydown areas, wells and well pads and their associated piping. Pipeline construction would consist of various activities, including, but not limited to, clearing and grubbing, excavation for pipeline supports, pipe handling and welding (Jacobs 2023a). Ground disturbing activities would have the potential to encounter impacted groundwater and/or soil. Therefore, staff proposes **HAZ-7** which would require the submission of a Site Management Plan (SMP) to the DTSC, the Imperial County CUPA for the Project area, for review and comment and to the CPM for review and approval prior to the start of any ground disturbing activities. The SMP shall be prepared by a California Registered Professional Engineer or Professional Geologist with sufficient experience in hazardous waste management. The SMP would be used for proper identification, handling, onsite management, and disposal of the impacted soil and groundwater. The specific objective of the SMP would be to describe the procedure to be followed during ground disturbances to ensure worker protection from toxicant exposure. The scope of the SMP would be limited to activities involving excavation, contaminant characterization, and reuse and/or disposal of contaminated soil and groundwater. The SMP would include engineering controls, Health and Safety Plans, earthwork schedules, and a list of responsible staff.

To date, there are no LORS requirements for site characterization of potentially contaminated sites. A professional engineer or professional geologist with sufficient experience in hazardous waste management would have the requisite expertise to determine whether additional investigations are needed to identify the extent of possible contamination and to ensure proper handling and disposal contaminated soil and groundwater. Therefore, staff proposes **HAZ-8** which would require that an experienced and qualified professional engineer or professional geologist would be available for consultation if contamination is discovered during ground disturbing activities. The resume of the professional engineer or professional geologist shall reflect experience in remedial investigations and feasibility studies. Staff proposes **HAZ-9** requiring the

professional engineer or geologist to inspect the site, determine what would be required to characterize the nature and extent of contamination, and provide a report to representatives of the DTSC and the CPM on findings and the recommended course of action. Related activities would specifically include soil removal, dust suppression, and worker exposure prevention by means of wearing personal protective equipment. Any contaminated soils and/or groundwater identified would be removed and disposed of according to the appropriate local, state, and federal regulations under the oversight of the agency taking lead jurisdiction. Staff proposes that Imperial County and CalGEM adopt **HAZ-7, HAZ-8,** and **HAZ-9** as mitigation measures for the wells and well pads and their associated piping to ensure that any impacts from unknown environmental contamination would be less than significant. Staff also proposes that Imperial County adopt **HAZ-7, HAZ-8,** and **HAZ-9** as mitigation measures for the borrow pits and construction laydown areas to ensure that any impacts from unknown environmental contamination would be less than significant. Staff also proposes IID adopt **HAZ-7, HAZ-8,** and **HAZ-9** as mitigation measures at the switching station for the same reasons stated above.

Operation

No Impact. Operation and maintenance activities would not involve excavation activities and would therefore have no impact.

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?

Construction and Operation

No Impact. There are no public or private airports within two miles of the project and the project does not fall within an airport land use plan. Therefore, the project would not pose a safety hazard and would have no impact. Project construction and operation would not result in excessive noise impacts for people residing or working in the project area, as described in a more detailed analysis in **Section 5.9 – Noise and Vibration**.

f. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Construction and Operation

No Impact. There are no specifically designated evacuation routes described in the Imperial County Multi-Jurisdictional Hazard Mitigation Plan or Imperial County Emergency Operations Plan. The project would not require closures of public roads for project construction or operation. Emergency vehicles would also maintain their right of way during project construction and operation activities. For more information refer to **Section 5.14 – Transportation.**

g. Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

Construction and Operation

No Impact. The project site is not in or near an SRA or lands classified as a very high FHSZ, and not on land classified by the CPUC as having a fire threat. Therefore, the project would not expose people or structures to a significant risk of loss, injury or death from wildland fires. Further discussion of impacts of wildland fires is included below under criterion h) (i) through (iv).

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

i. Substantially impair an adopted emergency response plan or emergency evacuation plan?

Construction

No Impact. As discussed in the "Environmental Setting" subsection, the project is not in or near an SRA or lands classified as a very high fire hazard severity zone, and not on land classified by the CPUC as having a fire threat. Therefore, the project would have no impact on an adopted emergency response plan or evacuation plan.

The project's traffic levels during construction would experience a minimal increase that would not degrade traffic performance significantly. Emergency response access during construction would not be significantly impeded. The project would not involve the development of structures that could potentially impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. No streets would be closed, rerouted, or substantially altered during construction.

Operation

No Impact. The project does not involve the addition of many people to the local area as discussed in **Section 5.11 – Socioeconomics** and thereby would not increase emergency response demand during a potential evacuation. Thus, the project would not interfere with the coordination of the county's emergency operations plan at the emergency operations center or alternate emergency operations center. Nor would the project interfere with any statewide emergency response, or evacuation routes or plans. Adequate emergency access to the project site and surrounding area would be maintained.

ii. 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?

Construction and Operation

No Impact. The topography of the project site is flat and the land use surrounding the project is predominately agricultural with some geothermal well pads, pipelines and power plants dispersed among the agricultural uses. Therefore, the project would have no impact associated with exposing project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of wildfire.

Additionally, the project is not in or near an SRA or lands classified as a very high FHSZ, and not on land classified by the CPUC as having a fire threat.

iii. 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?

Construction

No Impact. The project would construct several offsite linear features. The project would connect to nearby well pads used in the production of brine and disposal of spent brine. Also, to serve the project, the project would construct a three point two mile gen-tie line to the first point of interconnection with the IID balancing authority. The construction of these utilities would not block access to any road or result in traffic congestion. Therefore, the constructed electrical supply line and other project infrastructure would not constitute a possible ignition source for local vegetation, nor would it block access to any road or result in traffic congestion.

Additionally, the project is not in or near an SRA or lands classified as a very high FHSZ, and not on land classified by the CPUC as having a fire threat.

Operation

No Impact. The project would not require the installation of associated infrastructure that could exacerbate fire risk or result in impacts to the environment. Also, the project would include fire water storage and the standard fire management equipment and meet the requirements of applicable building and fire codes. The substation and switching station would be constructed in compliance with IID standard and good utilities engineering practices and thus would limit these as a possible ignition source. Maintenance of the project and proposed utilities would not physically block any access roads or result in traffic congestion that could significantly compromise timely access to this facility or any other location.

Additionally, the project is not in or near an SRA or lands classified as a very high FHSZ, and not on land classified by the CPUC as having a fire threat.

iv. 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?

Construction

No Impact. The project would not substantially alter local drainage patterns. Storm water discharge during construction would be managed according to the project's Storm Water Pollution Prevention Plan, and appropriately discharged to a retention basin. The project would therefore not be expected to contribute to a flooding hazard onsite or offsite. For further discussion of the potential flooding impacts that could result from the proposed project, see **Section – 5.16 Water Resources.**

Additionally, the project is not in or near an SRA or a very high FHSZ, or land classified as having a fire threat by the CPUC that could be altered post-fire.

Operation

No Impact. Operation of the project would not alter the course of a drainage (stream or river) and would not substantially alter local drainage patterns. As discussed in this section, the topography of the project site and surrounding area is relatively flat and minimally developed. Therefore, the project would not be exposed to post-fire slope instability or drainage changes.

Additionally, the project is not in or near an SRA or a very high FHSZ, or land classified as having a fire threat by the CPUC.

5.7.2.3 Cumulative Impacts

Less Than Significant Impact. The cumulative effect of hazards such as hydrogen sulfide, the transportation, use, and storage of hazardous materials and the generation and haul away of hazardous waste would be limited to the project site and immediately adjacent areas. No cumulative projects were identified at or immediately adjacent to the project, therefore there are no projects with the potential to combine cumulatively with the project relative to hazards, hazardous materials and hazardous waste.

The cumulative effect of wildfire would be limited because the project site is not in or near an SRA or lands classified as a very high FHSZ, and not on land classified by the CPUC as having a fire threat. Additionally, no cumulative projects were identified at or immediately adjacent to the project within or near an SRA or lands classified as a very high FHSZ, or on land classified by the CPUC as having a fire threat. Therefore, there are no projects with the potential to combine cumulatively with the project relative to wildfire.

5.7.3 Project Conformance with Applicable LORS

Table 5.7-2 details staff's determination of conformance with applicable local, state and federal LORS, including any proposed COC, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific COCs, the proposed project would be consistent with all applicable LORS. The subsection below, "Staff Proposed Conditions of Certification," contains the full text of the referenced COCs.

TABLE 5.7-2 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
Federal	
United States Code	
Resource Conservation and Recovery Act (RCRA), Title 42, Chapter 82	**Yes.** With implementation of **HAZ-4** and **HAZ-7** through **HAZ-9**, **WORKER SAFETY-1** and **WORKER SAFETY-2**, and compliance with DTSC LORs
Toxic Substances Control Act (TSCA), Title 15, Chapter 53	**Yes.** With implementation of **HAZ-7** through **HAZ-9**, **WORKER SAFETY-1** and **WORKER SAFETY-2**, and compliance with DTSC LORs
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Title 42, Chapter 103	**Yes.** With implementation of **HAZ-1** through **HAZ-3**, **WORKER SAFETY-1** and **WORKER SAFETY-2**, and compliance with DTSC LORs
Hazardous Materials Transportation Act (HMTA), Title 49, Subtitle III, Chapter 51	**Yes.** With implementation of **HAZ-1** through **HAZ-3**, **WORKER SAFETY-1** and **WORKER SAFETY-2**, and compliance with DOT LORs
Code of Federal Regulations	
The SPCC Rule, Title 40, Chapter I, Subchapter D, Part 112 – Oil Pollution Prevention	**Yes.** With implementation of **HAZ-1**
DOT, Title 49, Subtitle B, Chapter I, Subchapter C, Parts 171-180	**Yes.** With implementation of **HAZ-1** through **HAZ-3**, **WORKER SAFETY-1** and **WORKER SAFETY-2**, and compliance with DOT LORs
State	
California Health and Safety Code	
California Hazardous Waste Control Law, Division 20, Chapter 6.5	**Yes.** With implementation of **HAZ-4** and **HAZ-7** through **HAZ-9**, **WORKER SAFETY-1** and **WORKER SAFETY-2**, and compliance with DTSC LORs
Aboveground Petroleum Storage Act Program, Division 20, Chapter 6.67	**Yes.** With implementation of **HAZ-1** through **HAZ-3** and compliance with the SPCC Rule
Hazardous Materials Release Response Plans and Inventory Law, Division 20, Chapter 6.95	**Yes.** With implementation of **HAZ-1** through **HAZ-3**, **WORKER-SAFETY-1** and **WORKER SAFETY-2**, and compliance with DTSC LORs
Unified Hazardous Waste and Hazardous Materials Management Regulatory Program, Division 20, Chapter 6.11	**Yes.** With implementation of **HAZ-7** through **HAZ-9, WORKER SAFETY-1** and **WORKER SAFETY-2**, and compliance with DTSC LORs
California Code of Regulations	
Transportation of Hazardous Materials on California Highways, Title 13, Division 2, Chapter 6, Article 3	**Yes.** With implementation of **HAZ-1** through **HAZ-3**, **WORKER SAFETY-1** and **WORKER SAFETY-2**, and compliance with DOT LORs
Cal/OSHA Department of Industrial Safety, Title 8, Division 1, Chapter 4, Subchapter 7, Group 16	**Yes.** With implementation of **WORKER SAFETY-1** and **WORKER SAFETY-2**

TABLE 5.7-2 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
Environmental Health Standards for the Management of Hazardous Waste, Title 22, Division 4.5	**Yes.** With implementation of **HAZ-7** through **HAZ-9, WORKER SAFETY-1** and **WORKER SAFETY-2**, and compliance with DTSC LORs
Local	
Imperial County General Plan	
Seismic and Public Safety Element	
Goal 2: Minimize potential hazards to public health, safety, and welfare and prevent the loss of life and damage to health and property resulting from both natural and human-related phenomena. Goal 3: Protect the public from exposure to hazardous materials and wastes.	**Yes**. With implementation of **HAZ-1** through **HAZ-3**, **HAZ-5** and **HAZ-6,** and **WORKER SAFETY-1** and **WORKER SAFETY-2**
Renewable Energy and Transmission Element	
Goal 7: Actively minimize the potential for land subsidence to occur as a result of renewable energy operations. Objective 7.10: Require operators of geothermal facilities to establish a notification system to warn or notify surrounding residents of the accidental release of potentially harmful emissions as part of an emergency response plan.	**Yes**. With implementation of **HAZ-5** and **HAZ-6**, and **WORKER SAFETY-1** and **WORKER SAFETY-2**
Imperial County Certified Unified Program Agency, Department of Toxic Substances Control	**Yes**. With implementation of **HAZ-1** through **HAZ-3**, **WORKER SAFETY-1,** and **WORKER SAFETY-2**
Imperial County Ordinance	
Emergency Response Plan, Title 9, Division 17, § 91702.00.C	**Yes**. With implementation of **HAZ-1** through **HAZ-3**, **HAZ-5** and **HAZ-6**, and **WORKER SAFETY-1,** and **WORKER SAFETY-2**
Minimize Possibility of Fire Explosion Collision or Release of Hazardous Materials, Title 9, Division 17, § 91702.00.J	**Yes**. With implementation of **HAZ-1** through **HAZ-3**

5.7.4 Conclusions and Recommendations

As discussed above, with implementation of COCs, the project would have a less than significant impact related to hazards, hazardous materials/waste and wildfire and would conform with applicable LORS. Staff recommends adopting the COCs as detailed in subsection "5.7.5 Proposed Conditions of Certification" below.

5.7.5 Proposed Conditions of Certification

The following proposed COCs include measures to both mitigate environmental impacts and ensure conformance with applicable LORS. The conditions below are enforceable as part of the CEC's certificate for the portions of the project constituting the site and related facility. Additional impacts associated with project components outside of CEC's jurisdiction, such as the well complex licensed by the CalGEM, the temporary structures

such as the laydown yard to be permitted by Imperial County and switching station to be permitted by IID, require mitigation to be less than significant.

This CEQA analysis evaluates all impacts resulting from all aspects of the project, and for the entire project to have less than significant impacts, the mitigation actions described in these COCs would need to be implemented by the various licensing jurisdictions as mitigation measures (MMs). For purposes of the facility certification issued by CEC, the following COCs must be complied with by the applicant on the jurisdictional site and related facilities as delineated in the Project Description, Section 3.1. Verifications set forth below only apply to the COCs, not the MMs.

COC HAZ-1/MM HAZ-1 The project owner shall prepare a Hazardous Materials Business Plan (HMBP) and a Spill Control and Countermeasure Plan (SPCC) and provide these plans to the California Department of Toxic Substances Control (DTSC) for review and comment and to the Compliance Project Manager (CPM) for review and approval.

Verification: At least 60 days prior to the start of operation the project owner shall prepare and submit the HMBP and SPCC to the DTSC for review and comment and to the CPM for review and approval. The project owner shall also provide the CPM with a copy of the transmittal letter to DTSC requesting review and comment.

At least 30 days prior to the start of operation, the project owner shall provide copies of any comment letters received from DTSC along with any changes to the HMBP and SPCC plans for CPM review and approval. After CPM review and approval, the project owner shall provide complete copies of the final HMBP and SPCC to the DTSC, sending copies of the correspondence to the CPM.

COC HAZ-2 After the start of project operation, the project owner shall not use or change the quantity of hazardous materials that would require a change in the project's HMBP unless approved in advance by the CPM.

Verification: At least 30 days prior to changing the quantity of or using a new hazardous material onsite, the project owner shall notify and seek approval from the CPM. The project owner shall provide to the CPM, in the Annual Compliance Report, the HMBP's list of hazardous materials and quantities contained at the facility.

COC HAZ-3 The project owner shall develop and implement a Safety Management Plan for delivery of bulk chemicals. The plan shall include procedures, protective equipment requirements, training, and a checklist for each bulk chemical. It shall also include a section describing all measures to be implemented to prevent mixing of incompatible hazardous materials including provisions to maintain lockout control by a power plant employee not involved in the delivery or transfer operation. This plan shall be applicable during construction, commissioning, and operation of the power plant.

Verification: At least 30 days prior to the delivery of any bulk chemicals to the facility, the project owner shall provide a Safety Management Plan as described above to the CPM for review and approval.

COC HAZ-4 The project owner shall report new or temporary hazardous waste generator identification numbers from the United States Environmental Protection Agency (USEPA) prior to generating any hazardous waste during demolition, construction, or operations.

Verification: The project owner shall keep a copy of the identification number(s) on file at the project site and provide documentation of the hazardous waste generation and notification and receipt of the number to the CPM in the next scheduled Monthly Compliance Report after receipt of the number. Submittal of the notification and issued number documentation to the CPM is only needed once, unless there is a change in ownership, operation, waste generation, or waste characteristics that requires a new notification to USEPA. Documentation of any new or revised hazardous waste generation notifications or changes in identification number shall be provided to the CPM 30 days before the change occurs.

COC HAZ-5/MM HAZ-5 Prior to commencing construction, a site-specific Construction Site Security Plan for the construction phase shall be prepared and made available to the CPM for review and approval.

The Construction Site Security Plan shall include the following:

1. perimeter security consisting of fencing enclosing the construction area;
2. security guards during hours when construction personnel are not present at the site;
3. site access control consisting of a check-in procedure or tag system for construction personnel and visitors;
4. written standard procedures for employees, contractors, and vendors when encountering suspicious objects or packages on site or off site;
5. protocol for contacting law enforcement and the CPM in the event of suspicious activity, incident or emergency; and,
6. evacuation procedures.

Verification: At least 30 days prior to commencing construction, the project owner shall notify the CPM that a site-specific Construction Security Plan is available for review and approval.

COC HAZ-6/MM HAZ-6 The project owner shall also prepare a site-specific security plan for the commissioning and operational phases that would be available to the CPM for review and approval. The project owner shall implement site security

measures that address physical site security and hazardous materials storage. The level of security to be implemented shall not be less than that described below (as per the latest version of the NERC Security Guideline for the Electricity Sector: Physical Security).

The Operation Security Plan shall include the following:

1. permanent full perimeter fence or wall, at least eight feet high and topped with barbed wire or the equivalent (and with slats or other methods to restrict visibility if a fence is selected);
2. main entrance security gate, either hand operated or motorized;
3. evacuation procedures;
4. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency;
5. written standard procedures for employees, contractors, and vendors when encountering suspicious objects or packages on site or off site;
    A. a statement (refer to sample, **Attachment A**), signed by the project owner certifying that background investigations have been conducted on all project personnel. Background investigations shall be restricted to determine the accuracy of employee identity and employment history and shall be conducted in accordance with state and federal laws regarding security and privacy;
    B. a statement(s) (refer to sample, **Attachment B**), signed by the contractor or authorized representative(s) for any permanent contractors or other technical contractors (as determined by the CPM after consultation with the project owner), that are present at any time on the site to repair, maintain, investigate, or conduct any other technical duties involving critical components (as determined by the CPM after consultation with the project owner) certifying that background investigations have been conducted on contractors who visit the project site;
6. site access controls for employees, contractors, vendors, and visitors;
7. a statement(s) (refer to sample, **Attachment C**), signed by the owners or authorized representative of hazardous materials transport vendors, certifying that they have prepared and implemented security plans in compliance with 49 CFR 172.880, and that they have conducted employee background investigations in accordance with 49 CFR Part 1572, subparts A and B;
8. closed circuit TV (CCTV) monitoring system, recordable, and viewable in the remote power plant control room with cameras able to pan, tilt, and zoom, have low-light capability, and able to view 100 percent of the perimeter fence, and outside entrances to the site; and,

9. additional measures to ensure adequate perimeter security consisting of either:

   A. perimeter breach detection or onsite motion detector capabilities; and

   B. security guard(s) present 24 hours per day, seven days per week; **or**

   C. power plant personnel on site 24 hours per day, seven days per week.

The project owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to those security plans. The CPM may authorize modifications to these measures, or may require additional measures such as protective barriers for critical power plant components— transformers, gas lines, and compressors—depending upon circumstances unique to the facility or in response to industry-related standards, security concerns, or additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or the North American Electrical Reliability Corporation (NERC), after consultation with both appropriate law enforcement agencies and the project owner.

Verification: At least 30 days prior to the initial receipt of hazardous materials onsite, the project owner shall notify the CPM that a site-specific operations site security plan is available for review and approval. In the annual compliance report, the project owner shall include signed statements similar to Attachments A and B that all current project employee and appropriate contractor background investigations have been performed, and that updated certification statements have been appended to the operations security plan. In the annual compliance report, the project owner shall include a signed statement similar to Attachment C that the operations security plan includes all current hazardous materials transport vendor certifications for security plans and employee background investigations.

COC HAZ-7/MM HAZ-7 The project owner shall prepare and submit to the CPM a Site Management Plan (SMP) prior to any ground disturbing activities. The SMP shall be prepared by a California Registered Civil Engineer or a California Registered Geologist with sufficient experience in hazardous waste management. The purpose of the SMP is to establish appropriate management practices and procedures for handling impacted soil and/or groundwater or other materials that may be encountered during construction activities to ensure worker protection from toxicant exposure. The SMP shall be updated as needed to reflect changes in laws, regulations or site conditions. All ground disturbing activities at the site and potential disposal of contaminated soil and/or groundwater shall be conducted in accordance with the SMP. Where actions are required in accordance with the SMP, an SMP summary report, which includes all analytical data and other findings, shall be submitted once the earthwork has been completed.

Topics covered by the SMP shall include, but not be limited to:

1. Land use history including description and locations of any known contamination.
2. The nature and extent of any previous investigations and remediation at the site.
3. The nature and extent of any unremediated contamination at the proposed site.
4. A listing and description of institutional controls such as the county's excavation ordinance and other local, state, and federal regulations and laws that would apply to the project.
5. Names and positions of individuals involved with site management and their specific roles.
6. An earthwork schedule.
7. A description of protocols for the investigation and evaluation of any previously unidentified contamination that may be encountered in time. The protocol shall be for temporary and permanent controls that may be required to reduce exposure to onsite workers, visitors, and the public.
8. A site-specific Health and Safety Plan (HSP) to be implemented by all contractors and subcontractors at the site. The HSPs shall be specific to each of the contractors' or subcontractors' scopes of work. The HSPs shall be prepared by a Certified Industrial Hygienist and would protect onsite workers by including engineering controls, personal protective equipment, monitoring, and security to prevent unauthorized entry and to reduce construction related hazards. The HSPs shall address the possibility of encountering subsurface chemical contamination and include procedures to protect workers and the public. The HSPs shall be updated as needed if site conditions change significantly, such as discovery of contaminated soil or groundwater. Copies of the approved HSPs shall be kept at the project site.
9. Hazardous waste determination and disposal procedures for known and previously unidentified contamination.
10. Requirements for site-specific techniques at the site to minimize dust, manage stockpiles, run-on and run-off controls, waste disposal procedures, etc.
11. Copies of relevant permits or closures from regulatory agencies.

Verification: At least 45 days prior to any ground disturbance, the project owner shall submit the SMP to the DTSC for review and comment and to the CPM for review and approval. An SMP summary shall be submitted to the CPM within 30 days of completion of any ground disturbance.

COC HAZ-8/MM HAZ-8 The project owner shall provide the resume of an experienced and qualified professional engineer or professional geologist, who shall be available for consultation during site characterization (if needed), demolition, excavation,

and grading activities, to the CPM for review and approval. The resume shall reflect experience in remedial investigation and feasibility studies.

The professional engineer or professional geologist shall be given full authority by the project owner to oversee any earth moving activities that have the potential to disturb contaminated soil and/or groundwater.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit the resume to the CPM for review and approval.

COC HAZ-9/MM HAZ-9 If seemingly contaminated soil and/or groundwater is identified during site characterization, demolition, excavation, or grading at either the proposed site or linear facilities (as evidenced by discoloration, odor, detection by handheld instruments, or other signs), the professional engineer or professional geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and provide a written report to the project owner, representatives of DTSC, and the CPM stating the recommended course of action.

Depending on the nature and extent of contamination, the professional engineer or professional geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If, in the opinion of the professional engineer or professional geologist, significant remediation may be required, the project owner shall contact the CPM and representatives of the DTSC for guidance and possible oversight.

Verification: The project owner shall submit any final reports filed by the professional engineer or professional geologist to the CPM within 5 days of their receipt. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

SAMPLE CERTIFICATION (Attachment A)

Affidavit of Compliance for Project Owners

I,

_____

(Name of person signing affidavit) (Title)

do hereby certify that background investigations to ascertain the accuracy of the identity and employment history of all employees of

_____

(Company name)

for employment at

_____

(Project name and location)

have been conducted as required by the California Energy Commission Decision for the above-named project.

_____

(Signature of officer or agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

SAMPLE CERTIFICATION (Attachment B)

Affidavit of Compliance for Contractors

I,

_____

(Name of person signing affidavit) (Title)

do hereby certify that background investigations to ascertain the accuracy of the identity and employment history of all employees of

_____

(Company name)

for contract work at

_____

(Project name and location)

have been conducted as required by the California Energy Commission Decision for the above-named project.

_____

(Signature of officer or agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

SAMPLE CERTIFICATION (Attachment C)

Affidavit of Compliance for Hazardous Materials Transport Vendors

I,

_____

(Name of person signing affidavit) (Title)

do hereby certify that the below-named company has prepared and implemented security plans in conformity with 49 CFR 172.880 and has conducted employee background investigations in conformity with 49 CFR 172, subparts A and B,

_____

(Company name)

for hazardous materials delivery to

_____

(Project name and location)

as required by the California Energy Commission Decision for the above-named project.

_____

(Signature of officer or agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

5.7.6 References

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5.8 Land Use, Agriculture, and Forestry

Andrea Koch

5.8.1 Environmental Setting

Existing Conditions

The Morton Bay Geothermal Project (MBGP or project) would be on 51 acres of a 160-acre parcel (APN 020-100-007) in Imperial County near the southeastern shore of the Salton Sea in the Salton Sea Known Geothermal Resource Area (KGRA) (Jacobs 2023a, p. 2-1; Jacobs 2023kk, Figure 1-4R). The boundaries of the project site are the Salton Sea to the west, Davis Road to the east, Schrimpf Road to the south, and McDonald Road to the north (Jacobs 2023a, p. 1-1). The project site is currently disturbed with vegetation (Jacobs 2023kk, Figure 5.2-4R).

The project also includes ancillary, offsite components such as production and injection wells, aboveground production and injection pipelines, and a water supply pipeline. The production and injection wells, and any production or injection pipelines running between the wells, are under the jurisdiction of the California Geologic Energy Management Division (CalGEM) of the Department of Conservation and Imperial County (Department of Conservation 2024a). However, any aboveground production and injection pipelines connecting directly from a well to the power plant would be under the jurisdiction of the California Energy Commission (CEC). An approximately 3.2-mile-long aboveground generation tie line (gen-tie) would connect the power plant with the switching station, south of the project at Garst and Sinclair Roads, adjacent to the applicant's proposed Elmore North Geothermal Project (ENGP) (Jacobs 2023a, pp. 1-2 and 3-1). The switching station would be shared between the MBGP and the applicant's other two proposed geothermal projects, the ENGP and the Black Rock Geothermal Project (BRGP) (Jacobs 2023a, p. 5.11-12).

Temporary offsite project components that could be used as needed during construction include up to ten laydown and parking yards, two construction camps, and up to four temporary borrow pits, for a total of 16 sites which would be shared between the MBGP, the BRGP, and the ENGP (Jacobs 2023kk, Figure 1-4R). These offsite construction areas are within five miles of the project site.

The only permanent project components which would be sited on active agricultural lands are the transmission line and switching station, which would be on land mostly used for growing Bermuda grass seed. Many of the temporary project components cross active or fallowed agricultural lands, with the most common crops being alfalfa and Bermuda grass seed (Jacobs 2023ww). Wherever possible, the project's production and injection pipelines would be placed next to the borders of fields or along access roads to minimize the amount of land affected. The project's gen-tie line would be built immediately

adjacent to existing road rights-of-way where possible to minimize land affected (Jacobs 2023a, p. 2-45).

Major land uses in the area include agriculture, other geothermal plants, including the Hudson Ranch Power Plant east of the site, and utility-scale solar power plants (Jacobs 2023a, pp. 1-1 and 2-10). From the project site, the Sonny Bono Wildlife Refuge Headquarters is approximately two miles to the southwest, and the Alamo River is approximately 0.25 miles to the southwest. Nearby towns are Niland, approximately four miles northeast of the project site, and Calipatria, approximately six miles southeast of the plant site (Jacobs 2023a, p. 1-1). The project site is within military airspace areas, including an area classified as Special Use Airspace – Low Altitude – Military Operation Area (MOA), as well as Military Training Route – Visual and Military Training Route Corridor – Visual (U.S. Army Corps 2024). These are associated with nearby military areas including Naval Air Facility El Centro, the Target 101 Shade Tree Bombing Range, and the Chocolate Mountain Aerial Gunnery Range.

The CEC certificate is only in lieu of local permits for use of the project site and related facilities (Pub. Resources Code §§ 25500, 25110, 25119; Cal. Code. Regs., tit. 20, § 1201 (q)). The CEC has jurisdiction over the power plant, the gen-tie line, the water line, and any aboveground production and injection pipelines connecting directly from a well to the power plant. The production and injection wells, and any production or injection pipelines running between the wells and not directly connecting to the power plant, are under the jurisdiction of CalGEM and Imperial County (Department of Conservation 2024a). The switching station would be under the jurisdiction of IID. The temporary offsite project components (laydown and parking yards, construction camps, and borrow pits) would be under the jurisdiction of Imperial County.

Regulatory

There are many local laws, ordinances, regulations, and standards (LORS) relating to land use and agriculture that would apply to the project. The sources of these LORS are discussed below, and a discussion of consistency with these LORS is found later in **5.8.3 Project Conformance with Applicable LORS**.

Federal

No federal LORS related to land use, agriculture, and forestry are applicable to the project.

State

No state LORS related to land use, agriculture, and forestry are applicable to the project.

Local

Imperial County General Plan. The Imperial County General Plan includes policies relating to land use and agriculture which pertain to the proposed project, discussed later

in this section (Imperial County 2015a; Imperial County 2015b; Imperial County 2015c; and Imperial County 2016).

Imperial County Land Use Ordinance The Imperial County Land Use Ordinance includes discussion of allowed uses and development standards for parcels in various zoning districts, including minimum side, front, and rear setbacks, and maximum height, discussed later in this section (Imperial County 2023). These allowed uses and development standards would apply to the project.

Cumulative

There are other pending projects in the vicinity of the project. Impacts from these projects could potentially combine with impacts from the MBGP to cause significant cumulative impacts. The projects that comprise the cumulative setting for Land Use, Agriculture, and Forestry are the projects listed in **Section 1 Executive Summary**, **Table 1-2** that are on Important Farmland as defined by the Department of Conservation's Farmland Mapping and Monitoring Program (FMMP). Important Farmland is land classified by the FMMP as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland. The projects fully or partially on Important Farmland and therefore comprising the cumulative setting for Land Use, Agriculture, and Forestry are:

- Elmore North Geothermal Project – geothermal project
- Black Rock Geothermal Project – geothermal project
- Midway IV – solar project
- Nider – solar project
- Wilkinson Solar Farm (Calipal Solar Farm I) – solar project

5.8.2 Environmental Impacts

LAND USE, AGRICULTURE, AND FORESTRY	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Would the project physically divide an established community?	☐	☐	☐	☒
b. Would the project 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?	☐	☒	☐	☐
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				

LAND USE, AGRICULTURE, AND FORESTRY	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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.				
c. Would the project 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?	☐	☒	☐	☐
d. Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☒	☐	☐
e. Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code, section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code, section 51104(g))?	☐	☐	☐	☒
f. Would the project result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
g. Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, land use and planning and agriculture and forestry resources.

5.8.2.1 Methodology and Thresholds of Significance

In addition to evaluating the proposed project according to the provisions in CEQA codified in Pub. Resources Code § 21000 and following, and the CEQA Guidelines codified in California Code of Regulations (Cal. Code Regs., tit. 14, § 15000 et seq.), staff used the following methodology and thresholds to evaluate the project's impacts to agriculture.

Methodology

LESA Model

Staff used the California Agricultural Land Evaluation and Site Assessment Model (1997) (LESA Model), a model prepared by the California Department of Conservation as an optional tool to use in assessing a project's impacts on agriculture and farmland. The LESA Model helps determine whether a project's impacts to agriculture and farmland are significant by scoring "Land Evaluation" factors (types of affected soils) and "Site Assessment" factors (size of the project, availability of water resources for irrigation, amount of surrounding agriculture, and amount of surrounding protected resource lands) (Department of Conservation 1997).

Thresholds of Significance

A project's final score provided by the LESA Model helps determine whether the project's impacts to agriculture and farmland are significant. The scoring is as follows (Department of Conservation 1997):

- 0 to 39 points – Not Considered Significant
- 40 to 59 points – Considered Significant only if "Land Evaluation" and "Site Assessment" subscores are each greater than or equal to 20 points
- 60 to 79 points – Considered Significant unless either "Land Evaluation" or "Site Assessment" subscore is less than 20 points
- 80 to 100 points – Considered Significant

For staff's calculations using the LESA Model, see **Appendix A**.

5.8.2.2 Direct and Indirect Impacts

a. Would the project physically divide an established community?

Construction

No Impact. Construction activities would not physically divide an established community. Construction of linears would often occur along or across roads, but staff's proposed **TRANS-1** would ensure that road access is maintained. **TRANS-1** would require the project owner to submit and implement a construction management plan addressing any road or lane closures, as well as maintenance of emergency access and access to nearby residential and commercial properties. (See **Section 5.14 Transportation** for more

information.) Construction activities at temporary sites, such as construction laydown and parking areas, borrow pits, and construction camps, would occur on parcels which do not serve as links between communities or parts of a community. For these reasons, construction activities would not physically divide an established community, and there would be no impact.

Operation

No Impact. The permanent, operational project structures would not physically divide an existing community. The power plant would occupy one vacant, disturbed parcel that does not serve as a link between communities or parts of a community. The offsite ancillary facilities, including production and injection wells and production and injection pipelines, would not obstruct any roadways, sidewalks, or bikeways, and therefore, the project would not prevent pedestrian, bike, or vehicular movement between different areas of the community. Injection pipelines, which would normally be aboveground, would be undergrounded at road crossings (West Schrimpf Road and Davis Road) (Jacobs 2023a, p. 5.6-2) to avoid road obstruction. Although part of the project's gen-tie line is within the Sonny Bono Salton Sea Wildlife Refuge (SBSSWR) (Jacobs 2023kk, Figure 1-4R), the gen-tie line would not obstruct any access to or within the SBSSWR.

Because the operational project would not obstruct any roadways, sidewalks, bikeways, trails, or properties that serve as a link between communities or areas of a community, the project would not physically divide an existing community, and there would be no impact.

b. Would the project 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?

Construction

Less Than Significant with Mitigation Incorporated. Project construction impacts could result from the ten temporary laydown and parking yards, two temporary construction camps, and up to four temporary borrow pits, for a total of 16 sites. Most of these sites would be shared between the MBGP and the applicant's other two proposed geothermal projects, the BRGP and the ENGP (Jacobs 2023a, p. 1-2; Jacobs 2023kk, Figure 1-4R). An analysis of these temporary sites' compatibility with the Imperial County General Plan and Imperial County Land Use Ordinance is below. These temporary sites are all in the Imperial County General Plan land use designation of Agriculture (Jacobs 2023kk, Figure 5.6-1R).

Temporary Laydown and Parking Yards. The project could include up to ten temporary laydown and parking yards, two of which are on or adjacent to the project site (Jacobs 2023kk, Figure 1-4R). These areas would include mobile trailers or modular offices, parking for construction workers and visitors, and temporary utilities such as generators and lighting (Jacobs 2023a, pp. 2-44 to 2-45). Permitting of these offsite laydown and parking yards would be under the jurisdiction of Imperial County.

The Imperial County zoning designation for most of the laydown and parking yards is A-3-G (Heavy Agriculture with a Geothermal Overlay) (Imperial County 2024). According to Section 90509.02 of the Imperial County Land Use Ordinance, the laydown and parking yards would require a Conditional Use Permit (CUP) from Imperial County for location in the A-3-G zoning district. The laydown and parking yards would qualify as "temporary construction yard/office" uses allowed with a CUP under Section 90509.02(ccc) of the Imperial County Land Use Ordinance (Imperial County 2023; ICPDS 2023c).

The laydown and parking areas just north and south of the proposed project site are zoned S-1-G (Open Space/Recreational with a Geothermal Overlay) (Imperial County 2024). The laydown and parking yards would qualify as a "contractor's office and storage yard (temporary)" under Section 90518.02(f) of the Imperial County Land Use Ordinance (Imperial County 2023; ICPDS 2023c). These laydown and parking yards would also require a CUP.

Imperial County stated in a comment letter that laydown and parking yards are not subject to development standards (ICPDS 2023c).

Temporary Construction Camps. The project could include up to two temporary construction camps with up to 750 trailer/RV sites in total, although the applicant states that construction workers would more likely stay at existing off-site locations such as hotels/motels and recreational vehicle parks and campgrounds (Jacobs 2023a, p. 5.12-10; Jacobs 2023kk, Figure 1-4R; Jacobs 2023bb, p. 7-1). The applicant expects that any construction camps would include a temporary power drop, temporary potable water tank, and a temporary sanitary station (Jacobs 2023bb, p. 7-2). Site surface preparation for construction camps would include vegetation removal, excavation, minor grading as needed to level the surface, and gravel application (Jacobs 2023bb, p. 7-2).

These camps would be under the jurisdiction and permitting authority of Imperial County. The construction camps would be on land zoned A-3-G (Heavy Agriculture with a Geothermal Overlay), where they would be allowed as "labor camps" with a CUP under Section 90509.02(ll) of the Imperial County Land Use Ordinance (Imperial County 2023; ICPDS 2023c; Jacobs 2023kk, Figure 1-4R).

Temporary Borrow Pits. Two of the borrow pits would be in the A-3-G (Heavy Agriculture with a Geothermal Overlay) zoning district. The easternmost borrow pit site is zoned A-2-R-G (General Agricultural/Rural with a Geothermal Overlay). The northernmost borrow pit site is zoned M-2-G-PE (Medium Industrial with a Geothermal and Pre-Existing Allowed/Restricted Overlay) (Imperial County 2024; Jacobs 2023kk, Figure 1-4R). The borrow pits would be considered "mining and mineral extraction" under Section 90509.02(pp) of the Imperial County Land Use Ordinance and would therefore be allowed in the A-3 zoning district with a CUP from Imperial County (Imperial County 2023, ICPDS 2023c). The borrow pits would also be allowed with a CUP in the A-2-R-G zoning district as "resource extraction and energy development" under Section 90508.02(vv) of the Imperial County Land Use Ordinance (Imperial County 2023). Finally, the borrow pits would be allowed with a CUP in the M-2-G-PE zoning district under Section

90516.02(z) as "surface mining" (Imperial County 2023). The borrow pits would be under the jurisdiction of Imperial County, not the CEC, as the CEC certificate is only in lieu of local permits for use of the project site and related facilities.

A discussion of Imperial County's CUP findings, and the project's consistency with these findings, is included below under "Operation" impacts. Although the project is consistent with the required CUP findings, staff has proposed **LAND-1** to ensure that the project would comply with Imperial County LORS during construction. **LAND-1** would require that, prior to development of any temporary construction camps, laydown and parking areas, and borrow pits for project construction activities, the project owner shall acquire the required CUP permits from the Imperial County Planning & Development Services Department. The project owner shall submit these permits to the CEC Compliance Project Manager (CPM) to ensure compliance with local regulations. **LAND-1** would also require the project owner to ensure that local LORS are complied with during construction, operation, and restoration of the temporary construction camps, laydown/parking areas, and borrow pits.

Construction areas, such as laydown and parking areas, may encroach on IID properties, rights-of-way, or easements, such as areas of existing IID transmission lines and canals. Any potential encroachment on IID properties, rights-of-way, or easements would require an encroachment permit from IID to ensure that development would not cause impacts to IID's system for delivering water and power (IID 2023j). Imperial County, through its permitting of the project, would ensure that the applicant obtains any necessary encroachment permits for the facilities under its jurisdiction. For construction of facilities under the CEC's jurisdiction that could require encroachment permits, including the water supply pipeline and gen-tie line, **LAND-2** would require the project owner to obtain encroachment permits from IID for applicable activities.

With implementation of **LAND-1** and **LAND-2**, compliance with local LORS would be ensured during construction, and project construction impacts resulting from a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect would be less than significant.

Operation

Less Than Significant with Mitigation Incorporated. This section analyzes whether project operation activities could cause a significant impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Project operation impacts could result from permanent structures such as the power plant on the primary project site, as well as from permanent structures on ancillary sites such as the switching station, gen-tie line, production and injection wells, aboveground production and injection pipelines, and water supply pipeline (Jacobs 2023a, pp. 1-1 to 1-2; Jacobs 2023kk, Figure 1-4R). As discussed earlier, the CEC has jurisdiction over the power plant, gen-tie line, water supply line, and any production or injection pipelines directly connecting a well with the power plant. The CEC does not have jurisdiction over the switching station, wells, and any production or injection pipelines not

directly connecting a well with the power plant. However, the CEC must assess the entire project's consistency with local LORS as part of the licensing process, and for avoiding LORS inconsistencies which could result in environmental impacts.

The project site and locations of permanent offsite project components have a land use designation of Agriculture under the Imperial County General Plan, although there is an Open Space/Recreation General Plan land use designation immediately to the west of Garst Road along the alignment of part of the gen-tie line (Imperial County 2024; Jacobs 2023kk, Figure 5.6-1R). If the gen-tie line is along the west side of Garst Road, a portion of it would be in the Open Space/Recreation General Plan land use designation. The General Plan includes land use policies pertaining to the proposed project. See **Table 5.8-1: Conformance with Applicable LORS** later in this section for a discussion of these policies and the project's consistency. Although the General Plan land use designation of Agriculture does not normally allow for geothermal plants, the project sites' zoning designations allow for the geothermal project and its components with a CUP. The project sites have overlays of "Geothermal" or "Renewable Energy", meaning that Imperial County has found these areas suitable for geothermal development. (See the discussion below for more details on project zoning.) The Imperial County General Plan also has a Renewable Energy and Transmission Element which supports geothermal and other forms of renewable energy development (Imperial County 2015c).

The power plant, production wells and pipelines, part of the injection pipeline, and part of the water supply pipeline are in the S-1-G zoning district (Open Space/Recreational with a Geothermal Overlay) (Imperial County 2024; Jacobs 2023kk, Figure 1-4R). These project components are classified as "major facilities relating to the generation and transmission of electrical energy" under the S-1-G zoning district, which would be allowed with a CUP under Section 90518.02(m) of the Imperial County Land Use Ordinance (Imperial County 2023; ICPDS 2023c). However, the power plant would exceed the height limit of 35 feet in the S-1-G zoning district (Imperial County 2023) and would therefore require a Variance from Imperial County if the CEC did not have jurisdiction. CEC staff must analyze the project's compliance with local LORS and determine whether Imperial County's required findings for a Variance can be made. Staff determined that the findings can be made, as discussed later in this section.

Two of the injection well pads, part of the injection pipeline, and most of the water supply pipeline are in the M-2-G-PE zoning district (Medium Industrial with a Geothermal and Pre-Existing Allowed/Restricted Overlay) (Imperial County 2024; Jacobs 2023kk, Figure 1-4R). The other two injection well pads (including the back-up injection well pad) and part of the injection pipeline are in the A-2-R-G (General Agricultural/Rural with a Geothermal Overlay) (Imperial County 2024; Jacobs 2023kk, Figure 1-4R). In both zoning districts, these are classified as "major facilities relating to the generation and transmission of electrical energy", which would be allowed with a CUP under Sections 90516.02(t) and 90508.02(pp) of the Imperial County Land Use Ordinance (Imperial County 2023; ICPDS 2023c).

The project's transmission line passes through the S-1-G (Open Space/Recreational with a Geothermal Overlay) zoning district, the A-3-G (Heavy Agricultural with a Geothermal Overlay) zoning district, and possibly the S-1-RE (Open Space/Recreational with a Renewable Energy Overlay) zoning district, depending on the side of Garst Road on which the transmission line would be located (Jacobs 2023kk, Figure 1-4R). The project's switching station would be in the A-3-G zoning district. The project's transmission line and switching station would be permitted by right within the A-3-G zoning district as "transmission lines, including supporting towers, poles, microwave towers, (and) utility substations" (Imperial County 2023, Section 90509.01w). The project's transmission line would be classified in the S-1-G and S-1-RE zoning districts as "major facilities relating to the generation and transmission of electrical energy", which would be allowed with a CUP under Section 90518.02(m) of the Imperial County Land Use Ordinance (Imperial County 2023; ICPDS 2023c).

To evaluate the project's consistency with the Imperial County Land Use Ordinance, the CEC must determine whether Imperial County's required findings for a CUP can be made for the project. Staff determined that the required findings can be made (see below). Imperial County also submitted a letter stating that it appears that CUP findings could be made for the project (ICPDS 2023c). A discussion of the required CUP findings, and the project's consistency, is below.

Conditional Use Permit Findings

The project meets Imperial County's CUP findings (Imperial County 2023, Section 90203.09) as follows:

a. The proposed use is consistent with the goals and policies of the adopted County General Plan.

   The Imperial County General Plan has a Renewable Energy and Transmission Element which supports geothermal projects and other forms of renewable energy development (Imperial County 2015c). Although the project site and its ancillary sites have the General Plan land use designation of Agriculture, which is not generally consistent with geothermal projects, the project sites' Geothermal and Renewable Energy zoning overlays would allow for the geothermal project and its components with a CUP. Objective 3.8 of the General Plan Agricultural Element states that renewable energy projects will be allowed within the Renewable Energy Overlay Zone with mitigation for agricultural impacts (Imperial County 2015a). Staff has proposed **LAND-3**, discussed in Section 5.8.2.2(c), to mitigate agricultural impacts from the project converting Important Farmlands to non-agricultural use.

   Also, the project is consistent with Objective 8.2 of the General Plan Conservation and Open Space Element, which states that all new renewable energy development should be focused within adopted Renewable Energy Overlay Zones (Imperial County 2016). All project sites have zoning overlays of either Geothermal or Renewable Energy, making the project consistent with this policy.

Objective 1.8 in the Agricultural Element of the Imperial County General Plan allows conversion of agricultural land to non-agricultural uses, including renewable energy, only when a clear and immediate need can be demonstrated, based on economic benefits, population projections and lack of other available land (including land within incorporated cities) for such non-agricultural use (Imperial County 2015a). The project is consistent with this. First, although the project site has a General Plan land use designation of Agriculture, it is not classified as Important Farmland by the Farmland Mapping and Monitoring Program. Also, the sites of permanent project structures, with the exception of the transmission line and switching station sites, are not in use for agricultural activities (Jacobs 2023ww). Furthermore, an immediate need for renewable energy can be demonstrated. The State of California has mandates to increase the use of renewable energy in the state. Large-scale renewable energy often needs large land areas only available in rural, and sometimes agricultural, areas. In addition, geothermal plants must be in an area with an adequate geothermal source, in terms of heat flows. The applicant selected this site in part due to its location in Imperial County's KGRA. Much of Imperial County's KGRA is on agricultural lands (Imperial County 2015c, p. 5, Figure 1; Department of Conservation 2020), making it difficult to avoid siting geothermal plants on agricultural lands. No superior siting alternatives were identified during this project's Alternatives analysis. For more information about alternatives to the proposed site, see **Section 8 Alternatives** of this document.

The project is also consistent with Economic Growth Goal 2 of the General Plan Land Use Element, which is to diversify employment and economic opportunities in the County while preserving agricultural activity. The project would increase revenue to the County and provide jobs and job training opportunities, as stated in comment letters from the Imperial Valley Economic Development Corporation, the Imperial County Workforce Development Board, and the Imperial Valley Regional Chamber of Commerce (IVEDC 2023m, ICWDB 2023l, IVRCC 2023k).

b. The proposed use is consistent with the purpose of the zone or subzone within which the use will be located.

   All permanent and temporary project components are on land with zoning that accommodates the components with a CUP. See the previous discussion of compatibility with zoning for more information.

c. The proposed use is listed as a use within the zone or subzone or is found to be similar to a listed conditional use according to the procedures of Section 90203.10.

   All permanent and temporary project components are listed as uses allowed with a CUP within their applicable zoning district. See the previous discussion of compatibility with zoning for more information.

d. The proposed use meets the minimum requirements of this Title applicable to the use and complies with all applicable laws, ordinances, and regulations of the County of Imperial and the State of California.

The proposed project meets the minimum requirements applicable to the use and complies with all applicable laws, ordinances, and regulations of the County of Imperial and the State of California. As discussed above, all project components are allowed with a CUP in their respective zones.

The proposed geothermal power plant meets the development standards of the S-1-G zoning district in the Imperial County Land Use Ordinance. The front building setback would meet and exceed the minimum front building setback of 25 feet from the edge of right-of-way or property line or 80 feet from center line or adjacent street, whichever is greater. Building setbacks would also meet and exceed the required minimums of 10 feet for the side and rear yards, as established by Section 90518.06 of the Imperial County Land Use Ordinance. However, the project would have multiple structures exceeding the maximum building height of 35 feet, as established in Section 90518.07 of the Imperial County Land Use Ordinance (Imperial County 2023). The tallest structures would be the project's Atmosphere Flash Tanks (AFTs) at approximately 95 feet tall (Jacobs 2023a, p. 5.6-13). Imperial County stated that an informal review indicated that the findings could be made for a Variance to allow the height exceedance (ICPDS 2023c). CEC staff concurs. The Variance findings are discussed later in this section.

The project is also generally consistent with the Imperial County General Plan, except for situations where there are inconsistencies between designations, such as the project's General Plan land use designation of Agriculture, which normally does not allow geothermal facilities, and the project's renewable energy overlay zones (Geothermal "G" and Renewable Energy "RE") which allow geothermal facilities with a CUP. Also, while the project's building height of 95 feet exceeds the General Plan's building height maximum of 50 feet for industrial development in the General Plan land use designation of Agriculture, the project site has a Geothermal zoning overlay, which allows geothermal projects with a CUP. Zoning regulations generally have more detailed development standards and allowed uses than the General Plan, so staff considers the project to be consistent with LORS due to its consistency with zoning and the findings needed to issue a Variance for height requirements.

e. The proposed use will not be detrimental to the health, safety, and welfare of the public or to the property and residents in the vicinity.

The proposed use would not be detrimental to the health, safety, and welfare of the public or to the property and residents in the vicinity. The use would not generate any significant nuisances or hazards. See the remainder of this staff assessment, especially **Section 5.1 Air Quality**, **Section 5.7 Hazards, Hazardous Materials/Waste, and Wildfire**, **Section 5.9 Noise and Vibration**, **Section 5.10 Public Health**, **Section 5.14 Transportation**, and **Section 6 Environmental Justice**.

f. The proposed use does not violate any other law or ordinance.

The proposed use does not violate any other law or ordinance. See **Table 5.8-1 Conformance with Applicable LORS**.

g. The proposed use is not granting a special privilege.

   The proposed use is not granting a special privilege. There are other geothermal and solar projects in the area. Most properties in the area have a geothermal or renewable energy zoning overlay that allows these uses with a CUP.

To evaluate the project's consistency with the Imperial County Land Use Ordinance, the CEC also must determine whether Imperial County's required findings for a Variance can be made for the project. As stated earlier, staff determined that the required findings can be made. Imperial County also submitted a letter stating that it appears that Variance findings could be made for the project (ICPDS 2023c). A discussion of the required Variance findings, and the project's consistency, is below.

Variance Findings. The project meets Imperial County's Variance findings (Imperial County 2023, Section 90202.08) as follows:

FINDINGS: Approval or conditional approval may be granted only if…the following findings can be made:

1. That there are special circumstances applicable to the property described in the variance application that do not apply generally to the property or class of use in the same zone or vicinity.

   The special circumstance applicable to the property that does not apply generally to property in the same zone is the property's location in the KGRA. Geothermal facilities need to be in areas with available geothermal resources such as those found in the KGRA, and these areas are limited.

2. That the granting of such variance will not be materially detrimental to the public welfare or injurious to the property or improvements in such zone or vicinity in which the property is located.

   The granting of such a Variance would not be materially detrimental to the public welfare or injurious to the property or improvements in the vicinity. The use would not generate any significant nuisances or hazards. See the remainder of this staff assessment, especially **Section 5.1 Air Quality**, **Section 5.7 Hazards, Hazardous Materials/Waste, and Wildfire**, **Section 5.9 Noise and Vibration**, **Section 5.10 Public Health**, **Section 5.14 Transportation**, and **Section 6 Environmental Justice**.

3. That because of special circumstances applicable to (the) subject property, including size, shape, topography, location or surroundings, the strict application of zoning laws is found to deprive (the) subject property of privileges enjoyed by other properties in the vicinity and under identical zone classifications.

   Because of the property's location in the KGRA, the strict application of zoning regulations for height in the S-1-G zone would deprive the property of the opportunity to use the geothermal resources in the KGRA by prohibiting the height needed for the AFTs. Other properties nearby in the KGRA that also have the Geothermal Overlay zoning district but not the S-1 height limitation are able to construct geothermal

facilities in the KGRA without the height limitation limiting the height of the AFTs. The strict application of zoning laws would deprive the MBGP facility of opportunities which are utilized by existing and similar geothermal facilities nearby.

4. That the granting of such variance will not adversely affect the comprehensive general plan.

   The granting of a Variance would not adversely affect the comprehensive General Plan. The Imperial County General Plan has a Renewable Energy and Transmission Element which supports geothermal projects and other forms of renewable energy development (Imperial County 2015c). Also, the project is consistent with Objective 8.2 of the General Plan Conservation and Open Space Element, which states that all new renewable energy development should be focused within adopted Renewable Energy Overlay Zones (Imperial County 2016). All project sites have zoning overlays of either Geothermal or Renewable Energy, making the project consistent with this policy.

LAND-1 would require that prior to any grading or development for the permanent project facilities under CEC jurisdiction, the project owner shall develop a site plan and submit it to the Imperial County Planning & Development Services Department for comment to ensure compliance with local regulations. **LAND-1** also would require the project owner to ensure that local regulations are complied with during construction and operation of the permanent project facilities.

As discussed earlier, parts of the project could encroach on IID property, rights-of-way, or easements. **LAND-2** would require the project owner to obtain encroachment permits from IID for operation of any project linears under the jurisdiction of the CEC (water supply pipeline, gen-tie line) on IID property or within its existing or proposed right-of-way or easements.

With implementation of **LAND-1** and **LAND-2**, and **LAND-3** for mitigation of agricultural impacts (discussed later in this section in more detail), operation of the project would not 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.

c. Would the project 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?[1]

1 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

Construction

Less Than Significant with Mitigation Incorporated. Activities in areas temporarily used for construction activities, such as temporary laydown and parking, construction camp areas, and borrow pits, would include land alterations such as minor grading, placement of gravel, and removal of vegetation (Jacobs 2023a, pp. 5.11-20 to 5.11-21). The applicant stated that immediately after completion of construction, all temporary work areas would either be restored to preconstruction conditions or left in conditions requested by the landowner (Jacobs 2023a, pp. 5.11-11 to 5.11-12).

The two potential construction camps would be on a combination of Prime Farmland and Farmland of Statewide Importance (Jacobs 2023a, Figure 5.11-2; Jacobs 2023kk, Figure 1-4R; Department of Conservation 2020). Of the ten potential laydown and parking areas, the project would most frequently use the two laydown and parking areas adjacent to the project on the south and north sides (Jacobs 2023a, page 5.4-1; Jacobs 2023kk, Figure 1-4R). These main laydown and parking areas are on "Other Land", as designated on Farmland Mapping and Monitoring Program (FMMP) maps (Department of Conservation 2020; Jacobs 2023kk, Figure 1-4R). "Other Land" is a non-agricultural designation defined by the FMMP as "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, borrow pits; and water bodies smaller than forty acres" (Department of Conservation 2024b).

The remaining laydown and parking areas would be on lands designated as Prime Farmland and Farmland of Statewide Importance (Department of Conservation 2020; Jacobs 2023kk, Figure 1-4R). Prime Farmland and Farmland of Statewide Importance are both Important Farmland categories. Prime Farmland is "Farmland with the best combination of physical and chemical features able to sustain long-term agricultural production…Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date" (Department of Conservation 2024b). Farmland of Statewide Importance is "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 four years prior to the mapping date" (Department of Conservation 2024b).

The four potential borrow pits would be on a combination of Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and "Other Land" (Jacobs 2023a, Figure 5.11-2; Department of Conservation 2020; Jacobs 2023kk, Figure 1-4R). As discussed earlier, Prime Farmland and Farmland of Statewide Importance are Important Farmland categories, while "Other Land" is not. According to Section 21060.1 of the California Public Resources Code, "Agricultural Land" means Prime Farmland, Farmland of Statewide Importance, or Unique Farmland. Farmland of Local Importance

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.

is "Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee" (Department of Conservation 2024b). It is not necessarily an Important Farmland category in CEQA analysis.

Borrow pits would provide fill for the project site if needed, although it is assumed that excavated materials from the project site would be suitable for backfill (Jacobs 2023a, pp. 2-39 and 5.11-21). Topsoil removed from the project site would be set aside and stockpiled at the borrow sites for use as topsoil in restoring the borrow sites to preconstruction conditions as much as possible (Jacobs 2023a, page 5.11-21). The applicant stated that they would submit to the California State Mining & Geology Board or its designee, such as Imperial County, a plan detailing the excavation and restoration of the borrow pits (Jacobs 2023a, page 5.11-25).

Grading and excavation at all of these temporary construction sites would disrupt topsoil and potentially alter the soil characteristics of Important Farmlands, including Prime Farmland and Farmland of Statewide Importance, in a way unsuitable for agriculture (Jacobs 2023a, page 5.11-19.) This could result in a potentially significant impact, especially at the borrow sites. To mitigate impacts to topsoil from grading and excavation, staff has proposed **LAND-4**. **LAND-4** would require the project owner to develop and implement a restoration plan which would include stockpiling topsoil and using it to restore the original conditions as closely as possible at sites of temporary construction activity.

With implementation of **LAND-4**, construction impacts to Important Farmlands would be less than significant.

Operation

Less Than Significant with Mitigation Incorporated. The project's permanent components are on the following acreages of Important Farmland, as defined by the Farmland Mapping and Monitoring Program. The estimated acreages for permanent impacts to Important Farmland include a 50-foot buffer around most permanent project components in which farming would not occur. The gen-tie line would have no buffer excluding farming activities (Jacobs 2023a, page 5.11-12).

The permanent project components and their associated area sited on important farmland are as follows:

Plant: 0 acres of Important Farmland (located on "Other Land")

Well Pads: 0 acres of Important Farmland (located on "Other Land")

Pipelines: 0 acres of Important Farmland (located on "Other Land")

Gen-tie Line: 0.10 acres of Farmland of Statewide Importance (although mostly located on "Other Land")

IID Switching Station: 6.15 acres of Farmland of Statewide Importance (shared with the proposed ENGP and BRGP)

This results in permanent impacts to approximately 6.15 acres of Farmland of Statewide Importance. To analyze whether these permanent impacts to Important Farmland would constitute significant impacts, staff used the California Agricultural Land Evaluation and Site Assessment (LESA) Model prepared by the California Department of Conservation as an optional model (Department of Conservation 1997). Staff used a basic LESA Model that did not account for the small amount of Important Farmland converted by the gen-tie line (0.10 acres); agricultural land converted by the gen-tie line would be negligible given that there would be no required buffer around it, and that farming could occur all around it. The LESA model also included just the footprint of the switching station, and not the buffer area that the applicant included in the above list. Even given the land conversion omitted from the LESA analysis, the results of the LESA Model indicate that the project would result in a significant impact to Important Farmland. The project scored approximately 54.75 points, falling in the scoring category of 40 to 59 points, which is significant if, as in this case, the "Land Evaluation" and "Site Assessment" subscores are each greater than or equal to 20 points. In this case, they are each greater than 20 points, so impacts are significant. For more details, see **Appendix A**.

To mitigate impacts to Important Farmlands, staff proposes **LAND-3**, which is based on Imperial County's Mitigation Monitoring and Reporting Program in the Final Programmatic Environmental Impact Report for the Imperial County Renewable Energy and Transmission Element Update. **LAND-3** would require the project owner to implement one of Imperial County's mitigation options for conversion of Important Farmlands. These options include procuring Agricultural Conservation Easements, paying an Agricultural In-Lieu Mitigation Fee, or paying an Agricultural Benefit Fee to Imperial County (Imperial County 2015). CEC staff notes that Imperial County's full list of mitigation measures for renewable energy project agricultural impacts can be found in the Final Programmatic Environmental Impact Report for the Imperial County Renewable Energy and Transmission Element Update, at the link below:

https://www.icpds.com/assets/planning/cec-alternative-energy-update/reports-and-documents/21-feir-cec-renewable-energy-mmrp.pdf

With implementation of **LAND-3**, impacts from project operation to Important Farmlands would be less than significant.

d. Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

Construction

Less Than Significant with Mitigation Incorporated. Temporary construction activities include the construction and use of ten temporary laydown and parking yards, two potential temporary construction camps, and up to four temporary borrow pits, for a total of 16 sites. Most of these sites would be shared between the MBGP and the applicant's

other two proposed geothermal projects, the BRGP and ENGP. All of these activities would be in the A-3 (Heavy Agriculture) zoning district, with the exception of the easternmost borrow pit in the A-2-R-G (General Agricultural/Rural with a Geothermal Overlay) zoning district, the northernmost borrow pit in the M-2-G-PE (Medium Industrial with a Geothermal and Pre-Existing Allowed/Restricted Overlay) and construction laydown and parking areas just north and south of the proposed Morton Bay Geothermal site in the S-1-G (Open Space/Recreational with a Geothermal Overlay) zoning district. The borrow pit in the M-2-G-PE zoning district and the construction laydown and parking areas in the S-1-G zoning district will not be discussed here because they are not in an agricultural zone.

According to Section 90509.02 of the Imperial County Land Use Ordinance, these temporary uses would require a CUP from Imperial County for location in the A-3 zoning district. The laydown and parking yards would qualify as "temporary construction yard/office" uses allowed with a CUP under Section 90509.02(ccc) of the Imperial County Land Use Ordinance. The construction camps would qualify as "labor camps" under Section 90509.02(ll) of the Imperial County Land Use Ordinance and would also be allowed in the A-3 zoning district with a CUP. Finally, the borrow pits would be considered "mining and mineral extraction of rock, gravel (and) sand" under Section 90509.02(pp) and would therefore be allowed in the A-3 zoning district with a CUP from Imperial County (Imperial County 2023, ICPDS 2023d). The borrow pit in the A-2-R-G zoning district would be allowed with a CUP as "resource extraction and energy development" under Section 90508.02(vv) of the Imperial County Land Use Ordinance (Imperial County 2023).

A discussion of Imperial County's required CUP findings, and the project's consistency with these findings, can be found earlier in this Land Use section in Section 5.8.2.2(b). CEC staff determined that the project meets Imperial County's requirements for findings for issuance of a CUP. **LAND-1**, which would require the project owner to acquire and submit to the CPM the required permits from the Imperial County Planning & Development Services Department, would further ensure that construction would not conflict with agricultural zoning. Therefore, with mitigation incorporated, construction of the project would not significantly conflict with existing zoning for agricultural use.

Construction of the project also would not conflict with any Williamson Act contracts. Imperial County no longer participates in the Williamson Act, and no project parcels are under a Williamson Act contract (Department of Conservation 2022).

Operation

Less Than Significant with Mitigation Incorporated. Permanent project structures conflicting with existing agricultural zoning or with a Williamson Act contract could cause impacts during operation. Several components of permanent project development would be in the agricultural zones A-3-G (Heavy Industrial with a Geothermal Overlay) and A-2-R-G (General Agricultural/Rural with a Geothermal Overlay). The A-3-G zone would include part of the gen-tie line and the switching station. The A-2-R-G zone would include two of the injection well pads (including the back-up injection well pad) and part of the injection pipeline.

According to the Imperial County Land Use Ordinance, the project's gen-tie line and switching station would be permitted by right within the A-3-G zoning district as "transmission lines, including supporting towers, poles microwave towers, (and) utility substations" (Imperial County 2023, Section 90509.01w). The project's injection well pads and injection pipeline would be allowed with a CUP in the A-2-R-G zoning district as "major facilities relating to the generation and transmission of electrical energy", "major geothermal projects", or "resource extraction and energy development" (Imperial County 2023, Sections 90508.02(pp), 90508.02(qq), and 90508.02(vv)).

A discussion of Imperial County's required CUP findings, and the project's consistency with these findings, can be found earlier in this Land Use section in Section 5.8.2.2(b). CEC staff determined that the project meets Imperial County's requirements for findings for issuance of a CUP. **LAND-1**, which would require the project owner to submit their final plans to Imperial County and provide the County's review comments to the CPM, would further ensure that project operation would not conflict with agricultural zoning. Therefore, with mitigation incorporated, operation of the project would not significantly conflict with existing zoning for agricultural use.

Operation of the project also would not conflict with any Williamson Act contracts. Imperial County no longer participates in the Williamson Act, and no project parcels are under a Williamson Act contract (Department of Conservation 2022).

e. Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code, section 12220(g)), timberland (as defined by Public Resources Code, section 4526), or timberland zoned Timberland Production (as defined by Government Code, section 51104(g))?

Construction

No Impact. The main project site and its offsite components are not on or near forest land, timberland, or timberland zoned Timberland Production.

Operation

No Impact. The main project site and its offsite components are not on or near forest land, timberland, or timberland zoned Timberland Production.

f. Would the project result in the loss of forest land or conversion of forest land to non-forest use?

Construction

No Impact. The main project site and its offsite components are not on or near forest land.

Operation

No Impact. The main project site and its offsite components are not on or near forest land.

g. Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

Construction

No Impact: Construction of the project would not induce growth or cause any other changes in the existing environment which could result in conversion of Farmland to non-agricultural use. There is no forest land in the area.

Operation

No Impact. The project would not induce growth which could result in the conversion of agricultural land, as it is not a new residential development or other type of development which would spur development of new services or roads. The project would also not produce any nuisances to or require operational changes to nearby agricultural operations. There is no forest land in the area.

5.8.2.3 Cumulative Impacts

Less Than Significant with Mitigation Incorporated. Many of the pending cumulative projects in the vicinity of the MBGP site, listed in **Section 1 Executive Summary**, **Table 1-2** and shown on **Figure 1**, are on or partially on Important Farmlands. These projects include the ENGP, the BRGP, the Midway IV solar project, the Nider solar project, and the Wilkinson Solar Farm (Calipal Solar Farm I).

There would be a cumulative impact due to conversion of Important Farmlands from the additive effects of these projects and the MBGP. **LAND-3**, which would mitigate impacts from the MBGP's conversion of Important Farmlands, and the mitigation measures likely imposed on these other projects in accordance with the Final Programmatic Environmental Impact Report for the Imperial County Renewable Energy and Transmission Element Update, would be expected to mitigate cumulative impacts due to conversion of Important Farmland to less than significant.

5.8.3 Project Conformance with Applicable LORS

Table 5.8-1 details staff's determination of conformance with applicable LORS, including any proposed conditions of certification (COCs), where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific COCs, the proposed project would be consistent with all applicable LORS. The subsection below, "Proposed Conditions of Certification," contains the full text of the referenced COCs.

TABLE 5.8-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
Local	
Imperial County General Plan	
Agricultural Element (Imperial County 2015a):	
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. Objective 1.1: Maintain existing agricultural land uses outside of urbanizing areas and allow only those land uses in agricultural areas that are compatible with agricultural activities. Objective 1.3: Conserve Important Farmland for continued farm-related (non-urban) use and development while ensuring its proper management and use. Objective 1.4: Discourage the location of development adjacent to productive agricultural lands. Objective 1.5: Direct development to less valuable farmland (i.e., Unique Farmland and Farmland of Local Importance rather than Prime Farmland or Farmland of Statewide Importance) when conversion of agricultural land is justified.	**Yes.** The only parts of the project on Important Farmland are the switching station (shared with the Elmore North Geothermal Project and the Black Rock Geothermal Project) and a small portion of the gen-tie line. The project sites' zoning designations allow for the geothermal project and its components with a CUP. The project sites have zoning overlays of either "Geothermal" or "Renewable Energy", meaning that Imperial County has found these areas suitable for geothermal development, and that geothermal development can be compatible with nearby agricultural activities. The Imperial County General Plan also has a Renewable Energy and Transmission Element which supports geothermal and other forms of renewable energy development (Imperial County 2015c). **LAND-3** would aid conservation of Important Farmlands in Imperial County.
Objective 1.8: Allow conversion of agricultural land to non-agricultural uses including renewable energy only when a clear and immediate need can be demonstrated, based on economic benefits, population projections and lack of other available land (including land within incorporated cities) for such non-agricultural uses. Such conversion shall also be allowed only where such uses have been identified for non-agricultural use in a city general plan or the County General Plan and are supported by a study to show a lack of alternative sites.	**Yes.** The State of California has mandates to increase the use of renewable energy in the state. Large-scale renewable energy often needs large land areas only available in rural, and sometimes agricultural, areas. In addition, geothermal plants must be in an area with an adequate geothermal source, in terms of heat flows. The applicant selected this site in part due to its location in Imperial County's KGRA. Much of Imperial County's KGRA is on agricultural lands (Imperial County 2015c, page 5, Figure 1; Department of Conservation 2020), making it difficult to avoid siting geothermal plants or their ancillary components on agricultural lands. The project sites have been identified by Imperial County as having zoning with a Geothermal Overlay or Renewable Energy Overlay, which allow the development of geothermal power plants in agricultural areas with a CUP from Imperial County (which is subsumed by the CEC's licensing process) (Imperial County 2023; Imperial County 2024). The Imperial Valley Economic Development Corporation, the Imperial Valley Workforce

TABLE 5.8-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
	Development Board, and the Imperial Valley Regional Chamber of Commerce submitted letters of support for the project, stating that the project would generate substantial economic benefits for Imperial County, both in revenue and jobs, including job training (IVEDC 2023m, ICWDB 2023l, IVRCC 2023k). No superior siting alternatives were identified during this project's Alternatives analysis. For more information about alternatives to the proposed site, see **Section 8: Alternatives** of this document.
Objective 2.6: Discourage the development of new residential or other nonagricultural areas outside of city "spheres of influence" unless designated for nonagricultural use on the County General Plan, or for necessary public facilities.	**Yes.** Although the project is not within a city "sphere of influence", it is a necessary public facility. The State of California has mandates to increase the use of renewable energy in the state, and the project area is in Imperial County's KGRA. The project sites have zoning overlays of either "Geothermal" or "Renewable Energy", meaning that Imperial County has found these areas suitable for geothermal development, and that geothermal development can be compatible with nearby agricultural activities. No superior siting alternatives were identified during this project's Alternatives analysis. For more information about alternatives to the proposed site, see **Section 8: Alternatives** of this document.
Objective 3.8: Renewable energy projects will be allowed within the RE Overlay Zone with mitigation for agricultural impacts.	**Yes.** All project components have zoning overlays of either "Geothermal" or "Renewable Energy". Proposed **LAND-3** would mitigate for the project's impacts to Important Farmland in Imperial County.
Policy 1: Agricultural land may be converted to nonagricultural uses only where a clear and immediate need can be demonstrated, such as requirements for urban housing, commercial facilities, or employment opportunities. All existing agricultural land will be preserved for irrigation agriculture, livestock production, aquaculture, and other agriculture-related uses except for non-agricultural uses identified in this General Plan or in previously adopted City General Plans. Program 1: No agricultural land designated except as provided in Exhibit C shall be removed from the Agriculture category except where needed for use by a public agency, for renewable energy purposes, where a mapping error may have occurred, or where a clear long term economic benefit to the County can be demonstrated through the planning and environmental review process. The Board (or Planning Commission) shall be required to prepare and make specific findings and circulate same for	**Yes.** The State of California has mandates to increase the use of renewable energy in the state. Large-scale renewable energy often needs large land areas only available in rural, and sometimes agricultural, areas. In addition, geothermal plants must be in an area with an adequate geothermal source, in terms of heat flows. The applicant selected this site due to its location in Imperial County's KGRA. Much of Imperial County's KGRA is on agricultural lands (Imperial County 2015c, page 5, Figure 1; Department of Conservation 2020), making it difficult to avoid siting geothermal plants on agricultural lands. The project sites have been identified by Imperial County as having zoning with a Geothermal Overlay or Renewable Energy Overlay, which allow the development of geothermal power plants in agricultural areas with a CUP from Imperial County (which is subsumed by the CEC's licensing process) (Imperial County 2023; Imperial County 2024).

TABLE 5.8-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
60 days (30 days for parcels considered under Exhibit C of this element) before granting final approval of any proposal which removes land from the Agriculture category.	The Imperial Valley Economic Development Corporation, the Imperial Valley Workforce Development Board, and the Imperial Valley Regional Chamber of Commerce submitted letters of support for the project, stating that the project would generate substantial economic benefits for Imperial County, both in revenue and jobs, including job training (IVEDC 2023m, ICWDB 2023l, IVRCC 2023k). No superior siting alternatives were identified during this project's Alternatives analysis. For more information about alternatives to the proposed site, see **Section 8: Alternatives** of this document.
Conservation and Open Space Element (Imperial County 2016)	
Objective 8.2: Focus all new renewable energy development within adopted Renewable Energy Overlay Zones.	**Yes.** All parts of the proposed project are on sites zoned with a Geothermal or Renewable Energy Overlay.
Policy (page 50): The County shall discourage urban development on State-designated important agricultural lands including Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance. Program (page 50): Continue a fee or assessment on new development which converts land presently in agricultural use. The revenue could be used to purchase development rights or fee title to other land still in production or open space, as deemed necessary.	**Yes.** As discussed earlier, the only project sites on Important Farmland are the switching station, shared with the proposed ENGP and BRGP, and a portion of the gen-tie line, which are both on Farmland of Statewide Importance. These sites have zoning overlays of either "Geothermal" or "Renewable Energy", meaning that Imperial County has found these areas suitable for geothermal development, and that geothermal development can be compatible with nearby agricultural activities. **LAND-3** would include mitigation for the impacts of converting Important Farmlands, including options such as fee payment or procuring conservation easements.
Land Use Element (Imperial County 2015b)	
Commercial Agriculture Goal 1: Preserve commercial agriculture as a prime economic force. Objective 1.1: Encourage the continued agricultural use of prime/productive agricultural lands. Objective 1.2: Discourage the location of incompatible development adjacent to or within productive agricultural lands. Objective 1.3: Identify compatible agriculture-related uses or renewable energy projects appropriate for location in agricultural areas.	**Yes.** The project site is on "Other Land", which is not a type of Important Farmland. The only permanent project components on Important Farmland are a small portion of the gen-tie line and the switching station, which would be shared with the ENGP and the BRGP. Objective 1.3 identifies renewable energy projects as an alternative to agricultural uses if the location is appropriate. All project components are on lands with a zoning overlay of Geothermal or Renewable Energy, meaning that Imperial County designated them as suitable sites for renewable energy and generally compatible with nearby agricultural uses.
Economic Growth Goal 2: Diversify employment and economic opportunities in the County while preserving agricultural activity.	**Yes.** The project would provide new employment opportunities in the region and would provide revenue to Imperial County.

TABLE 5.8-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
Objective 3.15 Support the safe and orderly development of renewable energy in conformance with the goals and objectives of the Renewable Energy and Transmission Element.	**Yes.** The project is consistent with the goals and objectives of the Renewable Energy and Transmission Element, as discussed below.
Industrial development standards for Agriculture land use designation on page 49: Renewable Energy projects may be permitted with an appropriate Conditional Use Permit subject to zoning and environmental review. Maximum floor area ratio not greater than 1:1 (i.e., 1 square foot of gross building area per 1 square foot of area within the lot or building site). Building height maximum of 50 feet. A lesser height may be required by the Airport Land Use Compatibility Plan.	**Yes.** The project site and its ancillary components have zoning overlays of Geothermal or Renewable Energy, which allow geothermal projects (a type of renewable energy project) with a CUP. Staff determined that the project would meet the required findings for a CUP, as discussed earlier in Section 5.8.1(b) of this section. The floor area ratio of the project is far less than the maximum of 1:1, given that the project is on approximately 51 acres of a 160-acre parcel, and that enclosed structures would be approximately 10,000 square feet (Jacobs 2023a, pages 1-1 and 5.10-15). The proposed project's maximum building height at the project site is approximately 95 feet in height. This exceeds the General Plan's building height maximum of 50 feet for industrial development in the Agriculture land use designation. However, the project site has a Geothermal zoning overlay, which allows geothermal projects with a CUP, and it is not feasible for the project's AFTs to be built to a lower height. Zoning regulations generally have more detailed development standards and allowed uses than the General Plan, so staff considers the project to be consistent with LORS due to its consistency with zoning and with the findings needed to issue a Variance for height requirements.
Renewable Energy and Transmission Element (Imperial County 2015c)	
Objective 1.2: Lessen impacts of site and design production facilities on agricultural, natural, and cultural resources. Objective 2.2: Where practicable and cost-effective, design transmission lines to minimize impacts on agricultural, natural, and cultural resources, urban areas, military operation areas, and recreational activities.	**Yes.** Wherever possible, the project's production and injection pipelines would be placed next to the borders of fields or along access roads to minimize the amount of land affected. The project's gen-tie line would be immediately adjacent to existing Imperial County road ROWs where possible to minimize land affected (Jacobs 2023a, page 2-45).
Goal 6 – Support development of renewable energy while providing for the protection of military aviation and operations. Objective 6.1: Assure that renewable energy facilities proposed in areas adjacent to military installations and training areas will be compatible with these uses. Objective 6.2: Facilitate the early exchange of project-related information with the military for	**In Process- Undetermined** The applicant has notified the military of the project through the Department of Defense (DoD) Clearinghouse (Jacobs 2024i). The DoD responded in a letter dated April 4th, 2024, stating that the proposed siting location of the geothermal project may impact United States Marine Corps low-level flight traffic in Special Use Airspace, and requesting that the applicant contact a DoD staff member to discuss the project. The applicant has contacted the

TABLE 5.8-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
proposed renewable energy facilities within a military operations area (MOA) or within 1,000 feet of a military installation. Objective 6.3: Assure that renewable energy facilities proposed within MOAs will not jeopardize the safety of existing residents or impact military operations.	DoD staff member and is currently awaiting a response (Jacobs 2024r).
Imperial County Land Use Ordinance (Imperial County 2023)	
The Imperial County Land Use Ordinance includes discussion of allowed uses and development standards for parcels in various zoning districts, including minimum side, front, and rear setbacks, and maximum height (Imperial County 2023).	**Yes.** The project components are allowed in their respective zoning districts with a CUP. Staff determined that Imperial County's required findings for a CUP can be made. See the discussion below in the next row, and earlier in this Land Use section in subsection 5.8.2.2(b). The primary plant facility also would meet the development standards of the S-1-G zoning district with a Variance for the project's height. Building setbacks would meet the required minimums of 25 feet for the front yard, 10 feet for the side yards, and 10 feet for the rear yards, as established by Section 90518.06 of the Imperial County Land Use Ordinance. However, the project's building height of 95 feet would exceed the maximum structural height of 35 feet, as established in Section 90518.07 of the Imperial County Land Use Ordinance (although communication towers can be up to 100 feet without a Variance). The project would meet Imperial County's required findings for a Variance, as discussed earlier in subsection 5.8.2.2(b). To ensure that project development would comply with the applicable zoning district, staff has proposed **LAND-1**. **LAND-1** would require the project owner to submit final site plans to Imperial County for review and comment for permanent structures under CEC jurisdiction, and to obtain CUPs from Imperial County for the project components under their jurisdiction.
Section 90203.09: An application for a Conditional Use Permit shall be reviewed, and approved, conditionally approved, or denied by the decision-making authority. The authority may approve or conditionally approve an application only if it finds all of the following: A. The proposed use is consistent with the goals and policies of the adopted County General Plan. B. The proposed use is consistent with the purpose of the zone or sub-zone within which the use will be located.	**Yes.** The project is consistent with the required CUP findings as discussed in subsection 5.8.2.2(b) above. To ensure that the project would comply with Imperial County's regulations, **LAND-1** would require the project owner to submit final site plans to Imperial County for review and comment for permanent structures under CEC jurisdiction, and to obtain CUPs from Imperial County for the project components under their jurisdiction.

TABLE 5.8-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
C. The proposed use is listed as a use within the zone or sub-zone or is found to be similar to a listed conditional use according to the procedures of Section 90203.10. D. The proposed use meets the minimum requirements of this Title applicable to the use and complies with all applicable laws, ordinances and regulations of the County of Imperial and the State of California. E. The proposed use will not be detrimental to the health, safety, and welfare of the public or to the property and residents in the vicinity. F. The proposed use does not violate any other law or ordinance. G. The proposed use is not granting a special privilege. The decision-making authority shall deny an application if it cannot make all of the above findings.	
Section 91703.04: A. Major Geothermal Projects may be permitted in the Renewable Energy Overlay Zone only through the issuance of a Conditional Use Permit (CUP).	**Yes.** Staff has determined that the project is consistent with required CUP findings. See above row.

5.8.4 Conclusions and Recommendations

As discussed above, with implementation of the proposed COCs, the project would have a less than significant impact related to land use, agriculture and forestry and would conform with applicable LORS. Until staff receives project review comments from DoD, the project's conformance with Goal 6 of the Imperial County General Plan, "Support development of renewable energy while providing for the protection of military aviation and operations", is undetermined.

Staff recommends adopting the COCs as detailed in subsection "5.8.5 Proposed Conditions of Certification" below.

5.8.5 Proposed Conditions of Certification

The following proposed COCs include measures to both mitigate environmental impacts and ensure conformance with applicable LORS. The COCs below are enforceable as part of the CEC's certificate for the portions of the project constituting the site and related facilities (power plant, gen-tie line to the first point of interconnect, water supply pipeline, and production and injection conveyance pipelines connecting directly to the power plant).

Additional impacts associated with project components outside of the CEC's jurisdiction, such as the well complex licensed by CalGEM and permitted by Imperial County, the temporary structures such as the construction camps, laydown/parking yards, and borrow pits to be permitted by Imperial County, and the switching station to be permitted by IID, require mitigation by other licensing jurisdictions to be less than significant. This CEQA analysis evaluates impacts resulting from all aspects of the project, and for the entire project to have less than significant impacts, the mitigation actions by other licensing jurisdictions described in these COCs would need to be implemented as mitigation measures (MMs). For this reason, some COCs are titled COC/MM.

For purposes of the facility certification issued by the CEC, the project owner must comply with the following COCs on the jurisdictional site and related facilities as delineated in **Section 3 Project Description**. Verifications set forth below only apply to the COCs, not the MMs.

COC LAND-1/MM LAND-1 Prior to development of any temporary construction camps, laydown and parking areas, and borrow pits for project construction activities, and prior to any development of wells, or of production or injection pipelines not connecting directly with the geothermal plant, the project owner shall provide copies of the required permits issued by the Imperial County Planning & Development Services Department to ensure compliance with local regulations. The project owner shall also provide copies of the necessary permits issued by CalGEM for wells and for the production and injection pipelines not connecting directly with the geothermal plant.

Prior to the development of the switching station, the project owner shall provide verification of its approval by the Imperial Irrigation District.

Prior to any grading or development for the permanent project facilities under CEC jurisdiction (the geothermal plant, gen-tie line, water supply line, and production and injection lines connecting directly with the geothermal plant), the project owner shall develop a site plan and submit it to the Imperial County Planning & Development Services Department for comment to ensure compliance with local regulations.

The project owner shall ensure that local regulations are complied with during construction, operation, and restoration of the temporary construction camps, laydown and parking areas, and borrow pits. The project owner shall also ensure that local regulations are complied with during construction and operation of the permanent project facilities.

Verification: At least 30 days prior to development of any temporary construction camps, laydown and parking areas, and borrow pits for project construction activities, and prior to any development of wells, or of production and injection pipelines not connecting directly with the geothermal plant, the project owner shall provide to the CPM the required approved permits from the Imperial County

Planning & Development Services Department. The project owner shall also provide to the CPM the necessary permits from CalGEM for the wells and for the production and injection pipelines not connecting directly with the geothermal plant.

At least 30 days prior to any grading or development for the switching station, the project owner shall provide verification of IID approval.

At least 60 days prior to any grading or development for permanent project facilities under CEC jurisdiction (the geothermal plant, gen-tie line, water supply line, and production and injection lines connecting directly with the geothermal plant) the project owner shall submit proposed site plans for these facilities to the Imperial County Planning & Development Services Department. The project owner shall provide the site plans to the CPM for review and approval, along with any review comments from Imperial County, at least 30 days prior to any grading or development for these permanent project facilities. Note that plan submittals to Imperial County should meet the requirements in Section 91701.04(A), "New Project Application Requirements", of the Imperial County Land Use Ordinance.

COC LAND-2 Obtain an encroachment permit or encroachment agreement from the Imperial Irrigation District (IID) for any construction or operation of project linears under jurisdiction of the CEC (water supply pipeline, gen-tie line to the first point of interconnect) on IID property or within its existing or proposed right-of-way or easements. Construction or operation activities which would require an encroachment permit or encroachment agreement from IID include but are not limited to: surface improvements, such as proposed new streets, driveways, parking lots, and landscaping; and all water, sewer, stormwater, or any other aboveground or underground utilities. No foundations or buildings are allowed within IID's right-of-way.

Verification: At least 60 days prior to any potential encroachment on IID property or IID's existing or proposed right-of-way, the project owner shall apply to IID for an encroachment permit or encroachment agreement. 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#:~:text=IID%27s%20real%20estate%20section%20maintains,water%20rights%20and%20water%20availability.

The project owner shall submit a copy of IID's permit and/or comments to the CPM within 30 days of the potential encroachment.

COC LAND-3/MM LAND-3 The project owner shall implement one of the following three options to mitigate for agricultural land conversion of Farmland of Statewide Importance (including the transmission line and switching station). These options

are based on Imperial County's Mitigation Monitoring and Reporting Program in the Final Programmatic Environmental Impact Report for the Imperial County Renewable Energy and Transmission Element Update.

For Non-Prime Farmland (such as Farmland of Statewide Importance):

Option 1: The project owner shall procure Agricultural Conservation Easements on a "one-to-one" basis on land of equal size, of at least equal quality of farmland, outside the development footprint. The Conservation Easement shall meet the State Department of Conservation's regulations and shall be recorded prior to any project grading or building.

Option 2: The project owner shall pay an "Agricultural In-Lieu Mitigation Fee" in the amount of 20 percent of the fair market value per acre for the total acres of proposed site based on five comparable sales of land used for agricultural purposes as of the effective date of the permit, including program costs on a cost recovery/time and material basis. The Agricultural In-Lieu Mitigation Fee will be placed in a trust account administered by the Imperial County Agricultural Commissioner's office and will be used for such purposes as the acquisition, stewardship, preservation, and enhancement of agricultural lands within Imperial County.

Option 3: The project owner and County shall voluntarily enter into an enforceable Public Benefit Agreement or Development Agreement that includes an Agricultural Benefit Fee payment that is: (1) is consistent with Board Resolution 2012-005; and (2) the Agricultural Benefit Fee must be held by the County in a restricted account to be used by the County only for such purposes as the stewardship, preservation, and enhancement of agricultural lands within Imperial County and to implement the goals and objectives of the Agricultural Benefit program, as specified in the Development Agreement, including addressing the mitigation of agricultural job loss on the local economy.

Verification: At least 60 days prior to any project grading or building, the project owner shall provide documentation to the CPM verifying implementation of the selected option(s) and acceptance by Imperial County. The project owner shall provide details to the CPM regarding how the options were implemented.

COC LAND-4/MM LAND-4 The project owner shall develop and implement a restoration plan which includes stockpiling excavated topsoil and using it to restore the original conditions as closely as possible at sites of temporary construction activity, such as laydown and parking areas, construction camp areas, borrow sites, and any work areas.

Verification: At least 60 days prior to any project grading, the project owner shall submit a stockpiling and restoration plan to the CPM for review.

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5.9 Noise and Vibration

Kenneth Salyphone

5.9.1 Environmental Setting

The Morton Bay Geothermal Project (MBGP or project) area consists primarily of heavy industrial (MH) land uses. The proposed project would be on an approximately 51-acre portion of a 160-acre parcel. The project is adjacent to Davis Road and Schrimpf Road in Imperial County. There are several geothermal plants within one and a half miles of MBGP. The nearest human receptors are the Red Hill Marina Park campsite (RHMP), approximately one and a half miles west of the project site, and the Sonny Bono National Wildlife Refuge (SBR), which is a non-residential land use that temporarily house employees, approximately two and a half miles southwest of the project site. The nearest residence is over three and a half miles east of the project site, on the corner of Schrimpf Road and State Route 111, referred to as Residence One (R-1) in this staff assessment.

Both short- and long-term noise monitoring surveys were conducted within a five-mile radius of the project boundaries. The predominant ambient noise sources are attributed to the existing geothermal projects in the area.

Regulatory

Federal

Occupational Safety and Health Act (OSHA). The Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (Title 29, Code of Federal Regulations, Section 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise exposure levels as a function of the amount of time during which the worker is exposed. The regulations further specify a hearing conservation program that involves monitoring the noise to which workers are exposed, assuring that workers are made aware of overexposure to noise, and periodically testing the workers' hearing to detect any degradation.

State

Cal-OSHA. Cal-OSHA has promulgated Occupational Noise Exposure Regulations (California Code of Regulations, Title 8, Sections 5095-5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards.

Local

Imperial County Noise Element. Imperial County's General Plan Noise Element sets noise control standards. The Noise Element defines "sensitive receptors" to include residences, schools, hospitals, parks and office buildings (Imperial County 2015, Section IV.C.2, Interior Noise Standard), summarized below:

Imperial County General Plan Property Line Noise Limits

Zone	Time	1-hour Average Sound Level, dBA
Residential	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
Multi-Residential	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
Commercial	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
Light Industrial and Industrial Park	Anytime	70
General Industrial	Anytime	75

Source: Imperial County 2015, Table 9

The Noise Element further states that construction noise, from a single piece of equipment or a combination of equipment, shall not exceed 75 dBA L_{eq} at the nearest sensitive receptor, averaged over eight hours. Construction equipment operation shall be limited to the following hours (Imperial County 2015, Section IV.C.3, Construction Nosie Standards):

- Monday through Friday 7 a.m. to 7 p.m.
- Saturday 9 a.m. to 5 p.m.
- Sunday and Holidays Not allowed

If the noise level at a receptor is within the "normally acceptable" range of the Noise/Land Use Compatibility Guidelines cited in Table 7 of the Noise Element (Imperial County 2015, Section IV.C.1), and the project has increased the ambient noise levels at that receptor by five dBA CNEL or more, then the project is deemed to have created a potentially significant noise impact, and mitigation measures must be considered. If the noise level at a receptor, is above the "normally acceptable" range of the Noise/Land Use Compatibility Guidelines, and the project has increased the ambient noise levels at the receptor by three dBA CNEL or more, then the project is also deemed to have created a potentially significant noise impact, and mitigation measures must be considered (Imperial County 2015, Section IV.4).

Imperial County Renewable Energy & Transmission Element/Ordinance. Title 9 Division 17 section 91703.01 sets limits on drilling noise from geothermal facilities. The maximum continuous noise level, measured at the nearest human receptor outside the parcel boundary or one-half mile from the sound (whichever is greater), may not exceed 65 dBA CNEL. Further, specific limits are established for noise from geothermal well drilling operations. These limits can be summarized thus (Imperial County 2017):

- Drilling noise must be limited to 65 dBA CNEL, measured as described above.
- Diesel-driven drilling equipment operated within 300 feet of any residence must have hospital-type mufflers, and well-venting and testing equipment used in such locations must include an effective silencer.
- All drilling preparation work, including racking and/or making up drill pipes, must be done between 7 a.m. and 7 p.m. if within 300 feet of any residence.
- Impulsive noises, such as sudden steam venting, must be controlled by a muffler or other sound attenuating system.

If the above requirements are met, drilling may continue 24 hours per day.

Imperial County Noise Abatement and Control Ordinance. The County's Noise Ordinance (Imperial County 2017a) establishes sound level limits, as summarized below:

Imperial County Noise Ordinance Sound Level Limits

Zone	Time of Day	Hourly Limit, dB L_{eq}
Single Family Residential (R-1)	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
All Other Residential	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
Commercial	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
Manufacturing, Industrial, Agricultural & Extraction	Anytime	70
General Industrial	Anytime	75

Source: Imperial County 2017a, Section 90702.00 A

Cumulative

Section 15130 of the California Environmental Quality Act (CEQA) Guidelines (California Code of Regulations, Title 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The CEQA Guidelines require that the discussion reflect the severity of the impacts and the likelihood of their occurrence but need not provide as much detail as the discussion of the impacts attributable to the project alone.

Pursuant to CEQA, a cumulative impacts analysis can be performed by either 1) summarizing growth projections in an adopted general plan or in a prior certified

environmental document, or 2) compiling a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this Staff Assessment.

Staff has identified the projects listed below as contributors to cumulative noise impacts on SBR and R-1:

- Black Rock Geothermal Project (Proposed)
- Morton Bay Geothermal Project (Proposed)
- Elmore Geothermal Project (Existing)
- Cal Energy Generation (Existing)
- Vulcan Power Plant (Existing)
- Hudson Ranch Power Plant (Existing)

Cumulative noise impacts are determined by the noise levels of two or more noise sources at a receptor. Adding two noise sources at a receptor would create a maximum noise level increase of three dBA above the loudest noise source.

5.9.2 Environmental Impacts

NOISE AND VIBRATION	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b. Would the project result in 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?	☐	☐	☒	☐

Environmental checklist established by CEQA Guidelines, Appendix G- noise.

5.9.2.1 Methodology and Thresholds of Significance

The construction and operation of any power plant creates noise, or undesired sound. The character and loudness of this noise, the times of day or night that it occurs, and the

proximity of the facility to sensitive receptors (humans) combine to determine whether the facility would meet applicable noise control laws and ordinances, and whether it would cause significant adverse environmental impacts.

In addition, vibration may be produced as a result of power plant construction practices, such as blasting or pile driving. The ground-borne energy of vibration has the potential to cause structural damage and annoyance.

Methodology

CEQA Guidelines state that a project would normally be considered to have a significant impact if noise levels conflict with adopted environmental standards or plans (County's noise level threshold), or if noise levels generated by the project would substantially increase existing ambient noise levels at noise-sensitive receivers on a permanent or temporary basis.

Thresholds of Significance

Generally, an increase of three dBA is noticeable and an increase of five dBA is distinct. Other factors, such as the frequency of occurrence of the noise and time of day/night it occurs, are also commonly considered in determining if such an increase is clearly significant or not.

There are no adopted thresholds for an increase in dBA level to be considered a significant impact for construction activities. Noise due to construction activities are considered to be less than significant if the construction activity is temporary and the use of heavy equipment and noisy activities is limited to daytime hours. However, an increase of 10 dBA or more during the day can be perceived as noisy (triggering a community reaction) and warrant additional measures to address the noise levels. An increase of 10 dBA corresponds to a doubling of loudness or dBA level and is generally considered to be the starting point at which significant noise impacts may occur (triggering a community reaction). It is very difficult to identify the exact level of noise resulting from construction because it fluctuates based on many factors over the course of a week, day, or even hour. It also depends on other factors, such as intervening structures, land topography and land cover. For example, intervening structures block or impede sound waves, and undulating topography and land roughness would play a role in attenuating the propagation of noise waves. Therefore, performance standards (i.e., a complaint and redress process) are ultimately used as a backstop measure to address any impacts that are perceived by the community.

Imperial County's General Plan Noise Element, Renewable Energy & Transmission Ordinance, and Noise Ordinance establishes noise level thresholds for various land uses and noise limitations for the construction and operation of geothermal projects.

In September 2013, the California Department of Transportation (Caltrans) released the Transportation and Construction Vibration Guidance Manual. This manual includes the Federal Transit Administration's methods and findings. The Caltrans manual states that

for construction activities that generate vibration, the threshold of human response begins at a peak particle velocity (PPV) of 0.16 inch per second (in/sec). This is characterized by Caltrans as a "distinctly perceptible" event with an incident range of transient to continuous (Caltrans 2013). A level of 0.20 in/sec has been found to be annoying to people in buildings and can pose a risk of architectural damage to buildings.

5.9.2.2 Direct and Indirect Impacts

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

Construction

Less Than Significant Impact with Mitigation. The County's General Plan Noise Element does not establish noise level thresholds at adjacent property lines during construction activities. However, Section IV.C.3 of the Noise Element establishes a noise level threshold for a single piece or combination of construction equipment—noise levels from the equipment shall not exceed 75 dBA L_{eq} averaged over and eight-hour period at the nearest sensitive receptor. Also, construction equipment operations would be limited to the hours of 7:00 A.M. to 7:00 P.M., Monday through Friday, and 9:00 A.M. to 6:00 P.M., Saturday. No commercial construction operations are permitted Sunday or holidays (Imperial County 2015). In addition to the General Plan, the County's Renewable Energy & Transmission Ordinance (Imperial County 2017, Section 91703.01) sets limits on drilling noise from geothermal facilities. The maximum continuous noise level, measured at the nearest human receptor outside the parcel boundary or one-half mile from the sound (whichever is greater), may not exceed 65 dBA CNEL.

Demolition and construction activities for the project would occur in five phases (demolition/site clearing, concrete pouring, steel erection, mechanical, and cleanup) and take approximately 29 months to complete. Each phase uses a combination of construction equipment. The noise level from each phase is between 78 and 89 dBA L_{eq} at 50 feet. Demolition and site cleanup phases generate the highest noise level of 89 dBA L_{eq} at 50 feet.

At RMHP, approximately one and a half miles from the project site, the daytime ambient noise level is 50 dBA L_{eq}. At this location, the noise levels from the loudest construction phase would be 45 dBA. This is below the ambient noise levels and would be below the County's noise level threshold for combination of construction equipment.

At SBR, approximately two and a half miles from the project site, the daytime ambient noise level is 43 dBA L_{eq}. At this location, the noise levels from demolition/site clearing and site cleanup phases would be 40 dBA $L_{eq.}$ This is below the ambient noise levels and would be below the County's noise level threshold for combination of construction equipment.

R-1 would be over three and a half miles away from the project, too far away to be affected by the noise levels from project's demolition and construction. In addition, the noise levels would be below the County's noise threshold for combined construction equipment. Thus, noise levels from the project's construction phases would be less than significant.

Demolition and construction activities would utilize a single piece of equipment that could generate noise levels that exceed ambient noise, such as jackhammers and pile drivers. Equipment used for the project during demolition and construction activities produces noise levels between 73 dBA L_{eq} (i.e., jackhammers) and 104 dBA L_{eq} (pile driving) at 50 feet, if unsilenced. Drilling would be utilized during construction of the extraction/injection wells and would produce a noise level of 83 dBA L_{eq} at 50 feet. Steam blow (steam venting) would occur during the power plant's commissioning activities and would generate infrequent and temporary noise.

The project's demolition activities would include site grading (cut and fill) to match the surrounding elevation. The demolition and construction activities would include drilling and debris removal, and construction activities would also include pile driving, new foundations, structures, and equipment installation.

Typically, pile driving is infrequent and of short duration. Pile driving noise is intermittent and not continuous throughout the day. For MBGP, it would occur 3 to 4 days a month for four consecutive months. Unsilenced pile driving would generate the highest noise level for a single piece of construction equipment—104 dBA L_{eq} at 50 feet. R-1 would be over three and a half miles away from the project, too far away to be affected by pile driving noise. At RHMP, noise levels from pile driving would be 60 dBA L_{eq}, 10 dBA above the ambient level of 50 dBA L_{eq} at this receptor. Noise levels from pile driving would be 55 dBA L_{eq} at SBR, 12 dBA above the ambient level of 43 dBA L_{eq} at this receptor.

Staff proposes conditions of certification (COCs) **NOISE-8** to ensure noise from pile driving would not significantly increase the existing ambient noise levels at RHMP and SBR. As outlined in **NOISE-8**, this can be achieved by implementing several best management methods that are available for reducing noise and vibration generated by traditional pile driving. These methods include: (1) the use of pads or impact cushions of plywood; (2) dampened driving, which involves some form of blanket or enclosure around the hammer; and (3) the use of vibratory drivers or hydraulic pile pushers instead of impact drivers.

As mentioned above, steam blow would occur during power plant commissioning. Steam blow is effective at cleaning out accumulated dirt, rust, scale, and debris from the steam system. Cleaning the steam system prevents accelerated steam turbine failures. However, steam blow does generate noise. Unsilenced steam blow could generate noise levels by up to 104 dBA L_{eq} at 50 feet. This could increase the existing ambient noise levels at RHMP by approximately 10 dBA and 12 dBA at SBR. With the use of a rock muffler or other forms of silencers, staff anticipates that steam blow noise would not distinctly increase the daytime ambient levels at RHMP and SBR. Thus, the impact would be less

than significant with mitigation. R-1 would be over three and a half miles away from the project, too far away to be affected by steam blow noise.

Staff proposes **NOISE-7** to limit noise from steam blows by requiring the use of a rock muffler or other forms of effective silencers, and to implement a notification process to inform RHMP and SBR of the impending steam blows.

Furthermore, to address additional noise impacts that might be perceived noisy by the community, staff proposes **NOISE-1** through **NOISE-3, NOISE-5, and NOISE-6**. These COCs would provide the public with notification of construction, noise complaint and redress process (**NOISE-1** and **NOISE-2**), would require construction workers and employees use noise protection (**NOISE-3** and **NOISE-5**), and would place restriction on demolition and construction activities (**NOISE-6**).

With implementation of **NOISE-1** through **NOISE-3**, **NOISE-5** through **NOISE-8**, project demolition and construction activities would not result in generation of a substantial increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies, and would not create a significant adverse noise impact.

Operation

Less Than Significant Impact. The proposed project and its linear facilities would consist of the geothermal production and generation facilities, including transmission lines and switchyard, cooling towers, and triple pressure steam turbine generator with condenser.

The County's Renewable Energy & Transmission Element/Ordinance Title 9, Division 17, Section 91702.00 I, establishes a noise threshold for all renewable energy facilities of 70 dBA CNEL, or 63 dBA L_{eq}, at the nearest human receptor outside the project boundary or one-half mile from the sound, whichever is greater. The County's General Plan Noise Element includes goals to minimize operational noise impacts from existing and new industrial and commercial development to protect sensitive land uses from noise intrusions. The County's Noise Ordinance (Title 9, Division 7, Section 90702.00 A) establishes noise level thresholds for industrial, commercial, and residential land uses. No noise-sensitive receptor is within one-half mile of the project site or adjacent to the project boundary.

The project's operational noise levels would be 70 dBA L_{eq} at 200 feet, assuming day-to-day operating conditions, including all equipment necessary to generate and transmit electricity to the grid.

At RHMP, the project's operational noise levels would be approximately 38 dBA L_{eq}. This would be below the daytime ambient noise level (50 dBA) and the County's daytime threshold (60 dBA).

At SBR, the project's operational noise level would be approximately 34 dBA L_{eq}. At this receptor, the daytime ambient noise level is 43 dBA L_{eq} and the County's daytime

threshold is 60 dBA L_{eq}. Operational noise levels would not increase the ambient noise level at this receptor and would be below the County's noise threshold.

At R-1, the project's operational noise level would be approximately 31 dBA L_{eq}. The daytime and nighttime ambient noise level at this location is 43 and 39 dBA L_{eq}, respectively. The County's daytime and nighttime noise thresholds for residential land use are 50 and 45 dBA L_{eq}, respectively. Therefore, the operational noise level at R-1 would be below both the ambient noise levels and County's noise thresholds.

Furthermore, staff proposes **NOISE-4** to ensure the project would not increase the ambient noise levels at RHMP and SBR would comply with the County's noise thresholds. **NOISE-4** would ensure measurement and verification that operational noise performance criteria are met at the project's noise sensitive receptors.

With implementation of **NOISE-4** project operations would not result in generation of a substantial increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies and would not create a significant adverse noise impact.

b. Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

Construction

Less Than Significant Impact. Pile driving would generate the most project construction vibration. This analysis relies on the vibration thresholds identified by Caltrans to determine the significance of vibration impacts related to adverse human reactions. The threshold of human response begins at a PPV of 0.16 in/sec. Caltrans characterizes this as a "distinctly perceptible" event (Caltrans 2013). A level of 0.20 in/sec has been found to be annoying to people in buildings and can pose a risk of architectural damage to buildings.

Jackhammers can cause a groundborne vibration rate of 0.035 in/sec at 25 feet (less than the threshold of human response), and pile drivers can cause a groundborne vibration of 0.65 in/sec at 25 feet (Caltrans 2013). However, vibration rates dissipate rapidly with distance. At 100 feet, the vibration would be less than 0.16 in/sec and therefore not distinctly perceptible. There are no sensitive receptors or structures within this distance of the project site boundary. Therefore, temporary vibration impacts from construction equipment are expected to be less than significant.

Operation

Less Than Significant Impact. Sources of groundborne vibration associated with project operation would include the steam turbine, and various pumps. These pieces of equipment would be well-balanced, as they are designed to produce very low vibration levels (less than the threshold of human response) throughout the life of a project. In most cases, even when there is an imbalance, they could contribute to ground vibration

levels only in the vicinity of the equipment and would be dampened within a short distance. Furthermore, vibration monitoring systems would be installed to ensure the equipment remains balanced (Jacobs 2023a, Section 5.7.3.3.5). An imbalance would prompt a system equipment shut down. Therefore, vibration impacts due to project operation would be less than significant.

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

Construction and Operation

Less Than Significant Impact. The nearest airport to the project site is the Imperial County Airport, approximately 23 miles northwest. The project's operational noise levels would not exceed the 24-hour ambient noise levels at the nearest residential receptors. The project site is surrounded by mostly agricultural and industrial uses, and the closest residence is about three and a half miles away from the project site and more than 20 miles away from the airport. Thus, the project would not combine with the airport to expose people to excessive noise levels.

5.9.2.3 Cumulative Impacts

As mentioned in the Cumulative Setting, cumulative noise impacts are determined by the noise levels of two or more noise sources at a receptor. The receptors for the project would be SBR and RHMP (R-1 would be too far away). The potential contributors to cumulative noise impacts at these receptors would be:

- Elmore North Geothermal Project (Proposed)
- Elmore Geothermal Project (Existing)
- Cal Energy Generation (Existing)
- Vulcan Power Plant (Existing)
- Hudson Ranch Power Plant (Existing)

The cumulative noise impact analysis includes noise levels from construction and operation for the proposed project and contributing projects listed above.

Construction

Less Than Significant Impact with Mitigation Incorporated. The only project listed above that may result in a cumulative noise impact when combined with MBGP, is the proposed Elmore North Geothermal Project (ENGP). Black Rock Geothermal Project (BRGP) would be too far away from the project's noise sensitive receptors to be included in this cumulative noise impact assessment. The rest of the projects listed above have already

been accounted for in the existing ambient noise levels at the project's noise sensitive receptors.

Demolition and construction activities for MBGP and ENGP would take approximately 29 months to complete. These construction activities would overlap.

The cumulative noise level from MBGP and ENGP's loudest construction phases would not increase the daytime ambient noise level at RHMP.[1]

The cumulative noise level from MBGP and ENGP's loudest construction phases would increase the daytime ambient noise level at SBR, by approximately 7 dBA.[2]

MBGP and ENGP would both involve pile driving and steam blow activities. Pile driving would occur during the construction phase. For the three projects, pile driving activities are expected to overlap for four months. Steam blows would occur during power plant commissioning and may occur at the same time for all the projects. It is unclear if pile driving, or steam blows would occur for both projects on the same days and times of day. This analysis, however, assumes that all three projects would perform pile driving and steam blows on the same days and times of day during their respective phases.

The cumulative noise level from MBGP and ENGP's pile driving could increase the daytime ambient noise level at RHMP by approximately 20 dBA.[3]

The cumulative noise level from MBGP and ENGP's pile driving could increase the daytime ambient noise level at SBR by approximately 21 dBA.[4]

As mentioned above, staff proposes **NOISE-8** to ensure noise from pile driving would not significantly increase the existing ambient noise levels at RHMP and SBR, and businesses in the vicinity of the project site.

1 Cumulative construction noise calculations at RMHP: MBGP would not increase ambient noise (45 dBA noise level is less than 50 dBA ambient). ENGP would not increase ambient noise (45 dBA noise level is less than 50 dBA ambient).

2 Cumulative construction noise calculations at SBR: Noise from MBGP would not increase the ambient noise level. Noise from ENGP would increase the ambient noise by up to 7 dBA. Resulting in a cumulative increase of approximately 7 dBA.

3 Cumulative pile driving noise calculations at RHMP: MBGP would increase ambient noise approximately 10 dBA. ENGP would increase ambient noise approximately 20 dBA. Resulting in a cumulative increase of approximately 20 dBA over the ambient.

4 Cumulative pile driving noise calculations at SBR: MBGP would increase ambient noise approximately 12 dBA. ENGP would increase ambient noise approximately 20 dBA. Resulting in a cumulative increase of approximately 21 dBA over the ambient.

At RHMP, unsilenced steam blow from MBGP and ENGP could increase the ambient noise level by approximately 20 dBA.[5]

At SBR, unsilenced steam blow from MBGP and ENGP could increase the existing ambient noise level by approximately 21 dBA.[6]

With the projects' proposed use of a rock muffler or other forms of silencers, staff anticipates that steam blow noise would not distinctly increase the daytime ambient levels at RHMP and SBR. Thus, the impact would be less than significant with mitigation.

As mentioned above staff proposes **NOISE-7** to ensure noise from steam blow would not significantly increase the existing ambient noise levels at RHMP, SBR, and businesses in the vicinity of the project site.

To further address additional noise impacts that might be perceived noisy by the community, staff proposes **NOISE-1** through **NOISE-3**, and **NOISE-6**. With implementation of theses COCs, cumulative noise impacts from construction would be less than significant.

Operation

Less Than Significant Impact with Mitigation Incorporated. The only project listed above that may result in a cumulative noise impact when combined with MBGP is ENGP. The rest of the projects listed above have already been accounted for in the existing ambient noise levels at the project's noise sensitive receptors.

At RHMP, the cumulative operational noise level from MBGP and ENGP would be 41 dBA. These projects' operational noise levels would not increase the ambient noise level at RHMP (50 dBA).

The daytime ambient noise level at SBR is 43 dBA L_{eq}. The cumulative operational noise level from MBGP and ENGP would not increase the ambient noise level at SBR.[7]

Therefore, MBGP's operation would not contribute to cumulative noise impacts.

5.9.3 Applicable LORS and Project Conformance

Table 5.9-1 staff's determination of conformance with applicable local, state, and federal LORS, including any proposed COCs, where applicable, to ensure the project would

5 Cumulative steam blow noise calculations at RHMP: ENGP would increase ambient noise approximately 20 dBA. MBGP would increase ambient noise approximately 10 dBA. Resulting in a cumulative increase of approximately 20 dBA over the ambient.

6 Cumulative steam blow noise calculations at SBR: MBGP would increase ambient noise approximately 12 dBA. ENGP would increase ambient noise approximately 20 dBA. Resulting in a cumulative increase of approximately 21 dBA over the ambient.

7 Cumulative operational noise calculations at SBR: Noise from MBGP would be approximately 34 dBA. Noise from ENGP would be 42 dBA. Resulting in no increase over the ambient noise level.

comply with LORS. As shown in this table, staff concludes that with implementation of specific COCs, the proposed project would be consistent with all applicable LORS. The subsection below, "Staff Proposed Conditions of Certification," contains the full text of the referenced COCs.

TABLE 5.9-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	**Conformance and Basis For Determination**
Federal	
Occupational Health and Safety Act (OSHA)	
Title 29, Code of Federal Regulations, Section 1910.95	**Yes.** COCs **NOISE-3** and **NOISE-5**
State	
California Occupational Health and Safety Act (Cal-OSHA)	
Title 8, California Code of Regulations, Sections 5095-5099	**Yes. NOISE-3** and **NOISE-5**
Local	
Imperial County General Plan	
Noise Element	**Yes. NOISE-6** through **NOISE-8**
Imperial County Ordinance	
Title 9, Division 7: Noise Abatement and Control	**Yes. NOISE-1**, **NOISE-2**, **NOISE-4**, **NOISE-5**, and **NOISE-7**
Title 9, Division 17: Renewable Energy & Transmission Ordinance	**Yes. NOISE-2**, **NOISE-6**, and **NOISE-8**

5.9.4 Conclusions and Recommendations

As discussed above, with implementation of COCs, the project would have a less than significant impact related to noise and vibration and would conform with applicable LORS. Staff recommends adopting the COCs as detailed in subsection "5.9.5 Proposed Conditions of Certification" below.

5.9.5 Proposed Conditions of Certification

The following proposed COCs include measures to both mitigate environmental impacts and ensure conformance with applicable LORS. The conditions below are enforceable as part of the CEC's certificate for the portions of the projects constituting the site and related facility. Additional impacts associated with project components outside of CECs jurisdiction, such as the well complex licensed by CalGEM, the temporary structures such as the laydown yard to be permitted by Imperial County, and the switchyard to be permitted by IID, require mitigation to be less than significant.

This CEQA analysis evaluates all impacts resulting from all aspects of the project, and for the entire project to have less than significant impacts, the mitigation actions described in these COCs would need to be implemented by the various licensing jurisdictions as mitigation measures (MMs). For purposes of the facility certification issued by CEC, the following COCs must be complied with by the applicant on the jurisdictional site and related facilities as delineated in the Project Description, Section 3.1. Verifications set forth below only apply to the COCs, not the MMs.

PUBLIC NOTIFICATION PROCESS

COC NOISE-1/MM NOISE-1 Prior to the start of ground disturbance, the project owner shall notify SBR, RHMP, and businesses in the vicinity of the project site, by mail, or by other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the demolition, construction, and operation of the project. If the telephone is not staffed 24 hours a day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This or a similarly effective telephone number shall be posted at the project site during construction where it is visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: At least 15 days prior to ground disturbance, the project owner shall transmit to the compliance project manager (CPM) a statement, signed by the project owner's project manager, stating that the above notification has been performed, and describing the method of that notification. This communication shall also verify that the telephone number has been established and posted at the site and shall provide that telephone number.

NOISE COMPLAINT PROCESS

COC NOISE-2/MM NOISE-2 Throughout the demolition, construction, and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project-related noise complaints.[8] The project owner or its authorized agent shall:

- use the Noise Complaint Resolution Form (shown below), or a functionally equivalent procedure acceptable to the CPM, to document and respond to the noise complaint;
- attempt to contact the person(s) making the noise complaint within 24 hours;
- conduct an investigation to determine the source of noise in the complaint;
- if the noise is project related, take all feasible measures to reduce the source of the noise; and
- submit the Noise Complaint Resolution Form to the CPM documenting the complaint and actions taken. The form shall include: a complaint summary, including the final results of noise reduction efforts and, if obtainable, a signed statement by the complainant that states that the noise problem has been resolved to the complainant's satisfaction.

8 A project-related noise complaint is a complaint about noise that is caused by the project as opposed to another source and may constitute a violation by the project of any noise condition of certification, which is documented by an individual or entity affected by such noise.

Verification: Within five days of receiving a noise complaint, the project owner shall file with the CPM the Noise Complaint Resolution Form, that documents the resolution of the complaint. If mitigation is required to resolve the complaint, and the complaint is not resolved within three business days, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is implemented.

EMPLOYEE NOISE CONTROL PROGRAM

COC NOISE-3/MM NOISE-3 The project owner shall submit to the CPM for review and approval a noise control program. The noise control program shall be used to reduce employee exposure to high (above permissible) noise levels during demolition and construction in accordance with Title 8, California Code of Regulations, Sections 5095-5099, and Title 29, Code of Federal Regulations, Section 1910.95.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall submit the noise control program to the CPM. The project owner shall make the program available to Cal-OSHA upon request.

OPERATIONAL NOISE RESTRICTIONS

COC NOISE-4/MM NOISE-4 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that operation of the project will not cause noise levels due to power plant operation to exceed 50 dBA L_{eq} at RHMP.

No new pure-tone components may be introduced. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints.

When the project first achieves a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct a continuous daytime noise survey at RHMP. This survey during power plant operation shall also include measurement of one-third octave band sound pressure levels at each of the above locations to ensure that no new pure-tone noise components have been introduced.

If the results from the noise survey indicate that the power plant noise levels (L_{eq}) at the affected receptors exceed the above values for any given hour during the survey, mitigation measures shall be implemented to reduce noise to a level of compliance with this limit.

If the results from this noise survey indicate that pure tones are present, mitigation measures shall be implemented to eliminate the pure tones.

Verification: The survey shall take place within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity. Within 30 days after completing the survey, the project owner shall submit a summary report of the

survey to the CPM. Included in the survey report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. When these measures are in place, the project owner shall repeat the noise survey.

Within 15 days of completion of the new survey, the project owner shall submit to the CPM a summary report of the new noise survey, performed as described above and showing compliance with this condition.

OCCUPATIONAL NOISE SURVEY

COC NOISE-5/MM NOISE-5 Following the project's attainment of a sustained output of 85 percent or greater of its rated capacity, the project owner shall conduct an occupational noise survey to identify any noise hazardous areas within the power plant.

The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, Sections 5095-5099 and Title 29, Code of Federal Regulations, Section 1910.95(g)(3). The survey results shall be used to determine the magnitude of employee noise exposure.

The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures to be employed in order to comply with the above regulations.

Verification: Within 30 days after completing each survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to Cal-OSHA upon request from Cal-OSHA.

CONSTRUCTION AND DEMOLITION NOISE RESTRICTIONS

COC NOISE-6/MM NOISE-6 Heavy equipment operation and noisy[9] demolition and construction work relating to any project features, including linear facilities and pile driving, shall be restricted to the times delineated below:

Mondays through Fridays and designated holidays: 7:00 a.m. to 7:00 p.m.

Saturdays: 9:00 a.m. to 6:00 p.m.

Sundays: Construction not allowed

Demolition and construction work shall be performed in a manner to ensure excessive noise (noise that draws a project-related complaint) is prohibited and the potential for noise complaints is reduced as much as practicable. Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers

9 "Noisy" means noise that has the potential to cause project-related noise complaints (for the definition of "project-related noise complaint", see the footnote in condition of certification NOISE-2)

and other state-required noise attenuation devices. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use (jake braking) shall be limited to emergencies.

Verification: Prior to ground disturbance, the project owner shall transmit to the CPM a statement acknowledging that the above restrictions will be observed throughout the demolition and construction of the project.

STEAM BLOW RESTRICTIONS

COC NOISE-7/MM NOISE-7 When using a high-pressure steam blow process, the project owner shall limit noise from steam blows by requiring the use of a rock muffler or other forms of effective silencers to reduce the noise at the project site. The project owner shall notify RHMP and the business owners in the vicinity of the project site of the impending steam blows prior to start of steam blow activities. The steam blows shall be conducted between 7:00 a.m. and 7:00 p.m. Mondays through Fridays, and between 9:00 a.m. and 6:00 p.m. on Saturdays.

Verification: At least 15 days prior to the first steam blow, the project owner shall notify RHMP and the business owners in the vicinity of the project site. The notification may be in the form of letters, or other effective means as approved by the CPM. The notification shall include a description of the purpose and nature of the steam blows, the planned schedule, expected sound levels at RHMP and businesses in the vicinity of the project, and an explanation that it is a one-time activity and not part of normal power plant operation.

PILE DRIVING

COC NOISE-8/ MM NOISE-8 The project owner shall perform pile driving in a manner to reduce the potential for any project-related noise and vibration complaints. The project owner shall notify RHMP and business owners in the vicinity of pile driving prior to start of these activities.

Verification: At least 15 days prior to first pile driving, the project owner shall submit to the CPM a description of the pile driving technique to be employed, including calculations showing its projected noise impacts and peak particle velocity at monitoring locations RHMP. Examples of noise-reducing techniques include: (1) the use of pads or impact cushions of plywood; (2) dampened driving, which involves some form of blanket or enclosure around the hammer; and (3) the use of vibratory drivers or hydraulic pile pushers instead of impact drivers.

At least 10 days prior to first production pile driving, the project owner shall notify RHMP and the business owners in the vicinity of the project. The notification may be in the form of letters, or other effective means, as approved by the CPM. In this notification, the project owner shall state that it will perform this activity in a manner to reduce the potential for any project-related noise and vibration complaints.

EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

Morton Bay Geothermal Project (23-AFC-01)
NOISE COMPLAINT LOG NUMBER _____ Complainant's name and address: Phone number: _____
Date complaint received: _____ Time complaint received: _____
Nature of noise complaint:
Definition of problem after investigation by plant personnel: Date complainant first contacted: _____
Initial noise levels at 3 feet from noise source _____ dBA Date: _____ Initial noise levels at complainant's property: _____ dBA Date: _____ Final noise levels at 3 feet from noise source: _____ dBA Date: _____ Final noise levels at complainant's property: _____ dBA Date: _____
Description of corrective measures taken: Complainant's signature: _____ Date: _____
Approximate installed cost of corrective measures: $ _____ Date installation completed: _____ Date first letter sent to complainant: _____ (copy attached) Date final letter sent to complainant: _____ (copy attached)
This information is certified to be correct: Plant Manager's Signature: _____

(Attach additional pages and supporting documentation, as required).

5.9.6 References

Caltrans 2013 – California Department of Transportation (Caltrans). Technical Noise Supplement to the Caltrans Traffic Noise Analysis Protocol, A Guide for Measuring, Modeling, and Abating Highway Operation and Construction Noise Impacts, Division of Environmental Analysis, Environmental Engineering, September 2013. Report No. CT-HWANP-RT-13069.25.3. Accessed on May 19, 2023. Available online at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/traffic-noise-protocol-april-2020-a11y.pdf

Imperial County 2015 – Imperial County. Planning & Development Services. Noise Element. Imperial County General Plan. Adopted November 9, 1993. Updated October 6, 2015. Accessed on December 15, 2023. Available online at: https://www.icpds.com/planning/land-use-documents/general-plan/noise-element

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Jacobs 2023a – Jacobs (TN 249723). Morton Bay Geothermal Project Application for Certification, Volume 1, dated April 18, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

5.10 Public Health

Huei-An (Ann) Chu

The purpose of this section of the Preliminary Staff Assessment (PSA) is to determine if emissions of toxic air contaminants (TACs) from the proposed Morton Bay Power Geothermal Project (MBGP or project) would have the potential to cause significant adverse public health impacts or to violate standards for the protection of public health. If potentially significant health impacts are identified, staff would identify and recommend mitigation measures necessary to reduce such impacts to insignificant levels.

In addition to the analysis in this **Public Health** section that focuses on potential effects on the public from emissions of TACs, CEC staff addresses the potential impacts of regulated, or criteria, air pollutants in the **Air Quality** section of this PSA and assesses the health impacts on public and workers from accidental releases of hazardous materials in the **Hazards, Hazardous Materials, and Wildfire** sections. The health and nuisance effects from electric and magnetic fields are discussed in the **Transmission Line Safety and Nuisance** section. Pollutants released from the project's wastewater streams are discussed in the **Water Resources** section. Releases in the form of hazardous and nonhazardous wastes are described in the **Solid Waste Management** section.

5.10.1 Environmental Setting

Existing Conditions

The proposed project would consist of a proposed geothermal Resource Production Facility (RPF), a Power Generation Facility (PGF), and associated facilities in Imperial County, California. The project would be owned by Morton Bay Geothermal LLC (Project owner or "Applicant"), along with the associated gen-tie (Jacobs 2023ii, pg. 5.9-1).

Air would be the dominant pathway for public exposure to chemical substances released by project construction and operation. Airborne construction-related emissions would consist primarily of combustion by-products from onsite, diesel-fired construction equipment and vehicles. Airborne operation-related emissions would consist primarily of combustion by-products from three diesel-fired emergency generators and one diesel fire water pump, a hydrochloric acid (HCl) storage tank and associated scrubber, and those generated by the processing, condensing, and venting of geothermal fluid from the RPF (Jacobs 2023ii, pg. 5.9-1).

Toxic Air Contaminants (TACs)

Health and Safety Code, section 39655 defines a toxic air contaminant (TAC) as "an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health." In addition, substances that have been listed as hazardous air pollutants (HAPs) pursuant to 42 U.S.C. section 7412 are TACs under the state law pursuant to Health and Safety

Code, section 39657 (b). CARB formally identified HAPs in California Code of Regulations, Title 17, section 93001 (OEHHA 2024).

TACs, also referred to as HAPs or air toxics, are different from criteria pollutants, such as ground-level ozone, particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. Criteria pollutants are regulated using National Ambient Air Quality Standard (NAAQS) and California Ambient Air Quality Standard (CAAQS). However, there are no ambient standards for most TACs, therefore, site-specific health risk assessments (HRAs) are conducted to evaluate whether risks of exposure to TACs create an adverse impact. Specific TACs have known acute, chronic, and cancer health impacts. The California Air Resources Board (CARB) has identified TACs in the California Code of Regulations, Title 17, sections 93000 and 93001. The nearly 200 regulated TACs include asbestos, organic chemical compounds, and inorganic chemical compounds and compound categories, diesel exhaust, and certain metals. The requirements of the Air Toxic "Hot Spots" Information and Assessment Act of 1987 (Health and Saf. Code, §44300 et seq.) apply to facilities that emit these listed TACs above regulated threshold quantities.

Health Effects of TACs

The health effects associated with TACs are quite diverse and generally are assessed locally rather than regionally. TACs could cause long-term health effects, such as cancer, birth defects, neurological damage, asthma, bronchitis, or genetic damage; or short-term effects, such as eye watering, respiratory irritation (a cough), runny nose, throat pain, and headaches (BAAQMD 2017, pg. 5-1). Numerous other health effects also have been linked to exposure to TACs, including heart disease, Sudden Infant Death Syndrome, respiratory infections in children, lung cancer, and breast cancer (OEHHA 2015).

Health Effects of Hydrogen Sulfide (H_2S)

Geothermal power plants emit high amount of hydrogen sulfide (H2S). Exposure to low concentrations of H_2S may cause irritation to the eyes, nose, or throat. It may also cause difficulty in breathing for some asthmatics. Respiratory distress or arrest has been observed in people exposed to very high concentrations of H_2S. Exposure to low concentrations of H_2S may cause headaches, poor memory, tiredness, and balance problems. Brief exposures to high concentrations of H_2S can cause loss of consciousness. In most cases, the person appears to regain consciousness without any other effects. However, in some individuals, there may be permanent or long-term effects such as headaches, poor attention span, poor memory, and poor motor function.

Site and Vicinity Description

The proposed MBGP is in a region of the Imperial Valley, southeast of the Salton Sea, characterized mostly by agriculture and geothermal power production, with more recent additions of utility scale solar power plants. The area surrounding the plant site is primarily agricultural land. The Imperial Valley is in the southwest part of the Colorado Desert that merges northwestward into the Coachella Valley near the northern shore of the Salton Sea (Jacobs 2023ii, pg. 5.9-1).

The PGF would be on approximately 51 acres (plant site) of a 160-acre parcel within the unincorporated area of Imperial County, California. The plant site is west of the existing Hudson Ranch Power 1 Plant (Jacobs 2023ii, pg. 5.9-1). The project site is bounded by McDonald Road to the north, Davis Road to the east, and Schrimpf Road to the south. The town of Niland is approximately four miles northeast of the plant site, and the town of Calipatria is approximately seven miles southeast of the plant site. The Red Hill Marina County Park is approximately 1.6 miles east of the PGF. The Alamo River is approximately 0.7 mile southeast of the plant site, and the New River is approximately five miles southwest of the plant site (Jacobs 2023ii, pg. 5.9-2).

In addition to the power generating facility and linears, the project also consists of offsite components that fall outside the CEC's jurisdiction but are part of the overall geothermal project. These components include the geothermal well field under the jurisdiction of the county and CalGEM, the switching station under the jurisdiction of IID, the temporary laydown/parking area, borrow pits, and construction worker camp under the jurisdiction of the county. The impacts of these offsite components are considered as part of this analysis.

Sensitive Receptors

Sensitive receptors, such as infants, the aged, and people with specific illnesses or diseases, are the subpopulations which are more sensitive to the effects of toxic substance exposure.

Schools, both public and private, day care facilities, convalescent homes, and hospitals are of particular concern. Although residences and worker receptors are not technically defined as "sensitive receptors" by OEHHA, they were conservatively analyzed as sensitive receptors in Applicant's analysis due to the lack of sensitive receptors near the facility (Jacobs 2023ii, pg. 5.9-2, Jacobs 2023rr, Table 6). Appendix 5.9A of the application (Jacobs 2023rr, Table 1) delineates data on the population by census tract within a six-mile radius of the project site, as well as a comprehensive list of sensitive receptors analyzed in the HRA. As explained in the **Air Quality** section on Localized Cumulative Impacts, a distance of six miles is used because based on staff's modeling experience, beyond six miles there is no statistically significant concentration overlap for nonreactive pollutant concentration between two stationary emission sources. The six-mile distance conservatively ensures that all potential sensitive receptors are considered in the HRA.

Meteorology and Climate

Meteorological conditions, including wind speed, wind direction, and atmospheric stability, affect the extent to which pollutants are dispersed into the air and the direction of pollutant transport. This, in turn, affects the level of public exposure to emitted pollutants along with associated health risks.

Climatic conditions in Imperial County are governed by the large-scale sinking and warming of air in the semi-permanent tropical high-pressure center of the Pacific Ocean.

The high-pressure ridge blocks out most mid-latitude storms except in winter when it is weakest and farthest south. The coastal mountains prevent the intrusion of any cool, damp air found in California coastal environs. Because of the barrier and weakened storms, Imperial County experiences clear skies, extremely hot summers, mild winters, and little rainfall. On average, the sun shines more in Imperial County than anywhere else in the United States (Imperial County Air Pollution Control District (ICAPCD) 2018).

Winters are mild and dry with daily average temperatures ranging between 65 and 75 degrees Fahrenheit (ºF) (18-24 degrees Celsius [ºC]). During winter months, it is not uncommon to record maximum temperatures of up to 80ºF. Summers are extremely hot with daily average temperatures ranging between 104 and 115ºF (40-46ºC). It is not uncommon to record maximum temperatures of 120ºF during summer months (ICAPCD 2018).

The flat terrain of the valley and the strong temperature differentials created by intense solar heating produce moderate winds and deep thermal convection. The combination of subsiding air, protective mountains, and distance from the ocean severely limits precipitation. Rainfall is highly variable with precipitation from a single heavy storm able to exceed the entire annual total during a later drought condition. The average annual rainfall is just over three inches (7.5 centimeters) with most of it occurring in late summer or mid-winter (ICAPCD 2018).

Humidity is low throughout the year, ranging from an average of 28 percent in summer to 52 percent in winter. The large daily oscillation of temperature produces a corresponding large variation in the relative humidity. Nocturnal humidity rises to 50 to 60 percent but drops to about 10 percent during the day (ICAPCD 2018).

The wind in Imperial County follows two general patterns. Wind statistics indicate prevailing winds are from the west-northwest through southwest; a secondary flow maximum from the southeast is also evident. The prevailing winds from the west and northwest occur seasonally from fall through spring and are known to be from the Los Angeles area. Occasionally, Imperial County experiences periods of extremely high wind speeds wherein wind speeds can exceed 31 miles per hour (mph). This occurs most frequently during the months of April and May. However, speeds of less than 6.8 mph account for more than one-half of the observed wind measurements (ICAPCD 2018).

The annual wind rose plot (from 2015 to 2018, and 2021) for the Imperial County Airport monitoring station (KIPL, WBAN ID: 03144), which is approximately 40 km to the south of the project, shows that the prevailing winds that blow to the proposed MBGP site were mostly from the west and southwest (Jacobs 2023ii, Figure 5.1-3). Please refer to the **Air Quality** section of this PSA for more details.

Existing Public Health Concerns

As previously noted, the proposed project site is in Imperial County, within the Imperial County Air Pollution Control District (ICAPCD). This analysis is prepared to identify the

current status of respiratory diseases (including asthma), cancer, and childhood mortality rates in the population within the same county or air basin of the proposed project site. Such assessment of existing health concerns provides staff with a basis to evaluate the significance of any additional health impacts from the project and assess the need for further mitigation.

Cancer

When examining such risk estimates, staff considers it important to note that the overall lifetime risk of developing cancer for the average male in the United States is about 1 in 2, or 500,000 in one million and about 1 in 3, or 333,333 in one million for the average female (ACS 2023a).

From 2015 to 2019, the cancer incidence rates in California were 42.79 in one million for males and 38.77 for females. Also, from 2016 to 2020, the cancer death rates for California are 15.83 in one million for males and 11.82 in one million for females (ACS 2023b, Cancer Facts & Figures 2023, Table 4 and Table 5). The trends are toward lower values compared to earlier results of previous periods.

By examining the State Cancer Profiles presented by the National Cancer Institute, staff found that the trend of cancer death rates in Imperial County had been falling between 2016 and 2020. These rates (of 12.24 in one million, combined male/female) were somewhat lower than the statewide average of 13.51 in one million (NCI 2024a).

According to the County Health Status Profiles 2023, the death rate due to all cancers, from 2019 to 2021, is 10.63 in one million for Imperial County, slightly lower than the cancer death rate (12.49 in one million) for California (CDPH 2023, Table 2).

Lung Cancer

As for lung and bronchus cancers, from 2015 to 2019 the cancer incidence rates in California were 4.38 in one million for males and 3.6 in one million for females. Also, from 2016 to 2020 the cancer death rates for California were 2.98 in one million for males and 2.16 in one million for females (ACS, 2023b, Table 4 and Table 5). The trends are toward lower values compared to earlier results of previous periods.

The statistics from State Cancer Profiles are similar: Lung and Bronchus Cancer incidence rates in Imperial County between 2016 and 2020 were 3.22 in one million, which is slightly lower than the incidence rate of the entire state (3.76 in one million) (NCI 2024b).

According to the County Health Status Profiles 2023, the death rate due to lung cancers, from 2019 to 2021, is 1.58 in one million for Imperial County, slightly lower than the death rate (2.16 in one million) for California (CDPH 2023, Table 4).

Asthma

The asthma diagnosis rates in Imperial County are higher than the average rates in California for both adults (age 18 and over) and children (ages 1-17). The percentage of

adults diagnosed with asthma was reported as 8.9 percent in 2005-2007, compared to 7.7 percent for the general California population. Rates for children for the same 2005-2007 period were reported as 12.2 percent in Imperial County compared to 10.1 percent for the state in general (Wolstein et al., 2010).

According to the California Health Interview Survey (CHIS), the current asthma prevalence in Imperial County from 2019 to 2020 for adults is 11.9%, higher than the state (9.1%). The current asthma prevalence in Imperial County from 2019 to 2020 for children is 7.5%, slightly higher than the state (7.4%) (CDPH 2024).

Valley Fever

An additional respiratory illness for the area is Valley Fever (Coccidioidomycosis). Valley Fever is an infection that occurs when the spores of the fungus Coccidioides immitis enter a human's lung through inhalation. When people breathe in these Coccidioides spores, they are at risk of developing Valley Fever.

Valley Fever is currently found in six southwestern states, including California. In California, the highest Valley Fever rates have been recorded in Merced, Fresno, Tulare, Kern, Monterey, Kings, and San Luis Obispo counties (CDC 2021). Imperial County has lower rates of reported cases compared to other areas in California and is in a suspected endemic area (CDC 2012).

The Valley fever rates of 2018 in Imperial County is 5-9 per 100000 population (CDC 2021). The map by National Notifiable Diseases Surveillance System (NNDSS) shows the average incidence of reported Valley fever per 100,000 people, by county, during 2011–2017. The rate of Imperial County falls in the category of >0-5.9 (CDC 2020b).

Conclusion

Given this information and considering the complexity of the proposed project which has multiple sources of multiple pollutants, staff also conducted an in-depth analysis of existing health issues in the vicinity of Imperial County where the proposed site would be located. The existing health analysis includes asthma, Valley Fever, and cancer. Current data shows that Imperial County is ranked above average among counties of California with better overall health outcomes.

Regulatory

Federal

The federal Clean Air Act (CAA), section 112 (42 U.S.C., § 7412) (**National Emission Standards for Hazardous Air Pollutants [NESHAP]).** CAA Section112: NESHAP regulates emissions of air pollutants that are hazardous to human health or the environment, called hazardous air pollutants (HAPs). New sources that emit more than 10 tons per year (tpy) of any specified HAP or more than 25 tpy of any combination of HAPs are required to apply Maximum Achievable Control Technology (MACT).

National Emission Standards for Hazardous Air Pollutants (NESHAP) Subpart ZZZZ—National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. NESHAP Subpart ZZZZ applies to the project's diesel-fired emergency gensets. However, because NSPS Subpart IIII also applies to the gensets, the units would comply with NESHAP Subpart ZZZZ by complying with the requirements of NSPS Subpart IIII. Please refer to **Air Quality** section for details.

State

California Health and Safety Code section 41700. This section states that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property."

The Air Toxics "Hot Spots" Information and Assessment Act (Assembly Bill [AB] 2588, 1987, Connelly) or California Health and Safety Code sections 44330. The Act requires that toxic air emissions from stationary sources (facilities) be quantified and compiled into an inventory according to criteria and guidelines developed by the ARB, that each facility be prioritized to determine whether a risk assessment must be conducted, that the risk assessments be conducted according to methods developed by the Office of Environmental Health Hazard Assessment (OEHHA), that the public be notified of significant risks posed by nearby facilities, and that emissions which result in a significant risk be reduced.

Local

Rule 207 - New and Modified Stationary Source Review. Air District Rule 207 requires preconstruction review and permitting of new or modified stationary sources of air pollution, including air toxics.

Rule 216 - Construction or Reconstruction of Major Stationary Sources That Emit Hazardous Air Pollutants. Air District Rule 216 requires all owners and operators of stationary sources that emit hazardous air pollutants (HAPs) to install best available control technology for toxics (T-BACT) to any constructed or reconstructed major source.

Rule 407 – Nuisance. Air District Rule 407 prohibits public nuisances. No Person shall discharge from any source whatsoever such quantities of Air Contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such persons or the public or which cause or have a natural tendency to cause injury or damage to business or property.

Rule 1001 – National Emission Standards for Hazardous Air Pollutants. Air District Rule 1001 identifies the provision from Part 61, Chapter I, Title 40 of the Code of

Federal Regulations (40 CFR Part 61) that are incorporated as part of the Air District Rules and Regulations. The MBGP is not subject to any of the provisions listed in Rule 1001 Section D; therefore, the Applicant would not be subject to this rule.

Rule 1002 – California Airborne Toxic Control Measures (ATCMs). Air District Rule 1002 outlines the provisions of the Final Regulation Orders contained in Title 17 of the California Code of Regulations that have been incorporated into the Air District Rules and Regulations. Of the incorporated provisions, the MBGP would be subject to Section 93115 Airborne Toxic Control Measure for Stationary Cl Engines (Diesel ATCM). Each diesel engine driving a proposed emergency combustion unit (e.g., emergency generators, fire pump) would be subject to the requirements of the Diesel ATCM. The permittee would comply with the Diesel ATCM by limiting the hours of maintenance and testing to a maximum of 50 hours per year for each diesel emergency engine at the MBGP facility, as well as ensuring that the facility's workers only use CARB approved fuel for each unit. The proposed emergency standby diesel-fuel engines have emission factors in compliance with the standards in Air District Rule 1002 Section D.

Rule 1003 – Hexavalent Chromium Emissions from Cooling Tower. Air District Rule 1003 establishes provisions to limit potential hexavalent chromium emissions from cooling tower. The Applicant is expected to comply with this rule by not dosing the cooling tower circulating water with chromium containing compounds. To demonstrate compliance with this rule, the Applicant would have to test the cooling tower circulation water every six months to demonstrate that the concentrations of hexavalent chromium do not exceed 0.15 milligrams per liter. In addition, the Applicant would be required to submit a cooling tower compliance plan to the Air District and compliance project manager (CPM) before the ATC and PTO is issued. This plan must be maintained onsite and subject to inspection by the CEC or Air District upon request.

Cumulative

According to **Section 1 Executive Summary, Table 1-1** and the application for certification (AFC), the existing, approved, pending and proposed projects within six miles include:

- Elmore North (1.3 miles SW of the project)
- JJ Elmore Power Plant (1.3 miles SW of the project)
- Black Rock (3 miles SW of the project)
- Energy Source Mineral ATLIS Project (0.1 miles east of the project)
- Hudson Ranch Power 1 Plan (0.3 miles east of the project)
- Geo Hudson Ranch (0.6 miles east of the project)
- Hell's Kitchen (1.2 miles north of the project)
- Midway IV (4.5 miles southeast of the project)
- Wilkinson solar farm (5.8 miles southeast of the project)

This analysis considers how the Morton Bay project along with these projects may impact the health of the identified receptors.

5.10.2 Environmental Impacts

PUBLIC HEALTH	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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 determination.				
a. Would the project expose sensitive receptors to substantial pollutant concentrations or result in other public health impacts?	☐	☒	☐	☐

Environmental checklist established by CEQA Guidelines, Appendix G, air quality and staff additions.

5.10.2.1 Methodology and Thresholds of Significance

This section discusses TAC emissions to which the public could be exposed during project construction/demolition and routine operation. As mentioned above, since non-criteria pollutants[1] do not have ambient (outdoor) air quality standards that specify health-based levels considered safe for everyone, a HRA is used to determine if people might be exposed to those types of pollutants at unhealthy levels.

The standard approach currently used for a HRA involves four steps: 1) hazard identification, 2) exposure assessment, 3) dose-response assessment and 4) risk characterization (OEHHA, 2003). These four steps are briefly discussed below:

1. **Hazard identification** is conducted to determine the potential health effects that could be associated with project emissions. For air toxics sources, the main purpose is to identify whether or not a hazard exists. Once a hazard has been identified, staff evaluates the exact toxic air contaminant(s) of concern and determines whether a TAC is a potential human carcinogen or is associated with other types of adverse health effects.
2. **An exposure assessment** is conducted to estimate the extent of public exposure to project emissions, including: (1) the worst-case concentrations of project emissions in the environment using dispersion modeling; and (2) the amount of pollutants that people could be exposed to through inhalation, ingestion, and dermal contact via contaminated air, food, water or soil. Therefore, this step involves emissions quantification, modeling of environmental transport and dispersion, evaluation of

1 Carbon dioxide (CO2) is also a non-criteria pollutant, but it is also not considered a TAC at normal consideration and is not evaluated in this analysis.

environmental fate, identification of exposure routes, identification of exposed populations and sensitive subpopulations, and estimation of short-term and long-term exposure levels.

3. **A dose-response assessment** is conducted to characterize the relationship between exposure to an agent and incidence of an adverse health effect in exposed populations. The assumptions and methodologies of dose-response assessment are different between cancer and noncancer health effects. In cancer risk assessment, the dose-response relationship is expressed in terms of a potency (or slope) factor that is used to calculate the probability of getting cancer associated with an estimated exposure. In cancer risk assessment, it is assumed that risk is directly proportional to dose. It is also assumed that there is no threshold for carcinogenesis. In non-cancer risk assessment, dose-response data developed from animal or human studies are used to develop acute and chronic non-cancer Reference Exposure Levels (RELs). The acute and chronic RELs are defined as the concentration at which no adverse non-cancer health effects are anticipated. Unlike cancer health effects, non-cancer acute and chronic health effects are generally assumed to have thresholds for adverse effects. In other words, acute or chronic injury from a TAC would not occur until exposure to the pollutant has reached or exceeded a certain concentration (i.e., threshold).
4. **Risk characterization** is conducted to integrate the health effects and public exposure information and to provide quantitative estimates of health risks resulting from project emissions. Staff characterizes potential health risks by comparing worst-case exposure to safe standards based on known health effects.

Staff conducts its public health analysis by evaluating the information and data provided in the AFC by the applicant. Staff also relies upon the expertise and guidelines of the California Environmental Protection Agency (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) in order to: (1) identify contaminants that cause cancer or other noncancer health effects, and (2) identify the toxicity, cancer potency factors and non-cancer RELs of these contaminants. Staff relies upon the expertise of the California Air Resources Board (CARB) and local air districts to conduct ambient air monitoring of TACs and on the California Department of Public Health (CDPH) to evaluate pollutant impacts in specific communities. The public health related data sets, guidelines and technical analysis issued by these agencies are routinely relied on by experts in the field of public health to perform project level analysis to identify any impacts to public health from the construction and operation of the project.

For each project, a screening-level risk assessment is initially performed using simplified assumptions that are intentionally biased toward protection of public health. That is, staff uses an analysis designed to overestimate public health impacts from exposure to project emissions. It is likely that the actual risks from the source in question would be much lower than the risks as estimated by the screening-level assessment. The risks for such screening purposes are based on examining conditions that would lead to the highest, or

worst-case, risks and then using those assumptions in the assessment. Such an approach usually involves the following:

- using the highest levels of pollutants that could be emitted from the plant;
- assuming weather conditions that would lead to the maximum ambient concentration of pollutants;
- using the type of air quality computer model which predicts the greatest plausible impacts;
- calculating health risks at the location where the pollutant concentrations are estimated to be the highest, even if it is unlikely anybody would be in that area;
- assuming that an individual's exposure to carcinogenic (cancer-causing) agents would occur continuously for 30 or 70[2] years; and
- using health-based objectives aimed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses).

A screening-level risk assessment would, at a minimum, include the potential health effects from inhaling hazardous substances. Some facilities would also emit certain substances (e.g. semi-volatile organic chemicals and heavy metals) that could present a health hazard from non-inhalation pathways of exposure (OEHHA 2003, Tables 5.1, 6.3, 7.1). When these multi-pathway substances are present in facility emissions, the screening-level analysis would include the following additional exposure pathways: soil ingestion, dermal exposure, consumption of locally grown plant foods, mother's milk and water ingestion[3] (OEHHA 2003, pg. 5-3).

The HRA process addresses three categories of health impacts: (1) acute (short-term) health effects, (2) chronic (long-term) noncancer effects, and (3) cancer risk (also long-term). They are discussed below.

2 In 2015 Guidance, OEHHA recommends that an exposure duration (residency time) of 30 years (instead of 70 years) be used to estimate individual cancer risk for the maximally exposed individual resident (MEIR). In addition, for the maximally exposed individual worker (MEIW), OEHHA now recommends using an exposure duration of 25 years (instead of 40 years) to estimate individual cancer risk for off-site workers (OEHHA 2015, Table 8.5).

3 The HRA exposure pathways for the proposed project included inhalation, soil ingestion, dermal (through the skin) absorption, mother's milk, home-grown produce, beef/dairy ingestion, and pig/chicken/egg ingestion (Jacobs 2023ii, Table 5.9-8), not including water ingestion because water sources are not impacted by the project.

Acute Noncancer Health Effects

Acute health effects are those that result from short-term (one-hour) exposure to relatively high concentrations of pollutants. Such effects are temporary in nature and include symptoms such as irritation of the eyes, skin, and respiratory tract.

Chronic Noncancer Health Effects

Chronic noncancer health effects are those that result from long-term exposure to lower concentrations of pollutants. Long-term exposure is defined as more than 12 percent of a lifetime, or about eight years (OEHHA 2003, pg. 6-5). Chronic noncancer health effects include heart and respiratory system diseases that reduced breathing efficiency such as asthma.

Reference Exposure Levels (RELs)

The analysis for both acute and chronic noncancer health effects compares the maximum project contaminant levels to safe levels known as Reference Exposure Levels, or RELs. These are amounts of toxic substances to which even sensitive individuals could be exposed without suffering any adverse health effects (OEHHA 2003, pg. 6-2). In other word, the REL is a concentration below which there is assumed to be no observable adverse health impact to a target organ system. These exposure levels are specifically designed to protect the most sensitive individuals in the population, such as infants, the aged, and people with specific illnesses or diseases which make them more sensitive to the effects of toxic substance exposure. The RELs are based on the most sensitive adverse health effect reported in the medical and toxicological literature and include specific margins of safety. The margins of safety account for uncertainties associated with inconclusive scientific and technical information available at the time of setting the RELs. They are therefore meant to provide a reasonable degree of protection against hazards that research has not yet identified.

A noncancer hazard quotient (HQ) signals whether such chronic health effects are likely from exposure to one chemical. If there are exposures to multiple chemicals, the HQ for each chemical is added up to calculate a hazard index (HI) (OEHHA 2020).

The HQ is estimated using the predefined reference exposure level (REL) of a pollutant, ground level concentration, exposure duration, and other parameters. For an acute HQ the one-hour maximum concentration is divided by the acute REL for the substance. For a repeated 8 hr HQ, the 8 hr average concentration is divided by the 8 hour REL. For a chronic HQ, the annual concentration is divided by the chronic REL (CARB 2015, pg.95 and Table 9-1).

Concurrent exposure to multiple toxic substances would result in health effects that are equal to, less than, or greater than effects resulting from exposure to the individual chemicals. Only a small fraction of the thousands of potential combinations of chemicals have been tested for the health effects of combined exposures. In conformity with California Air Pollution Control Officers Association (CAPCOA) guidelines, the HRA

assumes that the effects of each substance are additive for a given organ system (OEHHA 2003, pg. 1-5 and 8-12). Noncancer risk is then indicated with a HI number for pollutant-targeted organ systems (CARB, pg. 75). The HI is the sum of two or more hazard quotients for multiple substances and/or multiple exposure pathways. Other possible mechanisms due to multiple exposures include those cases where the actions would be synergistic or antagonistic (where the effects are greater or less than the sum, respectively). For these types of exposures, the health risk assessment (HRA) could underestimate or overestimate the risks.

Cancer Risks

For carcinogenic substances, the health assessment considers the risk of developing cancer and assumes that continuous exposure to the carcinogen would occur over a 30 or 70-year lifetime[4]. The risk that is calculated is not meant to project the actual expected incidence of cancer, but rather a theoretical upper-bound estimate based on the worst-case assumptions.

Cancer Potency Factors

Cancer risk is the likelihood that a person would develop cancer and is expressed in terms of chances per million of developing cancer over a lifetime from exposure to a chemical contaminant. If a person is exposed to multiple cancer-causing chemicals from a site, the risk from each chemical is added up to calculate the person's cumulative cancer risk. The cancer risk estimate does not include a person's background risk, which is the risk a person faces of developing cancer due to other causes (OEHHA 2020).

Cancer risk is a function of the maximum expected pollutant concentration, the probability that a particular pollutant would cause cancer (called potency factors), and the length of the exposure period. Cancer risks for individual carcinogens are added together to yield a total cancer risk for each potential source. The conservative nature of the screening assumptions used means that the actual cancer risks from project emissions would be considerably lower than estimated.

Cancer risk is calculated using the predefined cancer potency factor of a pollutant, ground level exposure concentration, duration of exposure, and other parameters (e.g., age sensitivity) (CARB 2015, Table 9-1). As previously noted, the screening analysis is performed to assess the worst-case risks to public health associated with the proposed project. If the screening analysis were to predict a risk below significance levels, no further analysis would be necessary and the source would be considered acceptable with regard to carcinogenic effects. If, however, the risk were to be above the significance level, then further analysis using more realistic site-specific assumptions would be performed to obtain a more accurate estimate.

4 See footnote 1.

Significance Criteria

CEC staff assesses the maximum cancer and noncancer impacts from specific carcinogenic and non-carcinogenic exposures by first estimating the potential impacts on the maximally exposed individual. This is a person hypothetically exposed to project emissions at a location where the highest ambient impacts were calculated using the worst-case assumptions. Since the individual's exposure would produce the maximum impacts possible around the source, staff uses this risk estimate as a marker for acceptability of the project's impacts on public health.

The ICAPCD does not have established health risk thresholds; therefore, the applicant has conservatively relied on the risk thresholds for the neighboring South Coast Air Quality Management District (SCAQMD), as presented in **Table 5.10-1**. These are consistent with the notification levels established by CARB for Imperial County under AB 2588 (CARB 2021) and staff agrees that use of the SCAQMD thresholds are appropriate and applicable to this project.

TABLE 5.10-1 HEALTH RISK SIGNIFICANCE THRESHOLD LEVELS FOR SCAQMD

Category	Risk Threshold	Source
Facility-wide	Acute/Chronic HI > 1.0 Incremental Cancer Risk > $10x10^{-6}$ Cancer Burden > 0.5	SCAQMD California Environmental Quality Act (CEQA) Handbook (SCAQMD 2019)

Source: Jacobs 2023ii, Table 5.9-1

Acute and Chronic Noncancer Health Risks

As mentioned above, staff assesses the noncancer health effects by calculating a hazard index. A HI is a ratio obtained by comparing exposure from facility emissions to the safe exposure level (i.e. REL) for that pollutant. When the HI or HQ is less than 1, non-cancer health effects are not expected for people exposed to chemicals from the site. When the number is greater than 1, non-cancer health effects are possible, but not certain (OEHHA 2020).

A Total HI of less than 1.0 would indicate that cumulative worst-case exposures would not lead to significant noncancer health effects. In such cases, asthma and other noncancer health impacts would be considered unlikely even for sensitive members of the population. CEC staff would therefore conclude that there would be no significant asthma and other noncancer project-related public health impacts. This assessment approach is consistent with risk management guidelines of both California OEHHA and the U.S. Environmental Protection Agency (U.S. EPA).

Cancer Risk

A cancer risk that is at or below 1 chance in a million (or 1×10^{-6}) is not a public health concern. This means that no more than one person in a population of one million people exposed to the same level of chemical contaminant(s) at the site would develop cancer over a lifetime (OEHHA 2020).

An incremental cancer risk greater than 10 in one million from a project should be regarded as suggesting a potentially significant carcinogenic impact on public health. The 10 in one million risk level is also used by the Air Toxics "Hot Spots" (AB 2588) program as the public notification threshold for air toxic emissions from existing sources, and by Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986, (Health & Safety Code, §§25249.5 et seq.) for guidance in establishing significance levels for carcinogenic exposures. The significant risk level of 10 in one million is also consistent with the level of significance adopted by many California air districts. In general, these air districts would not approve a project with a cancer risk estimate of more than 10 in one million.

An important distinction between staff's approach and the Proposition 65 risk characterization approach is that the Proposition 65 significance level applies separately to each cancer-causing substance, whereas staff determines significance based on the total risk from all the cancer-causing pollutants to which the individual might be exposed in the given case. Thus, the significance level applied by staff is more conservative (health-protective) than the manner applied by Proposition 65.

As noted earlier, the initial risk analysis for a project is typically performed at a screening level, which is designed to overstate actual risks, so that health protection could be ensured. Staff's analysis also addresses potential impacts on all segments of the population, including the young, the elderly, and individuals with existing medical conditions that would render them more sensitive to the adverse effects of TACs and any minority or low-income populations that are likely to be disproportionately affected by impacts. To accomplish this goal, staff uses the most current acceptable public health exposure levels (both acute and chronic) set to protect the public from the effects of air toxics being analyzed. When a screening analysis shows the cancer risks to be above the significance level, refined assumptions would be applied for likely a lower, more realistic, risk estimate. If, after refined assumptions, the project's risk is still found to exceed the significance level of 10 in one million, staff would recommend appropriate measures to reduce the risk to less than significant levels. If, after all feasible risk reduction measures have been considered and a refined analysis still identifies a cancer risk of greater than 10 in one million, staff would deem such a risk to be significant and unmitigable and would not recommend project approval.

Cancer Burden

To evaluate population risk, regulatory agencies have used the cancer burden as a method to account for the number of incremental cancer cases that could potentially occur in a population. The population burden can be calculated by multiplying the cancer risk and the number of people exposed at various cancer risk levels (OEHHA 2015, pg.1-4, Jacobs 2023ii, pg.5.9-13).

Cancer burden is defined as the estimated increase in the occurrence of cancer cases in a population resulting from exposure to carcinogenic air contaminants. In other words, it is a hypothetical upper-bound estimate of the additional number of cancer cases that

could be associated with toxic air emissions from the project. Cancer burden is calculated as the maximum product of any potential carcinogenic risk greater than 1 in one million, and the number of individuals at that risk level. Therefore, if a predicted derived adjusted cancer risk is greater than 1 in one million, the cancer burden is calculated for each census block receptor. OEHHA requires a 70-year exposure duration to estimated cancer burden or provide an estimate of population-wide risk (OEHHA 2015, pg. 8-1). The assumed exposure duration for nonresidential off-site workers or recreational users would be much less because their exposure time would be much less than 70 years.

5.10.2.2 Direct and Indirect Impacts

a. Would the project expose sensitive receptors to substantial pollutant concentrations or result in other public health impact?

Construction

Less Than Significant. The construction phase of the proposed project, including the switching station shared with the other geothermal projects, is expected to take approximately 29 months, with a few months on both ends for equipment delivery and demobilization (followed by several months of startup and commissioning). Airborne construction-related emissions would consist primarily of combustion by-products from onsite, diesel-fired construction equipment and vehicles (Jacobs 2023ii, pg. 5.9-1 and 5.9-11). During this time, strict construction practices that incorporate safety and compliance with applicable LORS would be followed. In addition, mitigation measures such as best available control techniques would be used to reduce criteria pollutant and DPM emissions from construction activities would be implemented (Jacobs 2023ii, pg. 5.9-11 and 5.9-25).

Fugitive Dust

Fugitive dust is defined as dust particles that are introduced into the air from vehicle and construction equipment, including grading, truck loading/dumping, and travel on paved and unpaved roadways during project construction (Jacobs 2023ii, pg. 5.1-27 and 5.1-28).

Fugitive dust emissions can create a nuisance causing adverse effects. However, it is expected that large stockpiles of earthen materials would not be present during project construction; therefore, wind-blown fugitive dust emissions from earthen stockpiles were assumed to be negligible by the applicant (Jacobs 2023ii, pg. 5.1-28).

The effects of fugitive dust on public health are covered in the **Air Quality** section of this PSA which includes staff's recommended mitigation measures. With the implementation of **AQ-SC1** through **AQ-SC5**, the PM10 impacts of the project during construction would be less than significant. The applicant is proposing to comply with the ICAPCD construction fugitive dust control measures (Jacobs 2023ii, pg. 5.1-27 and 5.1-28) to prevent fugitive dust plumes from leaving the project boundary. As long as the dust

plumes are kept from leaving the project site, there would be no significant concern of fugitive dust adversely affecting public health.

Diesel Exhaust

The primary air toxic pollutant of concern from construction activities is diesel particulate matter (diesel PM or DPM) generated during movement of onsite diesel-fueled construction equipment and vehicles (Jacobs 2023ii, pg. 5.9-11).

Diesel exhaust is a complex mixture of thousands of gases and fine particles and contains over 40 substances listed by the U.S. EPA as HAPs and by CARB as TACs. The solid material in diesel exhaust is known as diesel particulate matter (DPM) (CARB 2023a). Diesel exhaust is also characterized by CARB as "particulate matter from diesel-fueled engines".

DPM has been the accepted surrogate for whole diesel exhaust since the late 1990s. CARB identified DPM as the surrogate compound for whole diesel exhaust in its Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant staff report in April 1998 (Appendix III, Part A, Exposure Assessment [CARB 1998]). DPM is primarily composed of aggregates of spherical carbon particles coated with organic and inorganic substances. Diesel exhaust deserves particular attention mainly because of its ability to induce serious noncancerous effects and its status as a likely human carcinogen. The impacts from human exposure would include both short and long-term health effects. Short-term effects can include increased coughing, labored breathing, chest tightness, wheezing, and eye and nasal irritation. Effects from long-term exposure can include increased coughing, chronic bronchitis, reductions in lung function, and inflammation of the lung. Epidemiological studies strongly suggest a causal relationship between occupational diesel exhaust exposure and lung cancer. Diesel exhaust is listed by the U.S. EPA as "likely to be carcinogenic to humans" (U.S. EPA 2002).

Based on health effects studies, the Scientific Review Panel (SRP) on TACs in 1998 recommended a cancer unit risk factor of $3x10^{-4}$ $(\mu g/m^3)^{-1}$ and a chronic REL for diesel exhaust particulate matter of five micrograms per cubic meter of air ($\mu g/m^3$) (U.S. EPA 2003). However, SRP did not recommend a specific value for an acute REL since available data in support of a value was deemed insufficient. Therefore, there is no acute REL for diesel particulate matter, and it was not possible to conduct an assessment for its acute health effects.

Construction Health Risk Assessment (HRA) for Diesel Exhaust

A screening HRA for DPM was conducted to assess the potential impacts associated with diesel emissions during the construction activities at the proposed project. Although construction-related emissions are considered temporary and localized, resulting in no long-term effects to the public, a screening HRA was conservatively conducted to estimate potential health risks associated with public exposure to DPM during the project construction (Jacobs 2023ii, pg. 5.9-13).

The maximum annual ground-level concentrations used to estimate risk were determined through dispersion modeling with AERMOD (Jacobs 2023ii, pg. 5.9-13). The total DPM exhaust emissions from construction activities were averaged over the 29-month construction period and spatially distributed in the area associated with the construction of the project (Jacobs 2023ii, pg. 5.9-11). The construction HRA estimated the rolling cancer risks for each 29-month period[5] during a 30-year exposure duration (starting with exposure during the third trimester), aligned with the expected construction duration, at the point of maximum impact (PMI), maximally exposed individual resident (MEIR), maximally exposed individual worker (MEIW), and maximally exposed sensitive receptor (Jacobs 2023ii, pg. 5.9-12 and 5.9-13). The incremental cancer risks were estimated according to the Air Toxic Hot Spots Guidance Manual for Preparation of Health Risk Assessments (OEHHA 2015). This HRA was based on the maximum annual average emissions and the maximum annual modeled concentration of DPM (Jacobs 2023ss). The maximum annual ground-level concentrations of DPM used to estimate risk were determined through dispersion modeling with AERMOD (Jacobs 2023ii, pg. 5.9-13). The results are listed in **Table 5.10-2**.

TABLE 5.10-2 CONSTRUCTION HAZARD/RISK FROM DPM

Receptor Type	Cancer Risk Impact (in one million)	Chronic Non-Cancer Hazard Index (HI) (unitless)	Acute Non-Cancer Hazard Index (HI) (unitless)
PMI[1]	**31.7**	0.02	-
MEIR[2]	0.82	0.0005	-
MEIW[3]	0.73	0.02	-
Maximally Exposed Sensitive Receptor[4]	0.82	0.0005	-
SCAQMD Threshold	10	1	1[5]

Notes:
[1] Point of maximum impact (PMI). It is on the east of project fence line.
[2] Maximally exposed individual resident (MEIR). It is approximately 1.3 miles northeast of the project boundary.
[3] Maximally exposed individual worker (MEIW). It is at the same location of PMI. Risks at the worker receptors include a Worker Adjustment Factor (WAF) of 1, Exposure Frequency (EF) of 0.68 (250/365, equivalent to working 5 days/week, 50 week/year) to account for the hours a worker is present at a site.
[4] Maximally Exposed Sensitive Receptor. It is at the same location of MEIR.
[5] The SCAQMD threshold value is for all the pollutants. However, due to insufficient information of a specific value for an acute REL, there is no acute REL for diesel particulate matter, and it was not possible to conduct an assessment for its acute health effects.
Source: Jacobs 2023ii, Table 5.9-11, and HRA modeling files provided by the applicant (Jacob 2023ss)

The HRA results for the short-term construction activities show a maximum off-property residential cancer risk (MEIR) of 0.82 in one million. This impact is below the significance threshold of 10 in one million. Even though the calculated point of maximum impact or

5 Although Project construction is expected to last only 29 months, a rolling 3-year (i.e., 36-month) period was conservatively used for determining cancer risks.

PMI (i.e. 31.7 in one million) is higher than the threshold, it is on the property boundaries of the project where there are no residences, farm workers or members of the public.

The PMI is used as a screening purpose. Since the cancer risk at PMI is above the threshold, the excess cancer risk at the MEIW (which is at the same location of PMI) is considered. The off-site worker is assumed to be exposed at the work location eight hours per day (starting at age 16 years old), instead of 24; 250 days per year, instead of 365; and for 25 years, instead of 30, as recommended in the OEHHA guidance (OEHHA 2015). According to **Table 5.10-2**, MEIW is 0.73 in one million, below the threshold of 10 in one million. Also, the risk numbers of MEIR and Maximally Exposed Sensitive Receptor are less than the threshold of 10 in one million. Therefore, staff concludes that there is no significant cancer health risk from the toxic air emissions from construction activities.

The predicted chronic health index at the PMI, MEIR, MEIW and Maximally Exposed Sensitive Receptor are 0.02, 0.0005, 0.02 and 0.0005, respectively. The chronic hazard indices for diesel exhaust during construction activities are all lower than the significance level of 1.0. This means that there would be no chronic non-cancer impacts expected from construction activities.

Valley Fever

Construction could disturb a certain percentage of approximately 3 acres of top soil that could harbor the *Coccidioides* spores, possibly exposing humans to the risk of Valley Fever. On-site and off-site workers, visitors and nearby residents could be exposed from inhaling these fungal spores from wind-blown dust generated from soil excavation work. However, as mentioned above, Imperial County has lower rates of reported cases of valley fever compared to other areas in California and is in a suspected endemic area (CDC 2012 and ICPHD 2013).

To minimize the risk of getting Valley Fever, Center for Disease Control and Prevention (CDC) recommends the following measures (CDC 2020a):

- Try to avoid areas with a lot of dust like construction or excavation sites.
- If can't avoid these areas, wear an N95 respirator.
- Stay inside during dust storms and close your windows.
- Avoid activities that involve close contact to dirt or dust, including yard work, gardening, and digging.
- Use air filtration measures indoors.

The California Department of Public Health (CDPH) also recommends:

- Avoid dust in places where Valley fever is common (where Valley fever rates are high):
    - Stay inside and keep windows and doors closed when it is windy outside and the air is dusty, especially during dust storms.

- Consider avoiding outdoor activities that involve close contact to dirt or dust, including yard work, gardening, and digging, especially if you are in one of the groups at higher risk for severe or disseminated Valley fever.
- Cover open dirt areas around your home with grass, plants, or other ground cover to help reduce dusty, open areas.
- While driving in these areas, keep car windows closed and use recirculating air, if available.
- Try to avoid dusty areas, like construction or excavation sites.
- If cannot avoid these areas, or must be outdoors in dusty air, consider wearing an N95 respirator to help protect against breathing in dust that can cause Valley fever.

- When digging in dirt or stirring up dust in areas where Valley fever is common:
  - Stay upwind of the area where dirt is being disturbed.
  - Wet down soil before digging or disturbing dirt to reduce dust.
  - Consider wearing an N95 respirator (mask).
  - After returning indoors, change out of clothes if covered with dirt.
    - Be careful not to shake out clothing and breathe in the dust before washing. If someone else is washing your clothes, warn the person before they handle the clothes.

Based on CDC and CDPH's recommendations, staff recommends that project workers in the vicinity of any project's dust generation areas wet the soil before any excavation activities if they have any concern of Valley Fever. Such workers could also wear protective masks and stay indoors during dust storms and close all doors and windows to avoid dust inhalation. Staff also considers the fugitive dust control measures for construction discussed in the **Air Quality** section and required under Conditions of Certification, **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement) adequate to minimize the risk of workers getting exposed to Valley Fever in areas where *Coccidioides* spores may be found.

As for the individuals away from the project site, the potential Valley Fever risk to stems from the potential of the spores of the Valley Fever fungus to be released into the air as a result of grading and excavating activities during construction. Because the spores disperse similarly to dust, mitigation measures used to control dust would be effective to control spore dispersal. Public exposure to spores would be reduced through the applicant's compliance with specific mitigation measures, including **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement) for the purposes of preventing all fugitive dust plumes, including spores, from leaving the project boundary. Keeping the dust plumes within the project boundary would limit potential for exposure to Valley Fever to adjacent residents, farm workers, and members of the public traveling or recreating in proximity to the proposed project.

Therefore, considering relative lower rates and reported cases of valley fever compared to other areas in California, along with the Air Quality mitigation measures, staff concludes that Valley Fever would not be a major concern for the proposed project for either the workers or the public.

Operation

Less Than Significant with Mitigation Incorporated. The applicant conducted HRA for the cancer and non-cancer chronic risk based on the following scenarios (Jacobs 2023ii, pg. 5.9-5):

- Routine operation of the cooling tower (CT), sparger, and biological oxidation box, including startups and shutdowns, as well as operation of the production testing unit (PTU) and rock muffler (RM).
- Routine operation of the cooling tower, sparger, and biological oxidation box assuming no facility downtime and 8,760 hours of continuous power generation. For this scenario, operation of the PTU and RM is not required since power generation is continuous.

The applicant conducted HRA for the non-cancer acute risk based on the following scenarios (Jacobs 2023ii, pg. 5.9-5):

- Routine operation of the cooling tower, sparger, and biological oxidation box. This is because emissions resulting from the PTU, RM, mobile testing unit (MTU), and cooling tower/sparger/biological oxidation box bypass/breakdown operations are limited, infrequent, and not to occur in the same hour as routine operation of the cooling tower, sparger, and biological oxidation box.
- Combustion emissions from the diesel fire water pump and three diesel-fired emergency generators, as well as emissions from the HCl scrubber, are also included in this scenario.
- Operation of the MTU. Although the MTU would only operate during the once-in-a-lifetime commissioning phase in the first year of operation and at varying offsite locations, the MTU would be operated for more hours in that first year than the PTU in subsequent years. As a result, the CEC staff requested that worst-case health risks from the MTU alone be estimated. Because the MTU would operate as other project features are brought online, no other geothermal brine flashing activities, HCl scrubber activities, or diesel combustion activities would occur in the same hour.

As discussed in more detail below, staff supplemented the acute risk analysis by showing the worst-case impacts resulting from the PTU and RM operations during startups and shutdowns.

Emission Sources

The emissions sources of TAC associated with the above scenarios include fire pump, HCL scrubber, 3.25MW generator, PTU, RM, CT, and MTU (Jacobs 2023ii, Table 5.9-4, Table 5.9-5 and Table 5.9-6). Emissions resulting from operation and maintenance (O&M)

activities, including construction vehicles and equipment, were not included in the HRA. These vehicles and equipment operate in limited capacity throughout the year in varying locations throughout or near the plant site. As such, they are not expected to significantly contribute to long-term health risk impacts (Jacob 2023ii, pg. 5.9-5).

Pollutants that could potentially be emitted during operation are listed in **Table 5.10-3,** including both criteria and non-criteria pollutants. Criteria pollutant emissions and impacts are examined in staff's **Air Quality** section.

In Table 5.9-2 of the AFC (Jacobs 2023ii), the applicant lists the specific TACs that would potentially be emitted to the air by the proposed project. The TAC emission estimated are presented in Table 5.9-4, Table 5.9-5, and Table 5.9-6 (Jacobs 2023ii). Details of the project's emission sources are discussed in staff's **Air Quality** section.

Moreover, since the PGF includes one cooling tower, there would be emissions of toxic metals, VOCs or Legionella bacterium from cooling tower mist or drift. Therefore, there would also be health risk from the potential presence of the Legionella bacterium responsible for Legionnaires' disease.

TABLE 5.10-3 POTENTIALLY EMITTED POLLUTANTS

Criteria Pollutants	**Non-criteria Pollutants/Toxic Air Contaminants [a, b]**		
Oxides of nitrogen NOx	Lead	Diesel Particulate Matter	Acrolein
Carbon monoxide CO	Hydrogen sulfide	(DPM)	Benzene
Volatile Organic Compounds	(H2S)	Radon [c]	Ethylbenzene
(VOCs)	Ammonia (NH3)	Copper (Cu)	Formaldehyde
Sulfur Oxides (SO_X)	Arsenic (As)	Manganese (Mn)	Naphthalene
Particulate matter (PM10	Mercury (Hg)	Nickel (Ni)	Propylene
and PM2.5)	Aluminum (Al)	Selenium (Se)	Toluene
Hydrogen sulfide (H_2S)	Antimony (Sb)	Silica (Si)	Xylene
Lead	Barium (Ba)	Silver (Ag)	Carbon dioxide (CO2)
	Beryllium (Be)	Vanadium (V)	Methane (CH4)
	Cadmium (Cd)	PAHs (excluding	Nitrous oxide (N2O)
	Chromium (Cr)	naphthalene) [d]	HCl
	Cobalt (Co)	Acetaldehyde	
	Zinc (Zn)	1,3-Butadiene	

Note:
[a] Although the Project is also expected to emit argon, hydrogen, lithium, nitrogen, and strontium, they are not classified as TACs by OEHHA and CARB and have not been included in this analysis.
[b] Although CO_2, CH_4, and N_2O are classified as greenhouse gases, OEHHA and CARB have assigned health risk values for them.
[c] Radon is managed as a radiation health hazard under other programs, it has not been identified as a TAC in California. An outcome of not being a TAC is that there are no HRA methods in OEHHA guidelines for assessing radon emissions to ambient air. Although radon is not a TAC and therefore not included in HRA, the applicant modeled radon concentration from the project's cooling tower at the MEIR, and showed is well within existing (background) levels of radon in air in California. Therefore, radon emissions from the proposed project do not represent an increased health risk (Jacobs 2024v).
[d] PAHs = polynuclear (or polycyclic) aromatic hydrocarbons
Source: Jacobs 2023ii, Table 5.1-8 and Table 5.9-2.

Hazard Identification

Numerous health effects have been linked to exposure to TACs, including development of asthma, heart disease, Sudden Infant Death Syndrome (SIDS), respiratory infections in children, lung cancer, and breast cancer (OEHHA, 2003). According to the AFC, the potential TACs emitted from the project are listed on **Public Health Table 3**.

Exposure Assessment

Air would be the dominant pathway for public exposure to chemical substances released by project operation. Potential health risks from public exposure to combustion emissions and geothermal fluid-related emissions were assessed by conducting a HRA. Although exposure would occur almost entirely by direct inhalation, additional pathways were conservatively included in the HRA. The HRA was conducted in accordance with guidance established by OEHHA and CARB (Jacobs 2023ii, pg. 5.9-1).

The applicable exposure pathways for the toxic emissions include inhalation, soil ingestion, dermal (through the skin) absorption, mother's milk, home-grown produce, beef/dairy ingestion, and pig/chicken/egg ingestion (Jacobs 2023ii, Table 5.9-8). This method of assessing health effects is consistent with OEHHA's Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA 2003) referred to earlier.

The health risk from exposure to each project-related pollutant is assessed using the "worst case" emission rates and impacts. Maximum hourly emissions are used to calculate acute (one-hour) noncancer health effects, while estimates of maximum emissions on an annual basis are used to calculate cancer and other chronic (long-term) health effects.

The next step in the assessment process is to estimate the project's incremental concentrations using a screening air dispersion model and assuming conditions that would result in maximum impacts. Concentrations of these pollutants in air potentially associated with the project were estimated using the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) dispersion modeling program. Modeling allows the estimation of both short-term and long-term average concentrations in air for use in an HRA, accounting for site-specific terrain and meteorological conditions (Jacobs 2023ii, pg. 5.9-11).

Dose-Response Assessment

The dose-response assessment was based on toxicity values including the cancer potency factor and RELs to quantify the cancer and noncancer health risks from the project's combustion-related pollutants. The toxicity values were obtained from the OEHHA's Guidelines (OEHHA 2015) and OEHHA/ARB Consolidation Table of OEHHA/ARB Approved Risk Assessment Health Values (CARB 2023b) (Jacobs 2023ii, pg. 5.9-12). RELs are used to calculate short-term and long-term noncancer health effects, while the cancer potency factors are used to calculate the lifetime risk of developing cancer. These toxicity values are predefined in Hotspots Analysis and Reporting Program model, Version 2 (HARP2).

Characterization of Risks from TACs

As described above, the last step in an HRA is to integrate the health effects and public exposure information, provide quantitative estimates of health risks resulting from project emissions, and then characterize potential health risks by comparing worst-case exposure to safe standards based on known health effects.

Emissions of toxic pollutants potentially associated with operations of the project were estimated using emission factors approved by CARB and the U.S. Environmental Protection Agency (EPA) or representative analytical data from other geothermal power plants in the area, as detailed in staff's **Air Quality** section (Jacobs 2023ii, pg. 5.9-11). TAC emissions were estimated based upon AP-42 methodology (EPA 1996) (Jacobs 2023ii, pg. 5.1-18). With AERMOD, air dispersion modeling combined the emissions with site-specific terrain and meteorological conditions to analyze the mean short-term and long-term ground-level concentrations in air for use in the HRA. Ground-level concentrations were then used in conjunction with cancer unit risk factors and RELs to estimate the cancer and noncancer risks from operations.

Risk characterization from toxics emitted by the facility was carried out according to the procedures specified by OEHHA guidance for both carcinogenic and non-carcinogenic risks (OEHHA 2015). As recommended by the 2015 OEHHA Guidance, a Tier 1 assessment was performed. The Tier 1 assessment is the most conservative of the four tier assessment methodologies identified in the OEHHA guidance and uses a standard point-estimate approach with standard OEHHA assumptions. Residential and sensitive cancer risks were evaluated using the 30-year continuous exposure duration scenario and worker cancer risk was evaluated using the 25-year exposure duration (8 hours per day starting at age 16 years old), as recommended in the OEHHA guidance (OEHHA 2015). Based on the OEHHA guidance, the derived (adjusted) method in HARP2 was used for the cancer risk evaluation, which uses the 95th percentile breathing rate from the third trimester to 2 years and the 80th percentile inhalation rate from 2 years to 70 years for residential cancer risk assessments (CARB 2015). The 30-year and 25-year exposure durations for residential and commercial/industrial receptors, respectively, are obtained from the OEHHA guidance (OEHHA 2015) (Jacobs 2023ii, pg. 5.9-12).

The HRA was conducted for the general population, nearby residences, off-site workers and sensitive receptors. Staff only evaluates the health impact on off-site workers because on-site workers are protected by Cal OSHA and are not required to be evaluated under the Hot Spots Program, unless the worker also lives on the facility site or property. The sensitive receptors, as previously noted, are subgroups that would be at greater risk from exposure to emitted air toxics, and include the very young, the elderly, and those with existing illnesses.

Health risks potentially associated with ambient concentrations of carcinogenic pollutants were calculated in terms of excess lifetime cancer risks. The incremental lifetime cancer risk for a pollutant is estimated based on the concentration in air, breathing rates of the exposed person, inhalation cancer potency, oral slope factor, frequency and duration of

exposure at the receptor, and age sensitivity factor (Jacobs 2023ii, pg. 5.9-11). The total cancer risk at any specific location is found by summing the contributions from the individual carcinogens.

Evaluation of potential non-cancer health risks from exposure to short-term and long-term concentrations in the air was performed by comparing modeled concentrations in air with the RELs. An REL is a concentration in the air at or below which no adverse health effects are anticipated. RELs are based on the most sensitive adverse effects reported in the medical and toxicological literature. Potential non-cancer effects were evaluated by calculating a ratio of the modeled concentration in the air and the REL to develop the HQ (Jacobs 2023ii, pg. 5.9-11 and 5.9-12). Health risks from non-cancer health effects were then calculated in terms of HI as a sum of HQs.

In the following sub-sections, staff reviews and summarizes the work of the applicant. Staff also conducted its HRA for acute HI. Although the applicant conducted its HRA according to three different scenarios as mentioned above, staff only reported and discussed the results of the highest values.

Cancer Risk

Cancer Risk at the Point of Maximum Impact (PMI)

The most significant result of HRA is the numerical cancer risk at the point of maximum impact (PMI) and risks at a residence (MEIR). As previously noted, human health risks associated with emissions from the proposed project are unlikely to be higher at any other location than at the PMI. Therefore, if there is no significant impact associated with concentrations at the PMI location, it can be reasonably assumed that there would not be significant impacts in any other location in the project area.

The PMI is not necessarily associated with actual exposure because in many cases, the PMI is in an uninhabited area. Therefore, the PMI is generally higher than the maximum residential cancer risk. PMI is based on 24 hours per day, 365 days per year, 30-year lifetime exposure. The potential exposure level for off-site nonresidential workers and those involved in recreational activities would thus be less. As shown in **Table 5.10-4**, total worst-case individual cancer risk is 20.4 in one million at the PMI. The PMI for impacts from operation is on the east boundary of the project. The cancer risk value at PMI is above the significance level, ten in one million, indicating that significant adverse cancer risk is expected.

Cancer Risk at Area Residences

Staff's specific interest in the risk to the maximally exposed individual is in a residential setting (MEIR). That is because this risk most closely represents the maximum project-related lifetime cancer risk. Residential risk is presently assumed by the regulatory agencies to result from exposure lasting 24 hours per day, 365 days per year, over a 30-year lifetime. As shown in **Table 5.10-4,** the cancer risk for the MEIR is 0.48, which is below the significance level. It indicates that significant adverse cancer risk at MEIR is

not expected.

Cancer Risk of Workers

As indicated above, the PMI is used as a screening purpose. Since the cancer risk at PMI is above the threshold, the excess cancer risk at the MEIW (which is at the same location of PMI) is considered. The cancer risk to potentially exposed both project and offsite nonresidential workers was presented in terms of risk to the maximally exposed individual worker (or MEIW at PMI) and is summarized in **Table 5.10-4**. For all non-cancer MEIW locations, the MEIW is assumed equal to the PMI (Jacobs 2023rr, Table 6). The worker is assumed to be exposed at the work location 8 hours per day (starting at age 16 years old), instead of 24; 250 days per year, instead of 365; and for 25 years, instead of 30, as recommended in the OEHHA guidance (OEHHA 2015). As shown in **Table 5.10-4**, the cancer risk for workers at MEIW (i.e. 0.88 in one million) is below the significance level. It indicates that significant adverse cancer risk at MEIW is not expected.

Cancer Risk of Sensitive Receptors

There are no nearby sensitive receptors, so the applicant conservatively assumes all nearby residences are potential sensitive receptors (Jacobs 2023rr, Table 6). It is below the significance level meaning that significant adverse cancer risk at this nearest sensitive receptor is not expected.

As shown in **Table 5.10-4,** predicted facility-wide impacts are below the cancer risk threshold of 10 in one million at all locations except the PMI. Although the risk levels at PMI are greater than the SCAQMD's "significant health risk" threshold, its location represents the maximum possible cancer risk outside of the facility boundary. The PMI does not constitute a location that would present a potential for long-term exposure as it is typically along the project fence line. Health risks associated with operational emissions from the project are unlikely to be higher at any location other than that of the PMI. In reality, cancer risks are expected to be much less in locations where long-term exposure is more likely to occur, such as at the locations of the MEIR, MEIW, and maximally exposed sensitive receptor. Cancer risks at these locations are 0.48, 0.88, and 0.48 in one million, respectively, which are all less than the significance threshold.

The applicant also provided a map containing cancer risk isopleths. including the ones showing the risk values of 1, 5, and 10 in one million (Jacobs 2023ii, Figure 5.9-2). According to the map, the isopleth of 10 in one million is only a small area east of the project boundary. There is neither residential receptors nor sensitive receptors within the isopleths of 10 in one million. Therefore, staff believe there is no public health concern of cancer risk from the TAC emissions from the project operation.

TABLE 5.10-4 OPERATION – MODELED RECEPTOR MAXIMUM HEALTH RISK: CANCER RISK IMPACT (IN ONE MILLION) AND CHRONIC NON-CANCER HAZARD INDEX (HI) (UNITLESS)

Receptor Type	Cancer Risk Impact (in one million)	Chronic Non-Cancer Hazard Index (HI) (unitless)
PMI[1]	**20.4[5]**	**1.41[5]**
MEIR[2]	0.48	0.03
MEIW[3]	0.88	**1.41[5]**
Maximally Exposed Sensitive Receptor[4]	0.48	0.03
SCAQMD Threshold	10	1

Notes:
[1] Point of maximum impact (PMI). It is right on the east of project fence line.
[2] Maximally exposed individual resident (MEIR). It is approximately 3.5 miles east of the project boundary.
[3] Maximally exposed individual worker (MEIW). It is located at the same location of PMI. Risks at the worker receptors include a Worker Adjustment Factor of 4.2 (7/5*24/8) to account for the hours a worker is present at a site.
[4] It is at the same location of MEIR.
[5] The scenario of facility wide impacts: routine operation year without startups and shutdowns. It is at the same location of PMI (right on the east of project fence line).
Source: Jacobs 2023ii, Table 5.9-9 and Table 5.9-10, Jacobs 2023rr, Table 6 and HRA modeling files provided by the applicant, ICAPCD 2024c, Table 11

Chronic Hazard Index (HI)

According to **Table 5.10-4**, the results of the applicant's HRA show that some Chronic HIs exceed the thresholds of one (i.e. PMI and MEIW). Staff checked the HRA modeling files provided by the applicant and found the predominant TACs for chronic HI are arsenic.

PMI and MEIW is right on the east of project fence line. There would be neither residence nor off-site worker in this hypothetical receptor. It was conservatively assumed that most receptors within the receptor grid could represent a worker location (Jacobs 2023ii, pg. 5.9-13).

The HIs of MEIR and Maximally Exposed Sensitive Receptor is 0.03, lower than the threshold of 1. In reality, HIs expected to be much less in locations where long-term exposure is more likely to occur, such as at the locations of the MEIR and maximally exposed sensitive receptor. HI at these locations is 0.03, which is less than the significance threshold.

The applicant also stated that "…chronic risk is less than 1.0 at the MEIR and Maximum Exposed Sensitive Receptor, with risks greater than 1.0 limited to 400-feet of the facility's eastern fence line. Although technically not within the project property, it is not expected to be a location presenting a potential for long-term or chronic exposure because public access to this land is restricted through its ownership by BHE Renewables, LLC (Jacobs 2024v)."

Therefore, staff believe there is no public health concern of chronic HIs from the TAC emissions from the project operation.

Acute Hazard Index (HI)

According to **Table 5.10-5**, the results of the applicant's HRA show that some Acute HIs exceed the thresholds of one. Staff checked the HRA for acute impacts and found that the predominant TACs for acute HI is H_2S. Staff also found that the applicant applicant's acute HI of 2.46 at MEIW/PMI was based on outdated H_2S emission rates for the routine operation of the cooling tower filed to the docket with the original AFC (Jacobs 2023d). In November 2023, the applicant submitted revised Data Response Set 1 (Jacobs 2023ii), which included reduced H2S emissions. However, the applicant did not update the acute HRA accordingly. Therefore, staff considers the applicant's acute HI analysis overly conservatively by using the outdated higher H2S emission rates. Staff performed a revised acute HRA of the cooling tower during routine operations and the acute HI at MEIW/PMI would be 0.89 (below the threshold of 1.0), as shown in **Table 5.10-5**.

In the Revised AFC Section 5.9 (Jacobs 2023ii, pg. 5.9-5), the applicant stated that the acute risk analysis for the cooling tower was based on routine operation of the cooling tower, sparger, and biological oxidation box. The applicant stated that emissions resulting from the PTU, RM, mobile testing unit (MTU), and cooling tower/sparger/biological oxidation box bypass/breakdown operations are limited, infrequent, and not to occur in the same hour as routine operation of the cooling tower, sparger, and biological oxidation box.

Staff agrees that the sparger and biological oxidation box bypass operations are only expected to occur during breakdown scenarios in which the associated control equipment is not properly functioning. Although these breakdown scenarios are possible, they are not considered reasonably foreseeable. Furthermore, these breakdown operations would be limited in duration by ICAPCD Rule 111, which provides that breakdown conditions must be remedied within 24 hours of the event. If not remedied within that time, the facility must be shut down. Therefore, staff concludes that assessing the short-term (acute) impacts of the sparger and biological oxidation box bypass operations would be speculative due to the infrequent, irregular, and unplanned nature of such operations. The sparger and biological oxidation box bypass operations would be unlikely to expose sensitive receptors to substantial concentrations of TACs.

On the other hand, staff considers the PTU and RM operations during commissioning, startups, and shutdowns to be more reasonably foreseeable than the sparger and biological oxidation box bypass operations. Staff performed an independent analysis of the acute impacts of the PTU and RM operations. In addition, per CEC staff request, the applicant analyzed the health risks from the MTU operations during commissioning. For the MTU operations, the acute HI is 3.53 for the PMI and MEIW, which is mainly due to H_2S impacts (Jacobs 2023ii, Table 5.9-10 and ICAPCD 2024c, Table 11).

As discussed in **Section 5.1 Air Quality** and presented in **Air Quality Table 5.1-13**, staff found that 1-hour H_2S CAAQS of 42 $\mu g/m^3$ may be exceeded by PTU, RM during startups and shutdowns, and MTU operations during commissioning. Since the dominant TACs for acute HI is H_2S, staff converted the H_2S results of **Air Quality Table 5.1-13**

to acute HI and presented them in **Public Health Table 5.10-5**. For comparison purposes, staff presents both the acute HI results from the applicant and from staff's independent analysis in **Table 5.10-5**.

TABLE 5.10-5 OPERATION – MODELED RECEPTOR MAXIMUM HEALTH RISK: ACUTE NON-CANCER HAZARD INDEX (HI) (UNITLESS)

Emission Source	PMI[4]		MEIR		MEIW	Maximally Exposed Sensitive Receptor
	The Applicant	Staff	The Applicant	Staff	The Applicant	The Applicant
Routine Operations	**2.46**	0.89	0.4	0.15	**2.46**	0.4
PTU[1]	**-**	**3.69**	-	0.27	-	-
RM[2]	**-**	**9.20**	-	0.95	-	-
MTU[3]	**3.54**	**3.53**	0.62	0.62	**3.54**	0.62

Note:
[1] PTU - Production Testing Unit.
[2] RM - Rock Muffler.
[3] MTU - Mobile testing unit. The scenario of MTU impacts: commissioning year.
[4] The PMI for the routine operations and RM is located on the south side of the project boundary. The PMI for PTU is located on the north side of the project boundary. The PMI for MTU is located about 670 feet north of the project boundary.
Sources: Air Quality Table 5.1-13 and CEC staff analysis

Table 5.10-5 shows that according to staff's analysis, the acute HI at PMI (i.e. 3.53) would exceed 1.0 by the MTU operations during commissioning and by non-routine PTU (i.e. 3.69) and RM (i.e. 9.2) operations during startups and shutdowns if they would occur during worst-case meteorological conditions. However, there is a low probability that a single person would be within the area with modeled acute HI exceedance during these operations and coincident worst-case meteorological conditions. **Table 5.10-5** also shows that the acute HI at MEIR would not exceed 1.0, indicating that no short-term adverse health effects are expected at these residences due to MTU, PTU, and RM operations.

The acute HIs of MEIW also exceed the threshold of 1.0 but MEIW is assumed to be at the same location of PMI, not a real location of an off-site worker. As mentioned above, it was conservatively assumed that most receptors within the receptor grid could represent a worker location (Jacobs 2023ii, pg. 5.9-13). Also, the calculation of HI is simply the concentration divided by the reference level, so the exposure period is not able to be adjusted for the HI of MEIW.

Moreover, it should be noted that the acute HI exceedance was mainly due to the H_2S impacts exceeding the H_2S acute REL of 42 µg/m^3, which is equivalent to the nuisance based CAAQS for odor control. As discussed in more detail in **Section 5.1 Air Quality**, if the H_2S standard were based on adverse health effects, it would be set at a much higher level. For example, the Occupational Safety and Health Administration (OSHA) set an acceptable ceiling limit of 28,000 µg/m^3 (or 20 ppm) for H_2S in workplace air. The National Institute for Occupational Safety and Health (NIOSH) recommends a 10-minute

ceiling limit of 14,000 µg/m^3 (or 10 ppm). Therefore, any temporary H_2S exceedances above the CAAQS (i.e. acute REL) would be characterized as a nuisance rather than an issue of public health.

As discussed in **Section 5.1 Air Quality**, there would be low potential for nuisance conditions to occur near the project site during commissioning, startups, and shutdowns. Moreover, as described in Section 5.9.6 of the AFC, emission control technologies for key TACs would be installed as part of the project; these technologies would reduce TAC emissions to the extent technically feasible and are expected to meet the definition and requirements for TBACT. Therefore, the potential health risk impacts from operation are expected to be less than significant (Jacobs 2023ii, pg. 5.9-16, 5.9-23 and 5.9-24). Also, since the applicant owns the land on which the hazard indices are being exceeded, they would restrict public access to those areas and comply with the public notification requirements for the project's acute risks (Jacobs 2024u).

Cancer Burden

In addition to estimating individual cancer risk at specific points, OEHHA recommends determining the number of people who reside within the 1 x 10^{-6}, 1 x 10^{-5}, 1x 10^{-4}, and higher cancer risk isopleths. The HARP software can provide population exposure estimates as cancer burden or as the number of persons exposed to a selected (user identified) health risk/impact level (OEHHA 2015, pg. 4-15).

Cancer burden is calculated on the basis of OEHHA (70-year) risks and is independent of how many people move in or out of the vicinity of an individual facility. For example, if 10,000 people are exposed to a carcinogen at a concentration with a 1x10^{-5} cancer risk for a lifetime, the cancer burden is 0.1, and if 100,000 people are exposed to a 1×10^{-5} risk, the cancer burden is 1 impact (Jacobs 2023ii, pg. 5.9-13).

Staff conducted an independent and conservative calculation for cancer burden. The area with a carcinogenic risk above 1-in-one-million is in Census Tract 06025010102 with total population of 4,108[6]. Cancer burden is then calculated as the maximum product of the highest carcinogenic risk of this census block (i.e., 14.6 in one million on the basis of OEHHA [70-year] risks) and the number of individuals in this census block (i.e. 4,108), and the result is 0.06. Therefore, the cancer burden from the proposed project is estimated to be less than the SCAQMD's significance threshold value of 0.5. The methods used in this calculation considerably overstate the potential cancer burden, further suggesting that project emissions are unlikely to represent a significant public health effect in terms of cancer risk.

6 Staff obtained the population information of census tract for CalEnviroScreen 4.0: https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40

Legionella from Cooling Tower Operation

In addition to being a source of potential TACs, the possibility exists for bacterial growth to occur in cooling tower cells, including Legionella. Legionella is a bacterium that is ubiquitous in natural aquatic environments and is also widely distributed in man-made water systems. It is the principal cause of legionellosis, otherwise known as Legionnaires' disease, similar to pneumonia. Transmission to people results mainly from inhalation or aspiration of aerosolized contaminated water. Untreated or inadequately treated cooling systems, such as industrial cooling tower cells and building heating, ventilating, and air conditioning systems, have been correlated with outbreaks of legionellosis (Jacobs 2023ii, pg. 5.9-22 and 5.9-23).

The State of California regulates recycled water for use in cooling tower cells in California Code of Regulations, title 22, Section 60306. This section requires that, to protect workers and the public who may come into contact with cooling tower mists, chlorine or another biocide must be used to treat the cooling system water to minimize the growth of Legionella and other micro-organisms. This regulation does not apply to the project since it does not intend to use reclaimed water for cooling purposes (Jacobs 2023ii, pg. 5.9-23).

Cooling tower cells (14 total) are proposed in the proposed project. The cooling tower would be equipped with high efficiency cellular type drift eliminators designed to limit drift losses to at or below 0.0005% of the recirculation rate (Jacobs 2023ii, 5.1-30 and ICAPCD 2024c, pg. 7). Also, in order to ensure that Legionella growth is kept to a minimum, thereby protecting both nearby workers as well as members of the public, an appropriate biocide program and anti-biofilm agent monitoring program would be prepared and implemented for the cooling tower cells associated with the project. These programs would ensure that proper levels of biocide and other agents are constantly maintained within wet cooling tower water, that periodic measurements of Legionella levels are conducted, and that periodic cleaning is conducted to remove bio-film buildup (Jacobs 2023ii, pg. 5.9-23).

To ensure that the potential for bacterial growth in all 14 cooling tower cells is kept to a minimum and decrease the exposure to Legionella, staff proposes the condition of certification **PUBLIC HEALTH-1. PUBLIC HEALTH-1** is proposed to require the cooling tower cells to implement aggressive water treatment and biocide application programs.

5.10.2.3 Cumulative Impacts

Less Than Significant. A project would result in a significant adverse cumulative impact if its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (Cal. Code Regs., tit. 14, § 15130). As for cumulative impacts for cumulative hazards and health risks, if the implementation of the proposed project, as well as the past, present, and probable future projects, would not cumulatively

contribute to regional hazards, then it could be considered a less than cumulatively considerable impact.

As mentioned above, according to **Section 1 Executive Summary, Table 1-2** and AFC, the existing, approved, pending and proposed projects within six miles include:

- Elmore North (1.3 miles SW of the project)
- JJ Elmore Power Plant (1.3 miles SW of the project)
- Black Rock (3 miles SW of the project)
- Energy Source Mineral ATLIS Project (0.1 miles east of the project)
- Hudson Ranch Power 1 Plan (0.3 miles east of the project)
- Geo Hudson Ranch (0.6 miles east of the project)
- Hell's Kitchen (1.2 miles north of the project)
- Midway IV (4.5 miles southeast of the project)
- Wilkinson solar farm (5.8 miles southeast of the project)

As discussed above, the health impacts from project operation would be less than significant with mitigation incorporated. The maximum cancer risk and non-cancer hazard index (both acute and chronic) of operations emissions from the project for the MEIR and maximally exposed sensitive receptor are all below levels of corresponding significance. While air quality cumulative impacts could occur with sources within a six-mile radius, cumulative public health impacts are usually not significant unless the emitting sources are extremely close to each other, within a few blocks, not miles. CEC staff, therefore, concludes that the proposed project, even when combined with these projects, would not contribute to cumulative impacts in the area of public health.

5.10.3 Applicable LORS and Project Conformance

Staff has conducted a HRA for the proposed MBGP and found no potentially significant adverse impacts for any receptors, including sensitive receptors. In arriving at this conclusion, staff notes that its analysis complies with all directives and guidelines from the Cal/EPA OEHHA and CARB. Staff's assessment is biased towards protection of public health and takes into account the most sensitive individuals in the population. Using extremely conservative (health-protective) exposure and toxicity assumptions, staff's analysis demonstrates that members of the public potentially exposed to toxic air contaminant emissions of this project, including sensitive receptors such as the elderly, infants, and people with pre-existing medical conditions, would not experience any acute or chronic significant health risk or any significant cancer risk from that exposure.

Staff incorporated every conservative assumption called for by state and federal agencies responsible for establishing methods for analyzing public health impacts. The results of that analysis indicate that there would be no direct or cumulative significant public health impact on any population in the area. Therefore, staff concludes that construction and

operation of the project would comply with all applicable LORS regarding long-term and short-term project impacts in the area of public health.

Table 5.10-6 staff's determination of conformance with applicable local, state and federal LORS, including any proposed Conditions of Certification, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific conditions of certification, the proposed project would comply with applicable LORS. The subsection below, "Staff Proposed Conditions of Certification," contains the full text of the referenced conditions of certification.

TABLE 5.10-6 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Compliance and Basis for Compliance
Federal	
Clean Air Act section 112 (Title 42, U.S. Code section 7412) (National Emission Standards for Hazardous Air Pollutants [NESHAP)).	**Yes**. Based on the HRA results, the project's cancer and chronic health risks do not exceed acceptable levels. Although acute health risks may potentially exceed acceptable levels, they would be minimized to the extent technically feasible through the use of TBACT. The facility would comply with applicable federal, state, and ICAPCD rules and regulations.
National Emission Standards for Hazardous Air Pollutants (NESHAP) Subpart ZZZZ—National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.	**Yes.** The gensets would comply with NESHAP Subpart ZZZZ by complying with the requirements of NSPS Subpart IIII. The project would include three diesel-fired emergency generators and one diesel fire pump which are subject to operations, maintenance, and emissions requirements of NSPS Subpart IIII. The project's diesel engines would be operated and maintained as per the manufacturer specifications. The emergency generators would be Tier 4 compliant, meaning their emissions would not exceed any of the emission limitations of this subpart. The fire pump would be Tier compliant and would be certified to emission rates that meet the requirements of both subparts.
State	
California Health and Safety Code section 41700	**Yes.** The CEC Conditions of Certification and the ICAPCD ATC processes are developed to ensure that no adverse public health effects or public nuisances result from operation of the project.
The Air Toxics "Hot Spots" Information and Assessment Act (Assembly Bill [AB] 2588, 1987, Connelly) or California Health and Safety Code sections 44330.	**Yes.** The project would participate in the AB 2588 inventory and reporting program, as required and implemented by ICAPCD. Based on the HRA results, the project's cancer and chronic health risks do not exceed acceptable levels. Although acute health risks may potentially exceed acceptable levels, they would be minimized to the extent technically feasible through the use of TBACT.
Local	
ICAPCD Rule 207, New and Modified Stationary Source Review	**Yes**. An Authority to Construct and Permit to Operate would be obtained from ICAPCD prior to construction and operation of the project, respectively. As a result, the project would comply with the ICAPCD's permitting requirements.

TABLE 5.10-6 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Compliance and Basis for Compliance**
ICAPCD Rule 216, Construction or Reconstruction of Major Stationary Sources That Emit Hazardous Air Pollutants	**Yes**. Emission control technologies for key TACs would be installed as part of the project; these technologies would reduce TAC emissions to the extent technically feasible and are expected to meet the definition and requirements for TBACT.
ICAPCD Rule 407, Nuisance	**Yes**. The project would obtain an ATC and PTO from ICAPCD which would confirm project operations do not cause public nuisance.
ICAPCD Rule 1001, National Emission Standards for Hazardous Air Pollutants (NESHAPS)	**Yes.** The project is not subject to Rule 1001 as there are no applicable 40 CFR Part 61 subparts listed in Rule 1001, Section D.
ICAPCD Rule 1002, California Airborne Toxic Control Measures (ATCMS)	**Yes.** The project would implement best management practices during construction, which would comply with all applicable construction-related ATCM provisions. The project operations would include stationary internal combustion engines which would be fired using ultra-low sulfur diesel with a sulfur content not to exceed 15 ppm by weight.
Rule 1003, Hexavalent Chromium Emissions from Cooling Tower.	**Yes.** The project would not use cooling tower circulating water with chromium containing compounds. Additionally, analytical data of the cooling tower condensate would be collected, as required by this rule, to ensure chromium levels do not exceed Rule 1003 levels of 0.15 milligrams per liter. A cooling tower compliance plan would also be submitted to the ICAPCD, as required, to ensure compliance with this rule.

5.10.4 Conclusions and Recommendations

As discussed above, with implementation of conditions of certification, the project would have a less than significant impact related to public health and would conform with applicable LORS. Staff recommends adopting the conditions of certification as detailed in subsection "5.10.5 Proposed Conditions of Certification" below.

5.10.5 Proposed Conditions of Certification

The following proposed conditions of certification include both measures to mitigate environmental impacts and ensure conformance with applicable LORS.

PUBLIC HEALTH-1 The project owner shall develop and implement a Cooling Water Management Plan to ensure that the potential for bacterial growth in all 14 cooling tower cells is kept to a minimum. The Plan shall be consistent with either staff's "Cooling Water Management Program Guidelines" or with the Cooling Technology Institute's "Best Practices for Control of Legionella" guidelines but in either case, the Plan must include sampling and testing for the presence of Legionella bacteria at least every six months. After two years of power plant operations, the project owner may ask the CPM to re-evaluate and revise the Legionella bacteria testing requirement.

Verification: At least 60 days prior to the commencement of cooling tower operations, the Cooling Water Management Plan shall be provided to the CPM for review and approval.

5.10.6 References

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5.11 Socioeconomics

Ellen LeFevre

5.11.1 Environmental Setting

This section describes the environmental setting and regulatory background and discusses the impacts associated with the construction and operation of the project with respect to the population and housing, public services, and recreation.

Existing Conditions

Population and Housing

The proposed Morton Bay Geothermal Project (MBGP or project) is within the Salton Sea Known Geothermal Resource Area in Imperial County. Nearby is the city of Calipatria and community of Niland. Approximately 80 percent of the construction workforce would be local to Imperial County and 20 percent would be non-local from nearby counties. The operation workforce would be drawn locally from Imperial County. CEC staff considers Imperial County the study area population and housing impacts and the El Centro Metropolitan Statistical Area (MSA) and the San Diego-Carlsbad MSA, which covers Imperial County and San Diego County as the study area for labor supply for the project.

Population Growth

Imperial County has an estimated land area of 4,175 square miles and a population of 179,702 people (Census 2020). The project would be located within the unincorporated area of Imperial County. The estimated population of unincorporated Imperial County is 33,833 (CA DOF 2023).

Table 5.11-1 shows the projected population growth projections for the city of Calipatria and Imperial County. Population projections between the years 2020 and 2045 show a growth range from 34 percent to 56 percent or 1.4 percent to 2.2 percent per year for Calipatria and Imperial County.

TABLE 5.11-1 HISTORICAL AND PROJECTED POPULATIONS

Area	2020	2045	Projected Population Change 2020-2045 Number	Projected Population Change 2020-2045 Percent	Projected Population Change 2020-2045 Percent per Year
Calipatria	7,247	9,700	2,453	34%	1.4%
Imperial County	180,051	281,000	100,949	56%	2.2%

Source: Census 2020, SCAG 2023

Housing

Table 5.11.2 presents the housing supply data for the project area. Year 2023 housing estimates indicate 4,777 vacant housing units within Imperial County and vacancy rates

ranging from 8.1 percent to 20.1 percent for the city of Calipatria, unincorporated Imperial County, and Imperial County (CA DOF 2023).

TABLE 5.11-2 HOUSING SUPPLY ESTIMATES IN THE PROJECT AREA

Housing Supply	2023 Total Number	2023 Vacant Number	2023 Vacant Percent
Calipatria	1,121	91	8.1%
Unincorporated Imperial County	12,450	2,602	20.1%
Imperial County	58,541	4,777	8.2%

Source: CA DOF 2023

There are hotel and motel accommodations as well as recreational vehicle (RV) parks and campgrounds in the surrounding area. The cities of Brawley, Calipatria, and Westmoreland have a combined total of 6 hotels and motels with approximately 398 rooms. Northeast of the project, near the community of Niland, are 3 RV parks and campgrounds with approximately 1,286 sites (Good Sam 2024).

The Southern California Association of Governments is responsible for allocating the housing production goals for cities and counties within its region, which includes Imperial County. The SCAG develops the Regional Housing Needs Assessment (RHNA) which quantifies the need for housing within each local agency during specified planning periods. For the 2021 to 2029 RHNA planning period, the unincorporated area of Imperial County would need to construct 4,301 housing units. (SCAG 2021)

Labor Supply

The project would be within the El Centro MSA (Imperial County). It is anticipated that most construction workers would commute to the project site from within Imperial County or the San Diego metropolitan area (Jacobs 2023a p. 5.10-9). The California Employment Development Department 2018-2028 Occupational Employment Projections for the project's construction are shown in **Table 5.11-3** and **5.11-4**.[1] The El Centro MSA (Imperial County) employment projections are provided in **Table 5.11-3** and the San Diego-Carlsbad MSA (San Diego County) employment projections are provided in **Table 5.11-4**.

Table 5.11-5 provides the project's operations occupations and the El Centro MSA (Imperial County) employment projections. It is anticipated that the occupation workers are from within Imperial County.

1 The workforce is considered local if the construction workforce resides within a two-hour commute of a project and the operations workforce resides within a one-hour commute (commute times are industry accepted assumptions).

TABLE 5.11-3 PROJECTED EMPLOYMENT GROWTH				
El Centro MSA (Imperial County)	**Year 2020**	**Year 2030**	**Annual Average Percent Change**	**Peak Construction Period (Month 19)**
Piling (6-person crew)[1]	220	250	13.6%	0 (24)
Carpenters	170	160	-5.9%	6 (24)
Laborers	410	460	12.2%	8 (16)
Teamsters	-	-	-	12
Electricians	140	160	14.3%	120
Ironworkers	-	-	-	0 (32)
Millwrights[2]	120	150	25%	24
Plumbers	100	120	20%	6 (12)
Pipefitters	100	120	20%	150
Insulation workers	-	-	-	80
Operating Engineers	220	250	13.6%	18
Oilers/Mechanics[2]	120	150	25%	4
Cement Finishers	70	60	-14.3%	0 (10)
Masons	-	-	-	0 (12)
Sheetrockers[3]	-	-	-	12
Roofers	-	-	-	0 (10)
Sheetmetal workers	-	-	-	14 (20)
Sprinkler fitters[4]	100	120	20%	12 (16)
Painters	50	60	20%	10 (20)
I&C Control Room	-	-	-	12
Cooling Tower Subcontract	-	-	-	24
Clarifier Subcontract	-	-	-	24
Supervisors	150	160	6.7%	24
Total Construction Staff	1,510	1,660	9.9%	560

Notes: - No data available; () Number in the parentheses represents peak number of workers in a given month for a specific trade type of construction. 1 Operating Engineers and Other Construction Equipment Operators; 2 Industrial Machinery Mechanics; 3 Installation, Maintenance, and Repair Workers, All Others; 4 Plumbers, Pipefitters, and Steamfitters. Source: Jacobs 2023a, CA EDD 2023

TABLE 5.11-4 PROJECTED EMPLOYMENT GROWTH

San Diego-Carlsbad MSA (San Diego County)	Year 2020	Year 2030	Annual Average Percent Change	Peak Construction Period (Month 19)
Piling (6-person crew)1	2,400	2,740	14.2%	0 (24)
Carpenters	11,260	13,060	16%	6 (24)
Laborers	11,320	13,990	23.6%	8 (16)
Teamsters	-	-	-	12
Electricians	7,450	9,080	21.9%	120
Ironworkers	730	870	19.2%	0 (32)
Millwrights	160	210	31.3%	24
Plumbers	4,900	5,720	16.7%	6 (12)
Pipefitters	4,900	5,720	16.7%	150
Insulation workers	200	240	20%	80
Operating Engineers	2,400	2,740	14.2%	18
Oilers/Mechanics2	1,750	2,210	26.3%	4
Cement Finishers	1,700	1,890	11.2%	0 (10)
Masons	240	260	8.3%	0 (12)
Sheetrockers3	2,450	2,870	17.1%	12
Roofers	2,210	2,610	18.1%	0 (10)
Sheetmetal workers	2,230	2,500	12.1%	14 (20)
Sprinkler fitters4	4,900	5,720	16.7%	12 (16)
Painters	6,500	7,710	18.6%	10 (20)
I&C Control Room	-	-	-	12
Cooling Tower Subcontract	-	-	-	24
Clarifier Subcontract	-	-	-	24
Supervisor	7,240	8,640	19.3%	24 (32)
Total Construction Staff	74,300	88,140	18.6%	560

Notes: - No data available; () Number in the parentheses represents peak number of workers in a given month for a specific trade type of construction. 1 Operating Engineers and Other Construction Equipment Operators; 2 Industrial Machinery Mechanics; 3 Installation, Maintenance, and Repair Workers, All Others; 4 Plumbers, Pipefitters, and Steamfitters. Source: Jacobs 2023a, CA EDD 2023

TABLE 5.11-5 PROJECTED EMPLOYMENT GROWTH

El Centro MSA (Imperial County)	Anticipated Number of Positions	Year 2020	Year 2030	Annual Average Percent Change
Operations Manager	1	650	790	21.5%
Control Operator	4	310	320	3.2%
Shift Supervisor	2	-	-	-
Operators	11	130	130	0%
Plant Operators	4	130	130	0%
Project Analyst	4	-	-	-
Planner	1	30	30	0%
Process Engineer	1	160	180	12.5%
Maintenance Technician III	3	60	70	16.7%
Instrument & Electrical Technician	2	40	40	0%
Maintenance Technician IV-Welder/Valve	2	-	-	-
Turbine	1	-	-	-
Resource Technician I/III	2	-	-	-
Resource Supervisor	1	-	-	-
Drilling Supervisor	1	-	-	-
DVC Support	2	-	-	-
Lab Tech I/II/III	3	40	50	25%
Portable Water	1	-	-	-
Lab Supervisor	1	160	180	12.5%
Project Engineer	1	160	180	12.5%
Senior Project Engineer	1	-	-	-
NDE Techs	1	-	-	-
NDE Supervisor	1	-	-	-
Drafting	1	50	50	0%
Lab or Engineering Manager	1	160	180	12.5%
Environmental Engineer	1	-	-	-
Environmental Coordinator	1	-	-	-
Sr. Environmental Coordinator	1	-	-	-
Hazard Waste Coordinator	1	-	-	-
90 Day Crew	1	-	-	-
Health and Safety	1	-	-	-
Warehouse Staff[1]	1	720	900	25%
Procurement Specialist[2]	1	90	100	11.1%

Notes: - No data available; 1 Laborers and Freight, Stock, and Material Movers; 2 Buyers and Purchasing Agents.
Source: Jacobs 2023a, CA EDD 2023

Public Services

Police and fire services would be provided from departments within Imperial County. Recreational facilities and other public facilities, such as libraries, are within Imperial County. The project site is located within the Calipatria Unified School District.

Fire Protection

The project would be within the jurisdiction of Imperial County Fire Department (ICFD). The ICFD provides fire protection, medical, aircraft rescue firefighting, technical rescue, and hazardous material and hazardous device incident responses services to the unincorporated communities of the county, townships and the City of Imperial (ICFD 2023). The CAL FIRE maps for Imperial County indicates the project is in an area of local responsibility (CAL FIRE 2007).

The ICFD has nine stations and six contracting agencies. The closest ICFD station to the project site is in the community of Heber, approximately 31 miles south of the project. The department contracts with Calipatria, which has a station located approximately six miles southeast of the project site. The nearest fire station to the project site is the Niland fire station, located approximately 4.8 miles east of the project. The fire station is staffed with a captain, firefighter and reserve firefighter. The ICFD has mutual aid plans with the surrounding stations. (ICFD 2023 and Jacobs 2023j)

Police Protection

Police protection would be provided by the Imperial County Sheriff Office (ICSO). The ICSO employs 100 full time deputies. The ICSO is organized into three patrol divisions and the project site is in the North County Patrol Division. Within the North County Patrol Division, the Niland substation is closest to the project site. The Niland substation is approximately 5 miles northeast of the project and staffed with 10 deputies. (Jacobs 2023j, ICSO 2023)

Schools

The project would be located within the Calipatria Unified School District (district). The district encompasses approximately 480 square miles, bordering the southeastern part of the Salton Sea. It serves the communities of Calipatria, Niland, and Bombay Beach in Imperial County (CUSD 2023). The district had an enrollment of 1,172 in the 2022/2023 school year (CDE 2023). District facilities include two elementary schools, one middle school, and one high school. The nearest school to the project site is Grace Smith Elementary, approximately 4.5 miles northeast of the project site.

Parks

The Imperial County Planning and Development Services Department operates 6 parks, a community center, and a museum. County parks offer a variety of passive and active recreation opportunities, including playground equipment, basketball courts, picnic tables, barbecue grills, campsites, walking trails, boating and fishing opportunities, and open space (ICCOSE 2016 pg. 34). County policy stipulates that five acres of parkland should be dedicated for every 1,000 people (ICPRE 2008). The population for the unincorporated area on Imperial County is estimated at 33,833 (CA DOF 2023). Based on this current estimate, approximately 169 acres would be needed to meet the park standard. The county maintains 250.7 acres of parks and meets the park standard.

The Red Hill Marina Park is the closest park to MBGP, located approximately one mile west of the project site. The park includes boat launches, RV hookups, a camping area, restrooms, ramadas, picnic tables, and shoreline fishing (ICPRE 2008 pg. 7). The park is managed by the county.

Other Public Facilities

Imperial County has 4 branch libraries to serve the county. The closest library to the project site the Calipatria Branch, which is approximately 6.5 miles to the southeast (ICL 2023).

Regulatory

Federal

No federal regulations related to socioeconomics apply to the project**.**

State

California Education Code, Section 17620. The governing body of any school district is authorized to levy a fee, charge, dedication, or other requirement for the purpose of funding the construction or reconstruction of school facilities.

Local

Calipatria Unified School District Board Policy BP 7211 Facilities: Developer Fees. To finance the construction or reconstruction of school facilities needed to accommodate students coming from new development, the Governing Board may establish, levy and collect developer fees on residential, commercial and industrial construction within the district, subject to restrictions specified by law and administrative regulation.

Cumulative

A project may result in a significant adverse cumulative impact when its effects are cumulatively considerable. Cumulatively considerable means the incremental effects of an individual projects are significant when viewed in connection with the effects of past projects, other current projects, and probably future projects. Staff used Imperial County as the geographic scope for socioeconomic cumulative impacts. A master list of cumulative projects located within the study is provided in **Section 1 Executive Summary**, **Table 1-2**. These projects include:

- Black Rock Geothermal Project (BRGP) – geothermal project
- Elmore North Geothermal Project (ENGP) – geothermal project
- Energy Source Mineral ATLIS Project – commercial lithium hydroxide production plant
- Hell's Kitchen – geothermal project
- Midway IV – solar project

- Nider – solar project
- VEGA SES 2, 3, and 5 Solar Energy Project – solar project
- Wilkinson Solar Farm (Calipal Solar Farm I) – solar project
- Wister Solar Energy Facility Project (Ormat Water) – solar project

5.11.2 Environmental Impacts

SOCIOECONOMICS	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Would the project induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐
b. Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐
c. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
i. Fire protection?	☐	☐	☐	☒
ii. Police Protection?	☐	☐	☐	☒
iii. Schools?	☐	☐	☐	☒
iv. Parks?	☐	☐	☐	☒
v. Other public facilities?	☐	☐	☐	☒
d. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
e. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Environmental checklist established by CEQA Guidelines, Appendix G, population and housing, public services, and recreation.

5.11.2.1 Methodology and Thresholds of Significance

Methodology

The determination of the significance of any impacts on population, housing, police protection, schools, and parks and recreation is based on expert testimony, including input from local and state agencies, and the industry-accepted, two-hour commute range for construction workers and one-hour commute range for operational workers.

Thresholds of Significance

There are no additional thresholds of significance applicable to this project.

5.11.2.2 Direct and Indirect Impacts

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

Construction

Less Than Significant Impact. The project would not directly or indirectly induce substantial unplanned growth in Imperial County. The project consists of a geothermal power plant and associated infrastructure. The project does not propose new housing or land use designation changes.

Construction activities are planned to last 29 months and require an average of 255 workers and a peak of 560 workers in month 19. The applicant anticipates most of the construction workforce would be sourced from Imperial County. Approximately 20 percent would be local from and 20 percent non-local from nearby counties. Typically, non-local workers would seek lodging closer to the project site and return to their primary residences on weekends. Therefore, during construction, there would be an average of 204 local workers and 51 non-local workers.

Typically, non-local workers would seed lodging closer to the project site and return to their primary residences on weekends. Lodging available in the cities of Brawley, Calipatria, and Westmoreland consist of six hotels and motels with approximately 398 rooms. There are three RV parks and campgrounds with approximately 1,286 sites available located near the community of Niland (Good Sam 2024). The applicant would also make provision for temporary construction camps near the project site. These camps would be available for the duration of project construction and accommodate up to 750 RV and trailer sites, as needed. The construction camps would be potentially shared during the concurrent construction of two other geothermal projects, the BRGP and ENGP.

As shown in **Table 5.11-3** and **Table 5.11-4**, there is sufficient construction workforce in the El Centro MSA (Imperial County) and San Diego-Carlsbad MSA (San Diego County).

Therefore, the project's construction workforce would not directly and indirectly induce substantial population growth in the project area. The impacts would be less than significant.

Operation

Less Than Significant Impact. The project would employ approximately 61 operation workers (Jacobs 2023a pg. 5.10-13). The applicant anticipates the operation workforce would be sourced locally from Imperial County, although it is possible some workers may commute from nearby counties or relocate closer to the project site. As shown in **Table 5.11-5** there is a sufficient local operations workforce in the El Centro MSA (Imperial County). If some operations workers were to relocate closer to the project site, the housing data shows a vacancy rate of 8.2 percent for Imperial County and 20.1 percent for unincorporated Imperial County. A 5-percent vacancy is a largely industry-accepted minimum benchmark for a sufficient amount of housing available for occupancy (Virginia Tech 2006). There is a sufficient supply of housing units available if operation workers seek to relocate closer to the project site. Therefore, the impact would be less than significant.

b. Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

Construction

Less Than Significant Impact. The project would not necessitate the construction of replacement housing. The project site existing land uses are open space and recreation. Project construction would average 255 workers and have a peak of 560 workers of which approximately 20 percent would be non-local. The project includes a temporary construction camp available for workers who may temporarily relocate closer to the project site. Additionally, there are hotels and motels and RV parks and campground nearby for temporary housing. The project construction would not displace any people or housing. Construction of replacement housing elsewhere would not be necessary. The impact would be less significant.

Operation

No Impact. The project site current uses are open space and recreational. There is no housing on the project site. Therefore, the project would not displace any people or housing. Construction of replacement housing elsewhere would not be necessary and thus, no impact would occur.

c. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable

service ratios, response times, or other performance objectives for any of the public services:

i. Fire protection?

Construction

No Impact. The project site would be serviced by the ICFD and the CFD. The CFD would be the primary responder to the project site. The response time to the project site would be approximately 15 to 20 minutes. The CFD would be the primary responder. CFD and ICFD have mutual aid plans with surrounding fire stations, including Niland Fire District and California State Prison Fire Department, in the event additional assistance is needed. (Jacobs 2023j)

Project construction activities that could pose a risk for fire or the need for fire protection response due to heated exhaust or sparks, include the use of cranes, power auger or drills, excavation equipment, construction vehicles, scrapers, and bulldozers. Other construction activities with a potential fire risk due to heat sources or open flames could include the use of torches or welding equipment.

Permanent facility fire suppression systems would be placed in service during construction. A Fire Protection and Prevention Plan would be developed and followed throughout all phases of construction and provide the necessary firefighting equipment (Jacobs 2023a p. 5.16-14).

While there may be a slight increased need for fire protection response during project construction, the effects would not be sufficient to induce the construction of new or physically altered governmental facilities that could result in significant environmental impacts. Therefore, no impact would result from construction.

Operation

No Impact. The project would employ approximately 61 operation workers that would be drawn locally from Imperial County. If some operation workers were to relocate closer to the project site, they would have a negligible effect on the ability of fire stations to meet their emergency service and response standards.

The CFP would provide the primary fire protection, inspections, and firefighting services for the project. The project would have onsite fire protection systems and would be supported by local fire protection services. The Imperial County Fire Chief would perform a final fire safety inspection upon completion of construction and would continue to conduct the fire safety inspections thereafter (Jacobs 2023a). With all the above elements, the project would not result in substantial adverse physical environmental impacts associated with the provision of new or physically altered fire service facilities to maintain acceptable service ratios, response times, or other performance objectives. Therefore, no impact would result from operation.

ii. Police protection?

Construction

No Impact. The project site would be serviced by the ICSO. The ICSO response time would be less than 20 minutes (Jacobs 2023j). Project construction would include a six-foot-high chain-linked security fence installed around the site boundary and laydown areas, with onsite security personnel (Jacobs 2023a). Approximately 20 percent of the construction workforce would be non-local and may temporarily relocate closer to the project site. Security lighting and perimeter fencing would be installed around the construction camps (Jacobs 2023a). While there may be a slight increase in need for emergency response services, including police protection, this would be temporary and cease at the end of project construction. The sheriff's office would not be significantly affected by the project nor would the project induce the construction of new or physically altered government facilities, such a sheriff stations, that could result in significant environmental impacts. Therefore, no impact would result from construction.

Operation

No Impact. The 61 operations workers that would be employed by the project would have a negligible effect on the emergency response times of the stations that serve the project site. If some operation workers were to relocate closer to the project site, there would a limited effect on police protection.

The project site would have security fencing, security gate, and 24-hour operational security, according to an approved security plan (Jacobs 2023a). The project would not result in substantial adverse physical environmental impacts associate with the provision of new or physically altered police service facilities to maintain acceptable service rations, response times, or other performance objectives. Therefore, no impact would result from operation.

iii. Schools?

Construction

No Impact. The project would be within the Calipatria Unified School District. Based on the number and proximity of the available workforce for the project, construction workers from the surrounding cities and counties are not likely to temporarily relocate closer to the project site. Based on staff's experience, construction workers who seek lodging closer to the project site do not bring their families with them. Therefore, construction workers who might temporarily relocate closer to the project site would not increase the need for school facilities or have an effect on service ratios to the extent that new or physically altered school facilities would be necessary. Therefore, no impact would result from construction.

Operation

No Impact. Based on the proximity of the small number of operational employees and their expected availability, operation workers from neighboring cities are not likely to permanently relocate to the project site. However, if some of the 61 operational workers were to permanently relocate closer to the project, it is unlikely that there would be an increase in the need for schools or an effect on service ratios to the extent that new or physically altered school facilities would be necessary. As no new physically or altered school facilities would be needed, no impact would result from operation.

iv. Parks

Construction

No Impact. As identified in subsection 5.11.1, Imperial County meets its park standard with the ratio of 5 acres of parkland per 1,000 people. Construction of the project would require an average of 255 workers and a peak workforce of 560. Approximately 20 percent of the construction workforce would be non-local and may temporarily relocate closer to the project site. However, it is unlikely workers would visit park facilities while working in the project area; workers tend to return to their primary residence for the weekends. If some construction workers were to visit park facilities, the use would be temporary and cease at the end of project construction. Construction of the project would not affect park standards or increase the demand for park facilities. The project construction would have no impact on parks or parks facilities.

Operation

No Impact. The project would employ approximately 61 operation workers. The workers would be drawn from Imperial County and would reside within commuting distance to the project site. If some operation workers were to relocate closer to the project site, the few new residents would have a negligible increase on the usage of or demand for parks or other recreational facilities. Therefore, the project would not result in substantial adverse physical environmental impacts associated with the provision of new or physically altered park facilities to maintain acceptable service rations or other performance objectives. Therefore, the project would have no impact on park facilities.

v. Other public facilities?

Construction

No Impact. Most of the construction workforce would be drawn from Imperial County. Approximately 20 percent of the construction workforce would be non-local and may temporarily relocate closer to the project site. It is unlikely they would visit public facilities such as public libraries while working in the project area. If construction workers were to visit public facilities in the vicinity of the project, the use would be temporary and cease at the end of construction. Therefore, the project construction would have no impact to other public facilities.

Operation

No Impact. The project's 61 operations workers are expected to be drawn from Imperial County and reside within commuting distance to the project. If some operation workers were to relocate closer to the project, the increased usage or demand for the surrounding libraries would be negligible. Therefore, the project's operation would have no impact to other public facilities.

d. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

Construction

No Impact. Project construction is planned to take 29 months and require an average of 255 workers and a peak of 560 workers. Most of the workforce would be local, recruited from Imperial County, and approximately 20 percent of the workforce would be non-local. Construction workers are not likely to visit parks and recreational facilities while working on the project. Non-local workers may seek lodging closer to the project site but would typically return to their residences on the weekend. Thus, the project would not increase the use of or accelerate the physical deterioration of parks or other recreational facilities. Therefore, the project would have no impact on the surrounding parks and recreational facilities.

Operation

No Impact. The project would require approximately 61 operations workers. They would be drawn locally from Imperial County. If some workers were to relocate closer to the project site, they would not be in numbers where use of existing parks or recreational facilities would be increased to the extent that substantial physical deterioration of the park or facility would result. There would be no impact to surrounding parks and recreational facilities.

e. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Construction

No Impact. Recreational facilities are not included nor would the project require the construction or expansion of recreational facilities. Project construction would last 29 months and require an average of 255 workers and a peak of 560 workers. Approximately 80 percent of the construction workforce would be local and 20 percent non-local. Some workers are likely to temporarily relocate closer to the project site. Construction workers do not typically visit recreational facilities while working on projects. If some workers were to use nearby recreational facilities, the usage would be temporary and end with the completion of construction. The project would not require the construction or expansion of recreational facilities. Therefore, the project would have no impact.

Operation

No Impact. Operation of the project would require approximately 61 operation workers drawn from Imperial County. If some workers were to relocate closer to the project site, they would not be in numbers that would require construction or expansion of recreational facilities to accommodate the project. Therefore, the project would have no impact on surrounding parks and recreational facilities and would not require the construction or expansion of recreational facilities.

5.11.2.3 Cumulative Impacts

Less Than Significant Impact. The construction and operation of MBGP would not make a cumulatively considerable contribution to any significant cumulative impacts related to population and housing, and public services and recreation facilities. Cumulative impacts could occur when more than one project in the same area has overlapping construction schedules, thus creating a demand for workers that cannot be met locally, or when a project's demand for public services does not match a local jurisdiction's ability to provide such services. An influx of non-local workers and their dependents can strain housing, parks and recreation, and law enforcement services, and fire protection services.

In assessing the project's direct impacts, staff assumed approximately 20 percent of MBGP workforce would be non-local and may seek temporary lodging closer to the project site. In assessing cumulative impacts staff estimates the workforce for the cumulative projects would include about 20 percent non-local workers.

CEC staff used Imperial County as the geographic scope for cumulative impacts. Staff considered projects that would likely employ a similar workforce to the MBGP and that could have construction schedules overlapping with the MBGP. Project construction would last 29 months, beginning in 2024 and operation is expected to begin in 2026.

Labor

The socioeconomic impacts of the project are primarily driven by its construction workforce needs. MBGP would average 255 workers and a peak of 560 workers during project construction. The cumulative projects in the study area are solar and geothermal projects that would require workers in the similar occupations as MBGP. The cumulative projects are at different stages of approval and development, so the labor needed to construct them would spread out over time.

Two cumulative projects, ENGP and BRGP, would be constructed concurrently with MBGP. Both ENGP and BRGP anticipate most of their construction workers would commute to the project site from within the Imperial County or from the San Diego metropolitan area. Both projects would use the same occupations as MBGP. As shown in **Tables 5.11-6** there is sufficient workforce for these projects.

TABLE 5.11-6 LABOR SUPPLY FOR THE STUDY AREA

Total Labor (Construction Workforce*)	Total Workforce for 2020	Total Projected Workforce for 2030	Growth from 2020	Percent Growth from 2020
El Centro MSA (Imperial County)	1,510	1,660	150	9.9%
San Diego-Carlsbad MSA (San Diego County)	74,300	88,140	13,840	18.6%

Notes: Total workforce includes only the crafts specifically needed for MBGP. *See Table 5.11-3 and Table 5.11-4 for list of occupations included in total construction workforce figures. Source CA EDD 2023

Housing

Approximately 20 percent of MBGP construction workforce would be non-local and may seek temporary lodging closer to the project site. Additionally, the ENGP and BRGP cumulative projects would be constructed concurrently with MBGP and they also anticipate 20 percent of their construction workforce to be non-local. Construction camps with up to 750 RV and trailer sites would be available to the construction workforce of the ENGP, MBGP, and BRGP projects.

The 61 workers for project operations would be sourced locally from Imperial County, although it is possible some workers may relocate closer to the project site. Imperial County has a housing vacancy rate 8.2 percent which well above the 5-percent industry-accepted minimum benchmark for the sufficient amount of housing available for occupancy (Virginia Tech 2006). If some operational workers relocated the demand for housing would be less than significant and not contribute to a cumulatively considerable impact on the housing supply.

Public Services

The project would be serviced by the ICFD and CFD. There are mutual aid plans with surrounding fire stations in the event additional assistance is needed. Hazardous Materials Management conditions of certification **HAZ-5** would require a site security plan for construction phase of the project and **HAZ-6** would require a site security plan for the commissioning and operational phases of the project. The project would not create a need for new or physically altered facilities that could result in significant environmental impacts. The project would not have an incremental impact on fire protection services. Even if the cumulative projects listed in Table 1-2 create a significant demand on fire protection services, MBGP would not have an incremental contribution to a cumulative impact.

The project would be serviced by the ICSO. Security concerns would be addressed with Hazardous Materials Management **HAZ-5** and **HAZ-6**. The project would not result in the need for new or physically altered law enforcement facilities which could cause significant environmental impacts. Thus, the project would not have an incremental impact on law enforcement services.

Operation workers would be sourced locally from Imperial County so there would likely be no additional students added to the Calipatria Unified School District. If some workers relocated closer to the project it would not have an incremental impact on the schools.

Construction workers are not likely to spend time at parks and recreational facilities while working on the project. Non-local construction workers who seek temporary lodging closer to the project site do not bring their families with them and return to their residences over the weekend. Thus, the project would not affect parks or other public facilities. The project would not have an incremental impact on parks or other public facilities.

Operation workers would be drawn from Imperial County so there would be no impact to parks and other public facilities. If some workers relocated closer to the project it would not have an incremental impact on the parks or other public facilities.

5.11.3 Project Conformance with Applicable LORS

Table 5.11-7 contains staff's determination of conformance with applicable local and state laws, ordinances, regulations, and standard (LORS), including any proposed conditions of certification, where applicable, to ensure the project would comply with LORS. No federal regulations related to socioeconomics apply to the project.

TABLE 5.11-7 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
State	
California Education Code, section 17620	
The governing board of any school district is authorized to levy a fee, charge, dedication, or other requirement for the purpose of funding the construction or reconstruction of school facilities.	**Yes.** Condition of certification COC **SOCIO-1** would require the project owner to pay school impact fees to the Calipatria Unified School District.
California Code Government Code, sections 65995-65998	
Except for a fee, charge, dedication, or other requirement authorized under Section 17620 of the Education Code, state and local public agencies may not impose fees, charges, or other financial requirement to offset the cost for school facilities.	**Yes.** The proposed project would not trigger any state and local public agency fees, etc. to offset the cost for school facilities. Therefore, the project is in conformance.
Local	
Calipatria School District Board Policy	
BP 7211 Facilities: Developer Fees – In order to finance the construction or reconstruction of school facilities needed to accommodate students coming from new development, the Governing Board may establish, levy and collect developer fees on residential, commercial and industrial construction within the district, subject to restrictions specified by law and administrative regulation.	**Yes. SOCIO-1** would require the project owner to pay school impact fees to the Calipatria Unified School District.

The Calipatria Unified School District Policy (BP 7211 Facilities: Developer Fees) allows the Board of Trustees to establish, levy, and collect developer fees. The current school impact fee for the district is $0.47 per square foot of covered, enclosed

commercial/industrial space (CEC 2024g). Based on the proposed size of the enclosed structure (10,000 square feet), an estimated $47,000 would be assessed. As shown in **Table 5.11-7**, staff concludes that with implementation of condition of certification COC **SOCIO-1**, the project would be consistent with all applicable LORS. The subsection below, "5.11.5 Proposed Conditions of Certification," contains the full text of **SOCIO-1.**

5.11.4 Conclusions and Recommendations

As discussed above, the project would have a less than significant impact related to socioeconomics and would conform with applicable LORS through the implementation of **SOCIO-1**. Staff recommends adopting condition of certification **SOCIO-1**.

5.11.5 Proposed Conditions of Certification

The following proposed COCs would ensure conformance with applicable LORS.

SOCIO-1 The project owner shall pay the current one-time statutory school facility development fee to Cailpatria Unified School District as authorized by Education Code Section 17620 and the Calipatria School District Board Policy BP 7211 Facilities: Developer Fees.

Verification: At least 30 days prior to the start of on construction, the project owner shall provide to the compliance project manager (CPM) proof of payment to the Calipatria Unified School District of the statutory development fees.

5.11.6 References

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ICFD 2023 – Imperial County Fire Department & Office of Emergency Services (ICFD). Accessed October 2023. Accessed online at: https://firedept.imperialcounty.org/

ICL 2023 – Imperial County Library (ICL). Accessed November 2023. Accessed online at: https://library.imperialcounty.org/#locations

ICPRE 2008 – Imperial County Parks and Recreation Element (ICPRE). Approved on January 29, 2008. Accessed online at: https://www.icpds.com/assets/planning/parks-recreation-element-2008.pdf

ICSO 2023 – Imperial County Sheriff's Office (ICSO). Accessed October 2023. Accessed online at: https://icso.imperialcounty.org/operations/#patrol

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5.12 Solid Waste Management

James Ackerman

5.12.1 Environmental Setting

The proposed Morton Bay Geothermal Project (MBGP or project) would be constructed approximately four miles southwest of the town of Niland, California within the Salton Sea Known Geothermal Resource Area. The project would be on a 51-acre portion of a 160-acre parcel. The balance of the project includes nine production wells, and 11 injection wells on outlying well pad compounds. Aboveground pipelines would transport the geothermal fluids from the production wells to the geothermal Resource Production Facility (RPF) and spent geothermal fluids would be transported also by aboveground pipelines to Environmental Protection Agency classified Class V injection wells and returned to the geothermal reservoir. The net power output of the facility is expected at 140 megawatts (MWs) (Jacobs 2023a).

Solid Waste Generation and Disposal

This section evaluates non-hazardous waste management associated with the project. Hazardous waste management is evaluated in Section 5.7, Hazards, Hazardous Materials/Waste, and Wildfire section of this preliminary staff assessment. Solid waste generated during construction is anticipated to consist of scrap wood, glass, plastic and metal, concrete, silicate or mineral insulation, and trash. Soil generated during excavation is expected to be used onsite during grading activities.

The primary solid waste anticipated during plant operation would be filter cake generated during the processing of geothermal fluids. After the steam separation, geothermal fluids would be treated through clarifiers where minerals contained in the fluid would be removed as a slurry. The solids slurry discharged from the clarifiers would be directed to a vacuum filtration system to produce filter cake. Based on the proposed facility design, it is estimated that 95 percent of the filter cake would be characterized as non-hazardous and 5 percent would be characterized as hazardous due to elevated heavy metal concentration. Commercial trash, as well as faulty metal parts and electronic components, would also be generated during project operation. Solid waste generated during the project's construction and operational phases would be recycled to the greatest extent possible.

Construction solid waste and commercial trash generated during plant operation would most likely be collected by Republic Services and transported to the Allied Imperial Class III landfill in Imperial, California. According to CalRecycle, the Allied Imperial Landfill (SWIS No. 13-AA-0019) is permitted through 2040 to accept a maximum of 1700 tons of solid waste per day and as of December 31, 2019, had a remaining capacity of 12.4 million cubic yards (cy) (CalRecycle 2023a).

The filter cake generated during plant operation would be transported to the Desert Valley Company Monofill (DVCM) Class II facility located in Brawley, California (SWIS No. 13-AA-0022). The DVCM facility specializes in the disposal of geothermal industry-related wastes. It should be noted that Berkshire Hathaway Energy Renewables LLC (BHER) is the parent company of DVCM (Calexico Chronicle 2022). The DVCM is currently permitted through January 31, 2025 to accept a maximum of 750 tons of solid waste per day (CalRecycle 2023b). The Calexico Chronicle reported in January 2022 that the last active cell had a remaining capacity of 1.3 million cy (Calexico Chronicle 2022). However, in July 2021, an Environmental Impact Report (EIR) was prepared for the Imperial County Planning and Development Services Department to expand the landfill to a capacity of 2.6 million cy (BRG Consulting 2021). Imperial County subsequently approved the EIR on January 25, 2023 (ICPDSD 2023).

Regulatory

Federal

Resource Conservation and Recovery Act (RCRA), 40 CFR, Subtitle D. RCRA Subtitle D regulates the disposal of non-hazardous waste. It includes guidelines for the storage and collection of residential, commercial, and institutional solid waste (Part 243), and source separation for material recovery (Part 246) design of municipal solid waste facilities (Part 258).

State

Integrated Waste Management Act (PRC §§ 40000 et seq.). The Integrated Waste Management Act of 1989 established the California Integrated Waste Management Board (CIWMB), revamped the government codes regulating solid waste management, and required cities and counties to reduce the amount of solid waste disposed of in landfills by 50 percent. To comply with the Integrated Waste Management Act, counties must adopt regulations and policies to fulfill the requirements of the Act.

Mandatory Commercial Recycling Law, PRC Section § 42649.2. Effective on May 7, 2012, PRC 42649.2 set a statewide goal of reducing solid waste by 75 percent by 2020. It also established mandatory recycling programs for solid waste generated by businesses, public entities, and multi-family dwellings. In addition, the Governor signed SB 1018 on July 27, 2012, which amended PRC § 42469.2 to require any business generating over 4 cy of solid waste per week to arrange for recycling services.

Short-Lived Climate Pollutant Reduction Law (PRC §§ 42652 et seq.). The Short-Lived Climate Pollutant Reduction Law established statewide targets to reduce disposal of organic waste to 50 percent of 2014 levels by 2020 and to 75 percent of 2014 levels by 2025 and instructed the California Department of Resources Recycling and Recovery to adopt regulations to achieve these goals.

California Energy Efficiency Standards for Residential and Nonresidential Buildings—Green Building Code (2011), CCR Title 24 Update (2019). The California Green Buildings Standards Code applies to the planning, design, operation, construction, use, and occupancy of newly constructed buildings and requires energy and water-efficient indoor infrastructure. Specifically, Section 5.408.1 requires recycling or reuse of 65 percent of construction waste to divert these wastes away from a landfill.

Local

Imperial County Ordinance, Chapter 8.72.100. This chapter of the County ordinance prohibits disposal of industrial waste within the county except as authorized by statute, regulations, ordinance or other law.

5.12.2 Environmental Impacts

SOLID WASTE MANAGEMENT Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. 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?	☐	☐	☒	☐
b. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, Utilities and Service Systems.

5.12.2.1 Methodology and Thresholds of Significance

There are no applicable methodologies or additional thresholds of significance applicable to this project.

5.12.2.2 Direct and Indirect Impacts

a. Would the project 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?

Construction

Less Than Significant Impact. During the expected 29-month construction period, solid waste consisting of the following materials would be generated:

- Paper, wood, glass, and plastics (6,525 tons) – An estimated 225 tons per month of these materials would be generated from packing materials, waste lumber, insulation, and empty non-hazardous chemical containers.

- Concrete (6,000 tons) – Excess concrete is expected to be generated during project construction.
- Metal (2,900 tons) – During construction, an estimated 100 tons per month of metals would be generated from cutting and welding operations, electrical wiring, packing materials, and empty non-hazardous chemical containers.

An estimated 15,425 tons of solid waste would be generated during project construction. By converting the estimated tonnage of materials provided in the application, approximately 102,927 cy of solid waste would be generated during project construction (SCDHEC 2015). This solid waste would be diverted from landfills and recycled to the extent possible to comply with PRC § 42649.2 and the Green Building Code. However, solid waste that cannot be recycled would likely be disposed of in the Allied Imperial Facility in Imperial, California. Assuming all the construction-related solid waste could not be recycled, it would represent 0.8 percent of the available remaining capacity (12,027,900 cy) for the Allied Imperial landfill. Moreover, there are three additional Class III landfills in Imperial County that could receive the solid waste generated during project construction; Calexico Solid Waste Site (1,561,235 cy capacity), Niland Solid Waste Site (1,100,000,000 cy capacity), and Salton City Solid Waste Site (62,974,488 cy capacity) (CalRecycle 2023c). The Construction Waste Management Plan (CWMP) required in Condition of Certification (COC) **SOLID WASTE 1** would ensure the recycling of solid waste generated during project construction to the greatest extent possible.

Therefore, the impact resulting from the construction of the proposed project on landfill capacity would be less than significant.

Operation

Less Than Significant Impact. During operation of the project, the following primary waste streams would be generated annually:

- Nonhazardous filter cake generated during the processing of geothermal fluids (24,000 tons).
- Commercial solid waste (120 tons).
- Broken metal parts and electrical components (0.6 tons or 1,200 pounds).

An estimated 24,121 tons of solid waste would be generated during operation of the facility annually. Operational solid waste would be diverted from landfills and recycled as practical to comply with PRC § 42649.2 and the Green Building Code. However, solid waste that cannot be recycled would be disposed of at either a Class III or Class II landfill. Commercial solid waste and faulty metal or electronic components would be disposed at the Allied Imperial facility. The estimated 2,700 cy of this material generated annually would have an insignificant impact on the remaining landfill capacity (12,027,900 cy).

The geothermal filter cake would be disposed of at the DVCM Class II facility. DVCM currently has a remaining capacity of 789,644 cy (CalRecycle 2023b). However,

completion of the Cell 4 expansion would increase the capacity to 2.6 million (BRG Consulting 2021). The estimated 14,239 cy of geothermal filter cake generated annually would be two percent of the current capacity, but 0.5 percent of the planned increased capacity. The Operation Waste Management Plan (OWMP) required in **SOLID WASTE 1** would ensure the recycling of solid waste generated during project operation to the greatest extent possible.

Therefore, the impact resulting from the operation of the proposed project on landfill capacity would be less than significant.

b. Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Construction and Operation

No Impact. The California Integrated Waste Management Act of 1989 requires local jurisdictions in California to reduce, by 50 percent, the amount of solid waste disposed of in landfills by the year 2000 and beyond. Moreover, PRC § 42649.2 set statewide goals of reducing solid waste by 75 percent by 2020 and Senate Bill 1383 of 2016 establishes statewide targets to reduce organic waste levels to 75 percent by 2025.

During construction, the project operator would collect and haul construction debris off-site for recycling or disposal in local jurisdictions that have programs in place to comply with these state requirements.

During operation, the project would comply with federal, state, and local statutes and regulations related to solid waste. Commercial solid waste, scrap metal, and faulty electronic components would be collected and hauled off-site for recycling or disposal. Nonhazardous geothermal filter cake would be hauled to the DVCM Class II facility permitted exclusively for geothermal waste products. Management of hazardous waste and applicable federal regulations are discussed in **Section 5.7 Hazards, Hazardous Materials/Waste and Wildfire**.

The project would comply with federal, state, or local statutes and regulations related to solid waste management and reduction, therefore, no impact would occur.

5.12.2.3 Cumulative Impacts

Less Than Significant Impact with Mitigation. During construction, the combined amount of solid waste generated by the three proposed geothermal projects (MBGP, Elmore North Geothermal Project [ENGP], and Black Rock Geothermal Project [BRGP]) would be approximately 14,168 tons as pro-rated for 12 months. For commercial solid waste and faulty metal/electronic components during project operations, all three geothermal projects would generate approximately 315 tons annually. These solid waste streams would be transported to a Class III facility if not recycled; most likely the Allied Imperial facility, although there are three other Class III landfill alternatives as previously noted.

The cumulative total of Class III landfill solid waste generated annually would be approximately 14,483 tons. The 2022 annual tonnage noted for the Allied Imperial facility was 99,875 tons and was 304,901 tons for all four Imperial County landfills (CalRecycle 2023c). Therefore, the project solid waste impact for Class III landfills would represent approximately 15 percent of the Allied Imperial facility's annual tonnage and approximately 5 percent of the tonnage for all Imperial County Class III landfills. Given the low percentage of all Imperial County Class III landfill tonnage, this cumulative impact would be less than significant.

During the operational phase for all three BHER geothermal projects, the annual cumulative tonnage of geothermal filter cake transported to the DVCM Class II landfill would be approximately 62,000 tons. The 2022 annual tonnage noted for the DVCM facility was 44,424 tons (CalRecycle 2023c). The annual cumulative geothermal filter cake tonnage would exceed the annual tonnage reported for DVCM in 2022. However, the annual cumulative geothermal filter cake tonnage would represent 2.4 percent of the planned expanded Cell 4 capacity for the DVCM facility. Therefore, the cumulative impact regarding the disposal of nonhazardous geothermal filter cake would be less than significant if the DVCM facility Cell 4 expansion is completed prior to the three proposed geothermal projects exhausting the current DVCM capacity. The applicant has identified the Copper Mountain Landfill in Yuma, Arizona, as an alternative disposal option if the DVCM facility Cell 4 expansion is not completed in time. **SOLID WASTE 2** would give CEC staff the opportunity to ensure compliance with LORS if an alternative facility for filter cake disposal is necessary in the future.

Based on the previous discussion, the cumulative impact of all three proposed geothermal projects (MBGP, BRGP, and ENGP) with respect to local landfill capacity would be less than significant.

5.12.3 Project Conformance with Applicable LORS

Table 5.12-1 presents staff's determination of conformance with applicable local, state and federal LORS, including any proposed COCs, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with the implementation of specific COCs, the proposed project would be consistent with all applicable LORS. The subsection below, "Proposed Conditions of Certification," contains the full text of the referenced COCs.

TABLE 5.12-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
Federal	
Resource Conservation and Recovery Act (RCRA)	
40 CFR § 256.26 requires that state solid waste management plans to prohibit open dumping per Section 4005 of the original act. 40 CFR § 268.34 prohibits land disposal of wastes deemed hazardous due to the toxicity of metals. This	**Yes.** The project would comply with 40 CFR § 256.26 since the proposed landfill is permitted as a Class III facility.

TABLE 5.12-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
would apply for an estimated 5% of the filter cake generated by the project.	**Yes.** The project would comply with 40 CFR § 268.34 since the proposed Class II landfill is permitted to accept filter cake waste.
State	
Integrated Waste Management Act	
PRC § 40059.1 mandated 50 percent of solid waste be diverted from landfills by the year 2000.	**Yes.** The project would comply with **PRC** § 40059.1 participating in local recycling programs through solid waste disposal services. In addition, **SOLID WASTE-2** would assist with the solid waste reduction requirement of the statute.
PRC § 42649.2 requires a business that generates more than 4 c.y. to arrange for recycling services consistent with state or local laws.	**Yes**. The project owner would arrange for recycling services to the extent possible to comply with PRC § 42649.2. **SOLID WASTE-2** would assist with the solid waste reduction requirement of the statute.
Local	
Imperial County Ordinance	
Chapter 8.74 of the Imperial County ordinance prohibits unauthorized dumping of waste	**Yes.** The project would comply with Chapter 8.74 of the Imperial County ordinance by using landfills permitted to accept the appropriate waste.

5.12.4 Conclusions and Recommendations

As discussed above, with the implementation of COCs, the project would have a less than significant impact related to solid waste management and would conform with applicable LORS. CEC staff recommends adopting **SOLID WASTE-1** and **SOLID WASTE-2** as detailed in subsection "5.12.5 Proposed Conditions of Certification" below.

5.12.5 Proposed Conditions of Certification

The following proposed COC/MMs include measures to both mitigate environmental impacts and ensure conformance with applicable LORS. The conditions below are enforceable as part of the CEC's certificate for the portions of the projects constituting the site and related facility. Additional impacts associated with project components outside of CECs jurisdiction, such as the well complex licensed by CalGEM, the temporary structures such as the laydown yard to be permitted by Imperial County, and the switchyard to be permitted by IID, require mitigation to be less than significant.

This CEQA analysis evaluates all impacts resulting from all aspects of the project, and for the entire project to have less than significant impacts, the mitigation actions described in these COC/MMs would need to be implemented by the various licensing jurisdictions as mitigation measures (MMs). For purposes of the facility certification issued by CEC, the following COC/MMs must be complied with by the applicant on the jurisdictional site and related facilities as delineated in the Project Description, Section 3.1. Verifications set forth below only apply to the COCs, not the MMs.

COC SOLID WASTE-1/MM SOLID WASTE-1 The project owner shall prepare a Construction Waste Management Plan (CWMP) and an Operation Waste Management Plan (OWMP) for all wastes generated during construction and operation of the facility, respectively, and shall submit both plans to the Compliance Project Manager (CPM) for review and approval. The plans shall contain, at a minimum, the following:

- A description of all waste streams, including projections of frequency, amounts generated and hazard classifications; and
- Methods of managing each waste, including treatment methods and companies contracted with for treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/reduction plans.

Verification: No less than 30 days prior to the start of site mobilization, the project owner shall submit the CWMP to the CPM.

The OWMP shall be submitted to the CPM no less than 30 days prior to the start of project operation. The project owner shall submit any required revisions within 20 days of notification by the CPM.

In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to the planned management methods.

COC SOLID WASTE-2/MM SOLID WASTE-2 If at any time the Desert Valley Company Monofill (DVCM) Class II facility can no longer accept nonhazardous geothermal filter cake, the project owner shall notify the CPM of a proposed alternative disposal facility in sufficient time to ensure a seamless transition avoiding any disruption to project operation. The project owner shall verify that the proposed alternative disposal facility is permitted to accept the nonhazardous geothermal filter cake waste and assess if the estimated waste volume would create a significant impact to the disposal facility and the surrounding environment.

Verification: The project owner shall notify the CPM of the need to change disposal facilities with 10 days of discovery that the DVCM Class II facility will no longer accept geothermal filter cake waste.

The project owner shall provide the impact assessment of the alternative disposal facility to the CPM for review and approval within 30 days of the DVCM Class II facility change discovery. The project owner shall not transport the geothermal filter cake to the alternative disposal facility until the CPM approves the disposal facility prior to transport.

The project owner shall document any change of disposal facility for nonhazardous geothermal filter cake in the Annual Compliance Report.

5.12.6 References

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CalRecycle 2023a – California Department of Resources Recycling and Recovery (CalRecycle). Imperial Landfill (SWIS Facility No 13-AA-0019), SWIS Facility/Site Activity Details website. Accessed on November 2, 2023. Available online at: https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/4191?siteID=603

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SCDHEC 2015 – South Carolina Department of Health and Environmental Control (SCDHEC). Volume-To-Weight Conversion Factors table. Prepared May 5, 2015. Accessed on November 6, 2023. Available online at:

https://dc.statelibrary.sc.gov/bitstream/handle/10827/18367/DHEC_Volume_to_Weight_2015-03.pdf?sequence=1&isAllowed=y

5.13 Transmission Line Safety and Nuisance

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This section describes the environmental and regulatory setting, and discusses impacts associated with the construction and operation of the project and project conformance with applicable Laws, Ordinances, Regulations, and Standards (LORS) specific to transmission line safety and nuisance. The project components and their operation that could result in impacts associated with transmission line safety and nuisance and are regulated by applicable LORS include the proposed 230 kilovolt (kV) generator tie-line and the 230 kV switching station.

5.13.1 Environmental Setting

The proposed project would change the environmental setting by adding a 230 kilovolt (kV) above-ground generator tie-line (gen-tie) to interconnect the proposed Morton Bay Geothermal Project (MBGP or project) to the first point of interconnection, a yet-to-be-built Imperial Irrigation District (IID) 230kV switching station. The gen-tie would be approximately 3.2 miles long. The MBGP would be owned and operated by the applicant, along with the associated gen-tie. The project would be on approximately 55 acres of a 160-acre parcel within the unincorporated, Known Geothermal Resource Area (KGRA) of Imperial County California.

Regulatory

The national, federal, state, and local laws and policies in the next section apply to the control of the field and non-field impacts of electric power lines. Staff's analysis examines the project's compliance with these requirements. There are different versions of the National Electrical Code (NEC) enforced throughout the United States, and this is because the Code does not actually fall under federal law. Instead, it is a "uniform code", a set of guidelines which each state may adopt and apply as they see fit.

National

Institute of Electrical and Electronics Engineers (IEEE)

IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity. IEEE and its members inspire a global community through its highly cited publications, conferences, technology standards, and professional and educational activities.

American National Standards Institute (ANSI)

ANSI is a private, non-profit organization that administers and coordinates the U.S. voluntary standards and conformity assessment system.

National Electrical Safety Code (NESC)

NESC is a United States standard of the safe installation, operation, and maintenance of electric power and communication utility systems including power substations, power and communication overhead lines, and power and communication underground lines.

Federal

Code of Federal Regulations (CFR)

Title 47, CFR, section 15.205, Federal Communications Commission (FCC)

Prohibits operation of devices that can interfere with radio- frequency communication.

State

California Public Utilities Commission General Order 52 (GO-52)

Governs the construction and operation of power and communications lines to prevent or mitigate interference.

CPUC, General Order-131-D" Rules for Planning and Construction of Electric Generation, Line, and Substation Facilities in California"

Specifies application and noticing requirements for new line construction including EMF reduction.

CPUC, General Order 95 (GO-95), "Rules for Overhead Electric Line Construction"

Governs clearance requirements to prevent hazardous shocks, grounding techniques to minimize nuisance shocks, and maintenance and inspection requirements.

CPUC, General Order 128 (GO-128), "Rules for construction of underground electric supply and communication systems"

The order formulates uniform requirements for underground electric supply and communication line construction in California.

California Code of Regulations (CCR)

Title 8, California Code of Regulations (CCR) section 2700 et seq. "High Voltage Safety Orders"

Specifies requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment.

Title14, Cal. Code Regs., sections 1250-1258, "Fire Prevention Standards for Electric Utilities"

Provides specific exemptions from electric pole and tower firebreak and conductor clearance standards and specifies when and where standards apply.

Cumulative

The project could have cumulative impact associated with Transmission Line Safety and Nuisance (TLSN) if other power-generating facilities are sited adjacent to the MBGP and share the gen-tie line to transmit electricity to the grid. The applicant has proposed three generating facilities within the KGRA. However, these generating facilities are not adjacent to each other and do not share a common gen-tie line with the MBGP to transmit electricity from the plant to the IID switchyard.

5.13.2 Environmental Impacts

TRANSMISSION LINE SAFETY AND NUISANCE Would the project's transmission line either physically or electrically (via its electromagnetic field):	**Significant and Unavoidable Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Affect aviation safety?	☐	☐	☐	☒
b. Interfere with radio frequency communication?	☐	☐	☒	☐
c. Be a source of audible noise?	☐	☐	☒	☐
d. Be a fire hazard?	☐	☒	☐	☐
e. Be a source of hazardous shock?	☐	☒	☐	☐
f. Be a source of nuisance shock?	☐	☒	☐	☐
g. Affect public health?	☐	☒	☐	☐

Environmental checklist established by Cal. Code Regs., tit. 20, Div. 2, Ch. 5, Powerplant and Transmission Line Jurisdictional Investigations, Appendix B, Transmission System Safety and Nuisance

Transmission System Components

The project's maximum continuous rating is approximately 157 megawatts (MW) gross output, with an expected net output of approximately 140 MW. The applicant provided a map showing the entire gen-tie route from the MBGP site to the proposed new 230-kV IID switching station. The 230-kV transmission interconnection for the proposed project facility would consist of a single gen-tie connection, which would require one take-off, one dead end, and approximately 29 tangent 230-kV structures. The gen-tie line, plant substation, and its components would be owned, operated, and maintained by the applicant. The new IID switchyard would be owned, operated, and maintained by the IID.

Alternating current electricity would be produced by the 13.8 kV steam turbine generator (STG) at the plant. The output of the STG would be connected by the isolated phase bus to a two-winding, oil-filled 13.8 kV to the project's 230 kV main step-up transformer. Electricity generated by the project would be delivered to an onsite substation near the northeast corner of the MBGP site. Generated power would be transferred from the bus bar of the substation into the take-off structure of the plant by utilizing a small overhead line segment of conductors. The gen-tie would facilitate the power transfer from the take-

off structure of the plant into the IID transmission system at a new 230 kV switching station near the intersection of Garst Road and West Sinclair Road.

Specific gen-tie right-of-away (ROW) requirements depend on the project-selected structure type, height, span, and conductor configuration. The single steel pole structures for the MBGP lines would range from 100 to 125 feet in height, spaced approximately 600 feet apart with an overall ROW width of 125 feet. The phase conductors will be arranged vertically on three side arms for each circuit as shown in Figure 3.1. The 3.22-mile-long gen-tie line would be built with 477 Kcmil 26/7, ACSR Hawk" conductors. The conductor's current carrying capacity is approximately 659 amperes. One shield wire with an integrated fiber optic cable will be installed with the new gen-tie line associated with the project. The fiber optic cable will be used for any necessary communications within IID's transmission system. (Jacobs 2023e AFC 2, Appendix 3, Electric Transmission. Jacobs 2023a, volume 1, Section 2.3,3.1, Figure 3.1, 3.2a)

Grounding safety is imperative for site personnel and electrical equipment. The electrical system is protected (protection schemes by utilizing Supervisory Control and Data Acquisition (SCADA)) against ground faults that result in unit ground potential rises. The station grounding system provides a path to dissipate unsafe ground fault currents and reduces the ground potential rise. The grounding conductor will be sized for sufficient capacity to reduce the most severe fault conditions within allowable limits. The project's onsite substation electrical components and each pole of the gen-tie line would be grounded according to the National Electrical Safety Code (NESC), California Public Utilities Code (CPUC) G.O. 95, and 128 standards and guidelines.

The CEC staff has concluded that the first point of grid interconnection would be the dead-end structure adjacent to the IID switching station as proposed by the applicant and therefore staff must analyze the impacts accordingly. For a more detailed discussion regarding the first point of grid interconnection, as well as a discussion of potential environmental impacts associated with transmission facilities necessary for the project, not licensed by the CEC, please see **Section 4.3 Transmission System Engineering**.

5.13.2.1 Methodology and Thresholds of Significance

With the exception of the above environmental checklist, no other methodology or thresholds of significance were used.

5.13.2.2 Direct and Indirect Impacts

a. Would the project's transmission line either physically or electrically (via its electromagnetic field) affect aviation safety?

No Impact. For MBGP, any potential hazard to the area aircraft would potentially cause a collision in the navigable airspace. The requirements in the LORS listed in **Table 5.13.1** establish the standards for assessing the potential for obstruction hazards within the navigable airspace. The requirements also establish the criteria for determining when to notify the Federal Aviation Administration (FAA) about such hazards. For example, FAA

notification is required in cases of structures over 200 feet above ground level, or if the structure were to be less than 200 feet in height but within the restricted airspace in the approaches to public or military airports and heliports. Moreover, for airports with runways longer than 3,200 feet, the restricted space is defined by the FAA as an area of space that extends 20,000 feet (3.3 nautical miles) from the runway. For airports with runways of 3,200 feet or less, the restricted airspace is defined as a space that extends 10,000 feet from the runway. For heliports, the restricted space is an area of space that extends 5,000 feet (0.8 nautical miles) from the landing site.

CEC staff has assessed the potential for a civil aviation hazard regarding the height of the proposed project transmission lines. The project transmission system would be 120 feet in height, which is less than the 200-foot height of concern to the FAA. The nearest airport (Imperial County Airport) to the project site is 23 miles distant. Therefore, CEC staff concludes that the transmission lines would not pose a significant collision hazard to civil aviation or aircraft. Thus, an FAA "Notice of Proposed Construction or Alteration" (Form 7460) for an obstruction hazard would not be necessary. (Jacobs 2023a, Appendix A, Page 9, Figure 3-1)

However, the project site is within military airspace areas, including an area classified as Special Use Airspace – Low Altitude – Military Operation Area (MOA), as well as Military Training Route – Visual and Military Training Route Corridor – Visual (U.S. Army Corps 2024). These are associated with nearby military areas including Naval Air Facility El Centro, the Target 101 Shade Tree Bombing Range, and the Chocolate Mountain Aerial Gunnery Range. The applicant has notified the military of the project through the Department of Defense (DoD) Clearinghouse (Jacobs 2024i). The DoD responded in a letter dated April 4, 2024, stating that the proposed siting location of the geothermal project may impact United States Marine Corps low-level flight traffic in Special Use Airspace, and requesting that the applicant contact a DoD staff member to discuss the project. The applicant has contacted the DoD staff member and is currently awaiting a response (Jacobs 2024r).

b. Would the project's transmission line either physically or electrically (via its electromagnetic field) interfere with radio-frequency communication?

Less Than Significant Impact. Transmission line-related radio-frequency interference is one of the indirect effects of line operation. It is produced by the physical interactions of line electric fields. More specifically, such interference is due to radio noise produced by the action of the electric fields on the surface of the energized conductor. The process involved is known as *corona discharge* but is referred to as *spark gap electric discharge* when it occurs within gaps between the conductor and insulators or metal fittings. Corona from a transmission line may result in radio and television reception interference, audible noise, light, and the production of ozone. When generated, such noise manifests itself as perceivable interference with radio or television signal reception or interference with other forms of radio communication.

Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration, and weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines. The level of any such interference usually depends on the magnitude of the electric fields involved and the distance from the line. The potential for such impacts therefore would be minimized by reducing the line's electric fields and by locating the line away from inhabited areas.

The MBGP transmission lines would be built and maintained according to standard practices that minimize surface irregularities and discontinuities. Moreover, the potential for such corona-related interference is usually of concern for lines of 345 kV and above, and not for 230-kV lines such as the proposed line of the MBGP. The proposed project's gen- tie line is rated at less than 345 kV and the project's boundary with no nearby residents (Appendix A, Section 5.1). It is unlikely that the project transmission line would have any effect on radio or television reception due to unbuilt bare land around the transmission interconnection. CEC staff does not expect any corona-related radio-frequency interference or complaints and does not recommend any related condition of certification (COC).

c. Would the project's transmission line either physically or electrically (via its electromagnetic field) be a source of audible noise?

Less Than Significant Impact. Audible noise usually results from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying, or hissing sound or hum, especially in wet weather. Since the noise level depends on the strength of the line's electric field, the potential for perception would be assessed by estimating the field strengths during operation. Such noise is usually generated during rainfall, but mainly from overhead lines of 345 kV or higher. Audible noise is, therefore, not generally expected at significant levels from lines of less than 345 kV as proposed for the MBGP. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing that the fair-weather audible noise from modern transmission lines is generally indistinguishable from background noise at the edge of a ROW of 100 feet or more. A more detailed discussion of the proximity of potentially sensitive receptors is found in **Section 5.9 Noise and Vibration.** Since the proposed line ROW would fall mainly within the boundaries of the MBGP boundary and IID service area, CEC staff does not expect the proposed line operation to add significantly to current background noise levels in the project area. (Jacobs 2023a, AFC volume 1, Section 3.3,1.5, Figure 1.4).

The noise-reducing designs related to electric field intensity are not specifically mandated by federal or state regulations in terms of specific noise limits. Instead, such audible noise is limited through design, construction, or maintenance practices established from industry research and experience as effective without significant impacts online safety, efficiency, maintainability, and reliability. Since these designs are also aimed at minimizing field strengths, CEC staff does not expect the proposed line operation to add significantly to current background noise levels in the project area. For an assessment of

the noise from the proposed project and related facilities, please refer to staff's analysis in **Section 5.9 Noise and Vibration.**

d. Would the project's transmission line either physically or electrically (via its electromagnetic field) be a fire hazard?

Less Than Significant with Mitigation Incorporated. The fire hazards addressed in **Table 5.13.1** are those that could be caused by sparks from conductors of overhead lines, or that could result from direct contact between a line and nearby trees and other combustible objects.

The requirements of the existing IID fire prevention and suppression program would be implemented for the proposed project line. The applicant would comply with Title 14, California Code of Regulations, Section 1250, Article 4, which establishes fire prevention standards for electric power generation facilities. Also, CPUC GO-95 establishes rules and guidelines for transmission line construction including clearances from other manmade and natural structures, and tree-trimming requirements to mitigate fire hazards. Therefore, the applicant's intention to ensure compliance with the clearance-related aspects of GO-95 would be an important part of this mitigation approach. Although the new line would be located within the MBGP's site area, condition of certifications **TLSN-1** and **TLSN-2** are recommended to ensure compliance with these program requirements. (Jacobs 2023a, AFC volume 1, Section 5.1)

e. Would the project's transmission line either physically or electrically (via its electromagnetic field) be a source of hazardous shock?

Less Than Significant with Mitigation Incorporated. Hazardous shocks are those that could result from direct or indirect contact between an individual and the energized line, whether overhead or underground. Such shocks are capable of serious physiological harm or death. Hazard shocks remain a driving force in the design and operation of transmission and other high-voltage lines.

No design-specific federal regulations have been established to prevent hazardous shocks from overhead power lines. Safety is assured within the industry from compliance with the requirements specifying the minimum national safe operating clearances applicable in areas where the line might be accessible to the public.

Potentially hazardous shocks could result from electrical faults from the new MBGP equipment of the substation, gen-tie line, or the IID high-voltage transmission system. The existing IID 230-kV transmission system is within a secured area under IID's access control. The proposed new IID switchyard and plant substation would be fenced to keep individuals from entering the area where they could be exposed to associated hazardous shocks. The new MBGP's 230-kV generation tie lines would be designed in accordance with applicable LORS. Implementing the GO-95-related measures against direct contact with the energized line would serve to minimize the risk of hazardous shocks. Because the lines would be constructed in conformance with the requirements of CPUC GO-95 and Title 8 California Code of Regulations (CCR) 2700, hazardous shocks are highly unlikely

to occur because of the project's construction and operation. CEC staff's recommended conditions of certification **TLSN-1** and **TLSN-3** would be adequate to ensure the implementation of the necessary mitigation measures. (Jacobs 2023a, AFC volume 1, Section 3.4.1)

f. Would the project's transmission line either physically or electrically (via its electromagnetic field) be a source of nuisance shock?

Less Than Significant with Mitigation incorporated. Nuisance shocks are caused by current flow at levels generally incapable of causing significant physiological harm. They result mostly from direct contact with metal objects electrically charged by fields from the energized line. Such electric charges are induced in different ways by the line's EMF.

There are no design-specific federal or state regulations to limit nuisance shocks in the transmission line environment. For modern overhead high-voltage lines, such shocks are effectively minimized through grounding practices and procedures specified in the NESC and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE).

For the proposed project line, the project owner would be responsible in all cases for ensuring compliance with these grounding-related practices within the ROW. Staff recommends condition of certification **TLSN-3** to ensure such grounding for MBGP. (Jacobs 2023a, AFC volume 1, Section 3.4.1)

g. Would the project's transmission line either physically or electrically (via its electromagnetic field) affect public health?

Less Than Significant with Mitigation Incorporated. EMF is created whenever electricity flows, and exposure to them together is generally referred to as EMF exposure. There is public concern regarding the possibility of health effects from EMF exposure.

The electrical transmission interconnection and other electrical devices that would be constructed as part of the project emit EMF when in operation. These fields are typically measured near ground level, where they are encountered by people. EMF fields, to the extent they occur, could impact receptors on the properties adjacent to the project site (Appendix 1, Section 3.6.1).

As previously stated, the project electrical transmission interconnection and other electrical devices would be mainly within the MBGP site and IID's transmission system. There are no receptors adjacent to the project site. Site access is restricted and would be limited to station workers, incidental construction and maintenance personnel, other company personnel, regulatory inspectors, and approved guests. Because access would not be available to the public, public exposure to EMF is not expected to occur from MBGP or the transmission facilities to be constructed as part of the project (Jacobs 2023a, AFC volume 1, Section 3.5).

Industries and Applicant's Approach to Reducing EMF Exposures

The present focus of EMF exposure concern is on the magnetic field. This is because, unlike electric fields, magnetic fields would penetrate the soil, buildings, and other materials to produce the types of human exposures at the root of health concerns. The industry seeks to reduce exposure, not by setting specific exposure limits, but through design guidelines that minimize exposure in each given case.

In comparison to the strong magnetic fields from the more visible high-voltage power lines, CEC staff considers it important, for perspective, to note that an individual in a home could be exposed to much stronger fields from high-voltage lines while using some common household appliances (National Institute of Environmental Health Sciences 1998). The difference between these types of field exposures is that the higher-level, appliance-related exposures are short-term duration, while the exposures from power lines are lower level, but long-term duration. Scientists have not established which of these exposure types would be more biologically meaningful in the individual. CEC staff notes such exposure differences only to show that high-level magnetic field exposures regularly occur in areas other than around high-voltage power lines.

As with MBGP project lines, specific field strength-reducing measures would be incorporated into the proposed line design to ensure the field strength minimization currently required by the CPUC given the concern over EMF exposure and health.

The field reduction measures that could be applied include the following:

1. increasing the distance between the conductors and the ground to an optimal level.
2. reducing the spacing between the conductors to an optimal level.
3. minimizing the current in the line; and
4. arranging current flow to maximize the cancellation effects from interacting of conductor fields.

Long-term residential field exposures would not be a significant concern since the route of the proposed project's transmission line avoids residences. The field strengths of most significance would be encountered within the boundaries of the proposed MBGP, and an IID-controlled area. These field intensities would depend on the effectiveness of the applied field-reducing measures. The requirements in condition of certification **TLSN-4** for field strength measurements are intended to assess the applicant's assumed field reduction efficiency. The actual contribution to the area's field exposure levels would be documented for the proposed route from the results of the field strength measurements required in **TLSN-4,** for field strength measurements are intended to assess the applicant's assumed field reduction efficiency.

5.13.2.3 Cumulative Impacts

No Impact. The three generating facilities identified above in the "Environmental Setting" subsection are not adjacent to MBGP. Additionally, these facilities do not share a common

gen-tie line with the MBGP to transmit power from the plant to the IID switchyard. For these reasons, no adverse impacts are anticipated due to MBGP combined with the other projects.

5.13.3 Project Conformance with Applicable LORS

TABLE 5.13-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis for Determination
Federal	
Title 14, Part 77 of the Code of Federal Regulations (CFR)," Objects Affecting the Navigable Air Space". Describes the criteria for determining the need for a Federal Aviation Administration (FAA) "Notice of Proposed Construction or Alteration" in cases of potential obstruction hazards.	**Yes.** The Project's overhead gen-tie line structures would be 120 feet in height, which is less than the 200-feet height of concern to the FAA.
Title 47, CFR, section 15.205, Federal Communications Commission (FCC). Prohibits the operation of devices that can interfere with radio-frequency communication.	**Yes.** The applicant would not use any equipment that emits restricted frequency bands given under section 15.205 of FCC.
State	
California Public Utilities Commission (CPUC) General Order 52 (GO-52). Governs the construction and operation of power and communications lines to prevent or mitigate interference.	**Yes.** The applicant would not construct or operate transmission or communication lines for the prevention or mitigation of inductive interference.
California Public Utilities Commission (CPUC) General Order (GO-95 and GO-128), "Rules for Overhead and Underground Electric Line Construction". Governs clearance requirements to prevent hazardous shocks, grounding techniques to minimize nuisance shocks, and maintenance and inspection requirements.	**Yes.** The applicant would construct Gen-tie line structures with a height of less than 120 feet to satisfy the G.O 95 requirement. All gen-tie structures, components of the substation, and switchyard would be constructed according to the G.O. 95 and 128 electrical grounding standards. Underground circuits of the project would utilize the duct banks to minimize the EMF effects. Thereby satisfy the G.O.128 standards. The applicant would utilize the lighting and surge arresters in the substations, switchyard as it is necessary. Thereby dissipating the fault currents and voltages due to lighting and voltage surges.
Title 8, California Code of Regulations (CCR) section 2700 et seq. "High Voltage Safety Orders". Specifies requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment.	**Yes.** All gen-tie structures, circuits overhead/underground, substations, and switchyard components would be constructed according to "High Voltage Safety Orders".
National Electrical Safety Code (NESC). Specifies grounding procedures to limit nuisance shocks. It also specifies minimum conductor ground clearances.	**Yes.** All Gen-tie structures, components of the substation, and switchyard would be constructed according to the NESC standards and G.O. 95 and 128 grounding standards.

TABLE 5.13-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis for Determination
	Overhead and underground grounding circuits will be designed with proper conductor sizes to dissipate the fault current. The applicant will select proper conductor sizes to satisfy the NESC standards. All the components of the substation or switchyard would be grounded by utilizing the underground grounding grid. The applicant will assess the soil resistivity test for the project's substation, switchyard sites, and transmission line path.
GO-131-D, CPUC" Rules for Planning and Construction of Electric Generation, Line, and Substation Facilities in California". Specifies application and noticing requirements for new line construction including EMF reduction.	**Yes.** The project would be built with proper transmission line clearance with the ground and satisfy G.O.95 Transmission paths Right-of-way requirements. Underground circuits would utilize duct banks to minimize the EMF and de-rated ampacity of conductors.
CPUC Decision D.93-11-013. Specifies CPUC requirements for reducing electric and magnetic fields.	**Yes.** The CPUC Commission required the utilities to undertake no-cost EMF mitigation measures and implement low-cost mitigation measures to the extent approved as part of a project's certification process. "Low-cost" was defined to be within the range of 4% of the total project cost but the Commission specified that this 4% benchmark is not an absolute cap.
CPUC Decision D.06-01-042. Re-affirms CPUC EMF Policy in D.93-11-013.	**Yes.** Re-affirms stated above requirement.
Title14, Cal. Code Regs., sections 1250-1258, "Fire Prevention Standards for Electric Utilities". Provides specific exemptions from electric pole and tower firebreak and conductor clearance standards and specifies when and where standards apply.	**Yes.** The applicant should refer to the Fire Prevention Standards under 1250-1258. (design, construction, and operation phases).
Standards	
Institute of Electrical and Electronics Engineers (IEEE) 1119, "IEEE Guide for Fence Safety Clearances in Electric-Supply Stations". Specifies the guidelines for grounding-related practices within the ROW and substations.	**Yes.** Having a fence around the substation or switchyard and proper Transmission line clearance would facilitate a safety clearance zone. All the components of the substation or switchyard and fence would be grounded by utilizing the underground grounding grid. Maintain the proper ROW of the transmission paths, and substations to minimize the flashover and EMF effects.

TABLE 5.13-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis for Determination
American National Standards Institute (ANSI/IEEE) 644-1944 Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines. Specifies standard procedures for measuring electric power frequency electric and magnetic fields from an operating electric line.	**Yes.** Having a fence around the substation or switchyard and proper Transmission line clearance would facilitate a safety clearance zone. All the components of the substation or switchyard and fence would be grounded by utilizing the underground grounding grid. Maintain the proper ROW of the transmission paths, and substations to minimize the flashover and EMF effects.

Facility Closure

If the proposed MBGP project were to be closed and decommissioned, and all related structures are removed as described in **Section 3 Project Description**, the minimal electric shocks and fire hazards from the physical presence of this gen-tie line would be eliminated. Decommissioning and removal would also eliminate the transmission lines' field and non-field impacts assessed in this analysis in terms of nuisance shocks, radio-frequency impacts, audible noise, and electric and magnetic field exposure, and aviation safety. Since the lines would be designed and operated according to existing CPUC G.O.95 guidelines, these impacts would be as expected for IID lines of the same voltage and current-carrying capacity and therefore, at levels reflecting compliance with existing health and safety LORS.

5.13.4 Conclusions and Recommendations

CEC staff has identified the following conclusions and with the implementation of COCs as detailed in subsection 5.13.5, the project would have a less than significant impact related to TLS&N and would conform with applicable LORS.

- The proposed gen-tie line would lie mainly within the boundaries of the MBGP's gen-tie line ROW and maintained according to the standard procedures of the American National Standard Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) guidelines for line safety and field management. The lines would conform to all applicable laws, ordinances, regulations, and standards.
- Construction and operation of the MBGP's new gen-tie line and onsite substation do not contribute to EMF levels, corona, audible noise, or radio and television interference, beyond the acceptable standards.
- The long-term, mostly residential, magnetic exposure would be insignificant for the proposed gen-tie line given the absence of residences along the proposed route. On-site worker or public exposure would be short-term and at levels expected for IID lines of similar design and current-carrying capacity.

- The potential for nuisance shocks would be minimized through grounding and other field-reducing measures that would be implemented in keeping with current utility standards and guidelines.
- With the four proposed COCs, safety and nuisance impacts from construction and operation of the proposed gen-tie line would be less than significant.

5.13.5 Proposed Conditions of Certification

The following proposed COCs include measures to both mitigate environmental impacts and ensure conformance with applicable LORS. The conditions below are enforceable as part of the CEC's certificate for the portions of the projects constituting the site and related facility. Additional impacts associated with project components outside of CECs jurisdiction, such as the well complex licensed by CalGEM, the temporary structures such as the laydown yard to be permitted by Imperial County, and the switchyard to be permitted by IID, require mitigation to be less than significant.

This CEQA analysis evaluates all impacts resulting from all aspects of the project, and for the entire project to have less than significant impacts, the mitigation actions described in these COCs would need to be implemented by the various licensing jurisdictions as mitigation measures (MMs). For purposes of the facility certification issued by CEC, the following COCs must be complied with by the applicant on the jurisdictional site and related facilities as delineated in the Project Description, Section 3.1. Verifications set forth below only apply to the COCs, not the MMs.

COC TLSN-1/MM TLSN-1 The project owner shall construct the proposed 230-kV transmission lines according to the requirements of California PUC's GO- 95, GO-52, GO-131-D, Title 8, and Group 2, High Voltage Electrical Safety Orders, sections 2700 through 2974 of the California Code of Regulations, and IID's EMF reduction guidelines**.**

Verification: At least 30 days prior to the start of construction of the transmission lines or related structures and facilities, the project owner shall submit to the compliance project manager (CPM) a letter signed by a California registered electrical engineer affirming that the lines will be constructed according to the requirements stated in the condition.

COC TLSN-2/MM TLSN-2 The project owner shall ensure that the route of the proposed transmission lines is kept free of combustible material, as required under the provisions of GO-95 and section 1250 of Title 14 of the California Code of Regulations.

Verification: During the first five years of plant operation, the project owner shall provide a summary of inspection results and any fire prevention activities carried out along the proposed route and provide such summaries in the Annual Compliance Report on transmission line safety and nuisance-related requirements.

COC TLSN-3/MM TLSN-3 The project owner shall ensure that all permanent metallic objects within the proposed route are grounded according to industry standards.

Verification: At least 30 days before the lines are energized, the project owner shall transmit to the CPM a letter confirming compliance with this condition.

COC TLSN-4/MM TLSN-4 The project owner shall measure the maximum strengths of the line EMF at the edge of the ROW to validate the estimates the applicant has provided for these fields. These measurements shall be made (a) according to the standard procedures of the American National Standard Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) and (b) before and after energizing. The measurements shall be completed no later than six months after the start of operations.

Verification: The project owner shall file copies of the pre-and post-energizing measurements with the CPM within 60 days after completion of the measurements.

5.13.6 References

EPRI 1982 — Electric Power Research Institute 1982. Transmission Line Reference Book: 345 kV and above. Accessed online at: https://www.academia.edu/41079824/EPRI_Transmission_Line_Reference_Book_345_kV_and_above

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WHO 2024 — World Health Organization (WHO). 2024 Electromagnetic fields (EMF). Accessed online at: https://www.who.int/news-room/questions-and-answers/item/radiation-electromagnetic-fields

5.14 Transportation

Spencer Reed

5.14.1 Environmental Setting

Existing Conditions

The proposed Morton Bay Geothermal Project (MBGP or project) site is proposed on approximately 51 acres of a 160-acre parcel located in unincorporated Imperial County and within the Salton Sea Known Geothermal Area. It is bound by McDonald Road to the north, Davis Road to the east, Schrimpf Road to the south and the Salton Sea to the immediate west. The existing surrounding land use is comprised primarily of farmed fields and other active geothermal plants. Regional vehicular access to the project would occur from State Route 111 (SR 111) and State Route 78 (SR 78)/State Route 86 (SR 86). Local access would occur primarily from Sinclair Road, English Road, McDonald Road, Gentry Road and Brandt Road. Direct access to the project is proposed from driveways along Davis Road and McDonald Road.

Nearby transportation facilities include the Imperial County Airport, approximately 25.5 miles south of the project.

Descriptions of the roadways and highways likely to be utilized by vehicles travelling to/from the project are provided below. For maps of the project in relation to these roadways, see **Figures 3-1** through **3-4**.

Existing Local and Regional Transportation Network

State Route 111 is a north-south highway that runs parallel to the Salton Sea, east of the project. Within the study area, one lane travels in each direction with left turn pockets provided at select intersections. A short segment north and south of the Main Street intersection in Calipatria widens to two lanes in each direction. Access from SR 111 to the project occurs from Sinclair Road.

State Route 78/State Route 86 join southwest of the Salton Sea to form a primarily east-west highway within the study area. Two lanes travel in each direction with left turn pockets provided at select intersections. Access from SR 78/86 to the project may occur from several north-south roads, including Lack Road, Forrester Road and Gentry Road.

Sinclair Road is an east-west roadway with one lane in each direction. It provides connection to the project from SR 111 by English Road and Mc Donald Road.

Mc Donald Road is an unpaved east-west road which provides connection to the Project from SR 111 and also provides connection to the project from SR 78/SR 86 by English Road, Sinclair Road, and Gentry Road.

Gentry Road is a north-south roadway with one lane in each direction. It provides connection to the project from SR 78/SR 86 by McDonald Road, English Road, Sinclair Road and Forrester Road.

Brandt Road is a north-south roadway with one lane in each direction. It provides connection to the project from SR 78/SR 86 by McDonald Road, English Road and Sinclair Road.

Existing Bicycle, Pedestrian and Transit Facilities

There are no sidewalks or bicycle facilities that exist on roadways accessing the proposed project or within the study area. The nearest transit stops within vicinity of the project are located in Calipatria and Niland, and are served by Imperial Valley Transit's 2, 22 and 51 bus routes.

Regulatory

Laws, Ordinances, Regulations and Standards (LORS) related to transportation are summarized below. Details regarding all federal, state and local LORS that apply to the project are included. CEC staff's analysis of project compliance with these LORS is presented in **Table 5.14-14.**

Federal

Code of Federal Regulations. The Code of Federal Regulations, Title 49, contains the federal rules and regulations pertaining to the transportation of goods and materials. Title 14 contains federal regulations pertaining to air transportation and aviation.

State

California Vehicle Code (CVC) and Streets and Highways Code. The California Vehicle Code and the Streets and Highways Code contain requirements applicable to the licensing of drivers and vehicles, the transportation of hazardous materials, and right-of-way.

California State Planning Law. Government Code, Section 65302 requires that the project must conform to the General Plan.

Manual on Uniform Traffic Control Devices (MUTCD). The MUTCD provides standards and guidelines for the design and usage of traffic control devices, such as signs, signals, and pavement markings, to ensure uniformity and consistency on roads and highways across the United States. It regulates construction-related signage and striping, offering guidelines for temporary traffic control in work zones. It ensures consistent and safe practices on roads during construction activities.

Local

Imperial County Municipal Code. The Imperial County Municipal Code contains the laws passed and enforced by the County.

Imperial County General Plan. The project is within the unincorporated area of Imperial County, and therefore subject to the County's General Plan. The general plan's Circulation and Scenic Highways Element specifies long-term planning goals and procedures for transportation infrastructure system quality within Imperial County.

Cumulative

Cumulative projects are identified as past projects, current projects, or reasonably foreseeable future projects that, when viewed in connection with the proposed project, cause its effect(s) on traffic and transportation to be potentially significant. A master list of cumulative projects located within the study area is provided in **Section 1 Executive Summary**, **Table 1-2**. Four cumulative projects were identified within the Project vicinity as relevant to Transportation:

- Hell's Kitchen Geothermal Exploration Project
- Energy Source Mineral ALTiS
- Elmore North Geothermal Project (ENGP)
- Black Rock Geothermal Project (BRGP)

It is assumed that nearby solar projects would not require the presence of full-time employees due to their low operations and maintenance activity and are therefore not included in the Cumulative Setting for Transportation.

5.14.2 Environmental Impacts

TRANSPORTATION Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☐	☒
b. 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)?	☐	☐	☐	☒

TRANSPORTATION Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
d. Result in inadequate emergency access?	☐	☐	☒	☐

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, transportation.

5.14.2.1 Methodology and Thresholds of Significance

In addition to the above environmental checklist, CE staff used the following methodology and thresholds of significance to evaluate the project.

Level of Service Analysis

The operations of roadway facilities are described with the term "level of service" (LOS). LOS is a qualitative description of traffic flow from a vehicle driver's perspective based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined, ranging from LOS A (free-flow conditions) to LOS F (over-capacity conditions). LOS E corresponds to operations "at capacity." When volumes exceed capacity, stop-and-go conditions result, and the results are designated as LOS F.

Traffic volumes were obtained from traffic counts published by Caltrans in 2019 and field counts conducted in October 2022. Roadway field traffic counts were collected for 48 hours across two weekdays. Intersection traffic counts were collected for two days during the weekday morning period of 5:00 AM to 8:00 AM and the afternoon period of 4:00 PM to 8:00 PM.

Roadway Segments

The LOS analysis evaluated the following roadways:

- SR 111
- Sinclair Road
- Gentry Road
- Brandt Road
- SR 78/SR 86

The LOS analysis methodology for roadway segments consists of dividing the daily roadway volume by the capacity of the roadway based on **Table 5.14-1** to determine the Volume-to-Capacity (V/C) ratio. The associated V/C ratios are compared with the LOS grade ranges of **Table 5.14-2** to assign a qualitative letter grade that represents operations of the roadway.

TABLE 5.14-1 ROADWAY CAPACITY BY FUNCTIONAL CLASSIFICATION

Roadway Classification	Number of Lanes/Cross Section (ft)	LOS Daily Capacity	LOS D Daily Capacity	LOS E Daily Capacity
Minor Arterial	4 lanes / 82 - 102	29,600	33,400	37,000
Minor Collector	2 lanes / 40 - 70	7,100	10,900	16,200

Source: Imperial County General Plan, Circulation and Scenic Highways Element, 2008.

TABLE 5.14-2 ROADWAY SEGMENT LEVEL OF SERVICE CRITERIA

Level of Service	Roadway Volume-to-Capacity (V/C) Ratio
A	0.000 – 0.600
B	0.601 – 0.700
C	0.701 – 0.800
D	0.801 – 0.900
E	0.901 – 1.000
B	>1.000

Source: Transportation Research Circular No. 212, Interim Materials on Highway Capacity, Transportation Research Board, 1980

Unsignalized Intersections

The LOS analysis evaluated the following unsignalized intersections:

- SR 111 and Sinclair Road
- SR 111 and Main Street

Traffic conditions at unsignalized (all-way stop-controlled and two-way stop-controlled) intersections were evaluated using methods developed by the Transportation Research Board (TRB), as documented in the *Highway Capacity Manual 6th Edition* (HCM 6th) for vehicles. The HCM method calculates control delay at an intersection based on inputs such as traffic volumes, lane geometry, and peak hour factors. Control delay is defined as the delay directly associated with the traffic control device (i.e., a stop sign) and specifically includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The relationship between LOS and control delay for unsignalized intersections is summarized in **Table 5.14-3**. At side-street stop-controlled intersections, the delay is calculated for each stop-controlled movement, the left turn movement from the major street, as well as the intersection average. The intersection average delay and highest movement/approach delay are reported for all-way stop-controlled intersections.

TABLE 5.14-3 UNSIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Control Delay in Seconds
A	Little or no delays	≤ 10.0
B	Short traffic delays	> 10.0 to 15.0
C	Average traffic delays	> 15.0 to 25.0
D	Long traffic delays	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic, delays where intersection capacity exceeded	> 50.0

Source: Highway Capacity Manual 6th Edition (Transportation Research Board).

Staff used the LOS standards of Caltrans and the County of Imperial, described in the sections below, as significance thresholds to determine whether project-generated traffic's effects on LOS would create a conflict with the County's General Plan policy.

Vehicles Miles Travelled (VMT) Analysis

Vehicle Miles of Travel (VMT) is a measure used to describe automobile use on a daily basis. VMT is the product of the total number of vehicles traveling and the number of miles traveled per vehicle. In December 2018, the Governor's Office of Planning and Research (OPR) finalized new CEQA guidelines (CEQA Guidelines section 15064.3) that identify VMT as the most appropriate criterion to evaluate a project's transportation impacts. The implementation of Senate Bill (SB) 743 eliminated the use of criteria such as auto delay, level of service, and similar measures of vehicle capacity of traffic congestion as the basis for determining significant impacts as part of CEQA compliance. The SB 743 VMT criteria promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. In compliance with SB 743 mandates, VMT was employed to assess the impacts of this project on the transportation network.

Thresholds of Significance

Imperial County General Plan Policies

The Circulation and Scenic Highways Element LOS requirements specify LOS C as the minimum operating criteria on all roadway segments and intersections.

The following Circulation and Scenic Highway Element Goals for a Safe, Convenient, and Efficient Transportation System apply to the project:

- Goal 1: The County will provide and require an integrated transportation system for the safe and efficient movement of people and goods within and through the County of Imperial with minimum disruption to the environment.
- Objective 1.1: Maintain and improve the existing road and highway network, while providing for future expansion and improvement based on travel demand and the development of alternative travel modes.
- Objective 1.2 – Require a traffic analysis for any new development which may have a significant impact on county roads. A traffic analysis may not be necessary in every situation, such as when the size or location of the project will not have a significant impact upon and generate only a small amount of traffic. Also, certain types of projects, due to the trip generation characteristics, may add virtually no traffic during peak periods. These types of projects may be exempt from the traffic analysis requirements. Whether a particular project qualifies for any exemption will be determined by the Imperial County Department of Public Works Road Commissioner.

Caltrans LOS Standards

Caltrans has identified a target LOS at the transition between LOS C and LOS D on state highway facilities; however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. For the purposes of this assessment, Caltrans intersections may be considered deficient when the addition of project-generated traffic causes roadway or intersection LOS to degrade to LOS D or worse on state highway facilities.

Imperial County VMT Threshold

As Imperial County has not yet formally adopted its own VMT criteria, standards, or thresholds, this assessment follows current OPR guidance. Contained within the "Screening Thresholds for Land Use Projects" section is the following guidance used to "quickly identify when a project should be expected to cause a less-than-significant impact without conducting a detailed study":

"Many local agencies have developed screening thresholds to indicate when a detailed analysis is needed. Absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than-significant transportation impact." (OPR 2018)

For the purpose of this assessment, the project's impact to VMT may be considered less –than significant if the project's estimated daily trips are less than 110.

5.14.2.2 Direct and Indirect Impacts

a. Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Construction

No Impact. Based on the assessment, the addition of project-generated traffic during construction would not cause a substantial increase in traffic volumes within the transportation system affecting the efficiency of the transportation system, including transit, roadway, bicycle, and pedestrian facilities.

Additionally, any effect of project-generated traffic during construction would be temporary in nature and is not expected to result in any long-term impacts to the transportation system.

Therefore, the project would not conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities, resulting in no impact.

Construction Trip Generation

The applicant reports an estimated 29-month construction period, during which up to 560 workers would access the project each working day. This results in 1,120 daily trips occurring to and from the project, of which staff has assumed 40 percent will arrive during the typical AM and PM peak traffic hours. The remaining worker trips will arrive and depart outside of typical peak traffic hours. This assumption is consistent with a typical construction work force schedule.

The applicant reports a total of 13 trucks are estimated to access the project each working day during peak construction months, resulting in 26 delivery/haul truck trips per day. An even distribution of truck trips is assumed to occur over an 8-hour workday, resulting in approximately 3 truck trips per hour. For the purposes of this assessment, truck trips were converted to passenger car trips using a passenger car equivalence (PCE) ratio of 1.5 passenger cars per truck, consistent with HCM methodology. The resultant construction trip generation estimates for daily and peak hour construction trips are summarized below in **Table 5.14-4**.

TABLE 5.14-4 CONSTRUCTION TRIP GENERATION

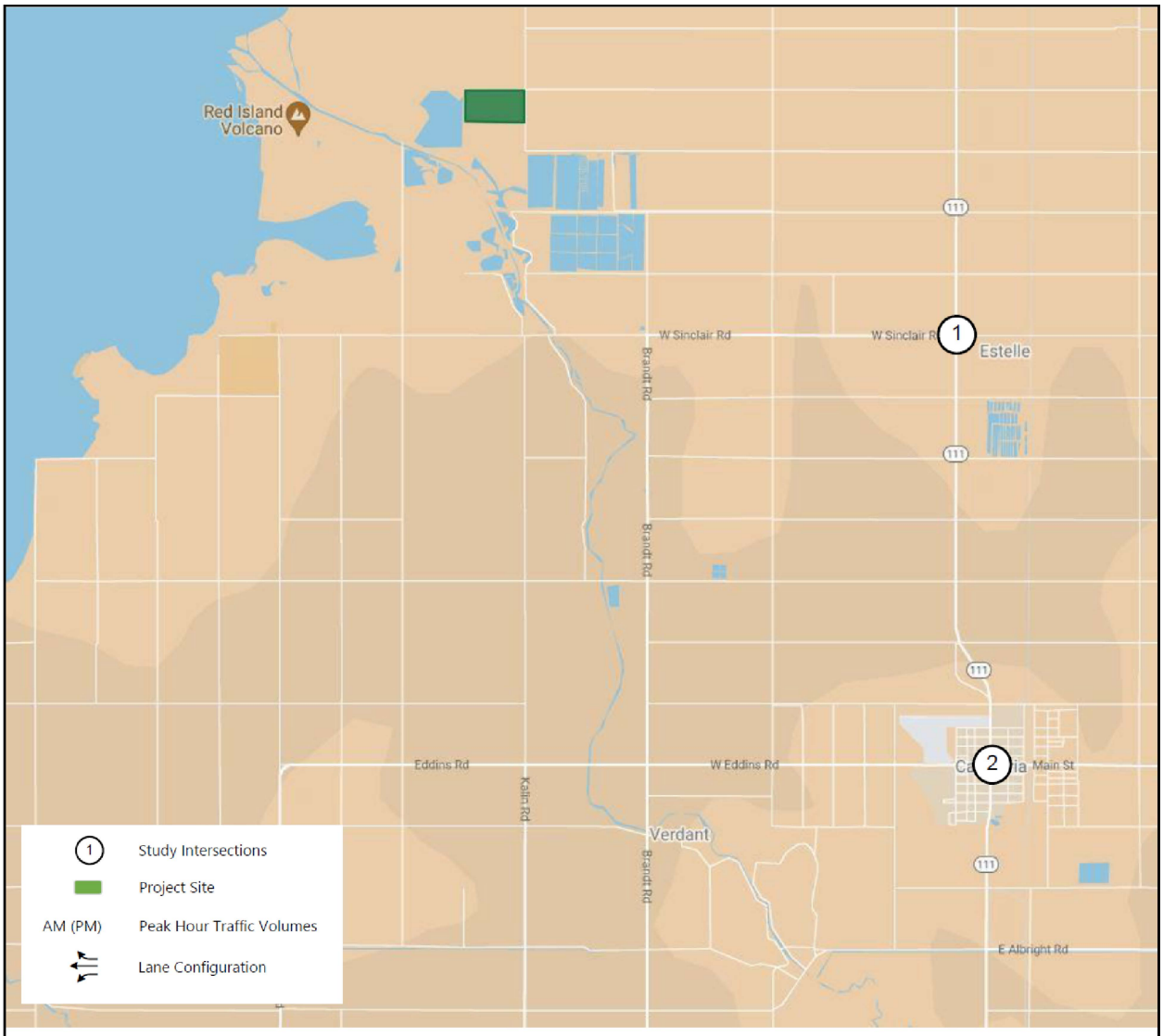
Trip Type	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Delivery/Haul Trucks	26	3	3	6	3	3	6
Delivery/Haul trucks PCE (1.5)	39	5	5	10	5	5	10
Workers	1,120	224	0	224	0	224	224
Total Construction Trips in PCE	1,159	229	5	234	5	229	234

Construction Trip Distribution

Project trip distribution refers to the directions of approach and departure that vehicles would take to access and leave the site. Estimates of regional project trip distribution were developed based on existing travel patterns in the area, and the location of complementary land uses. It is assumed that all construction workers would commute from residences located within Imperial County. The application for certification (AFC) notes that the Project contains up to two potential construction crew camps, with locations shown near the vicinity of the project. For the purposes of this assessment however, a conservative assumption was made that all construction trips would be made to/from surrounding cities and communities within Imperial County. The following assumptions were made regarding project trip distribution to and from the project and are consistent with the AFC:

- 15 percent of the project workforce would originate from Niland and areas to the north (i.e., Indio, and nearby communities).
- 45 percent of the project workforce would originate from the Calipatria and Westmoreland areas.
- 40 percent of the project workforce would originate from further south including Brawley, El Centro and Imperial.

Project trips were then assigned to the roadway network, as shown on **Figure 5.14-1.** It should be noted that approximately 28 percent of trips were assumed to navigate to and from the project using alternative roadway segments and intersections not included in this assessment for study. This assumption accounts for the large number of roadways and varying route choices available to drivers accessing the project from various points within the region.



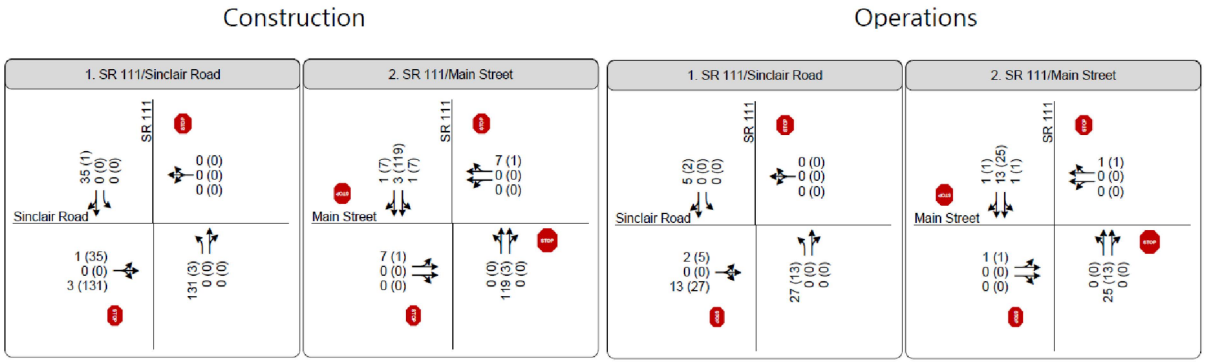
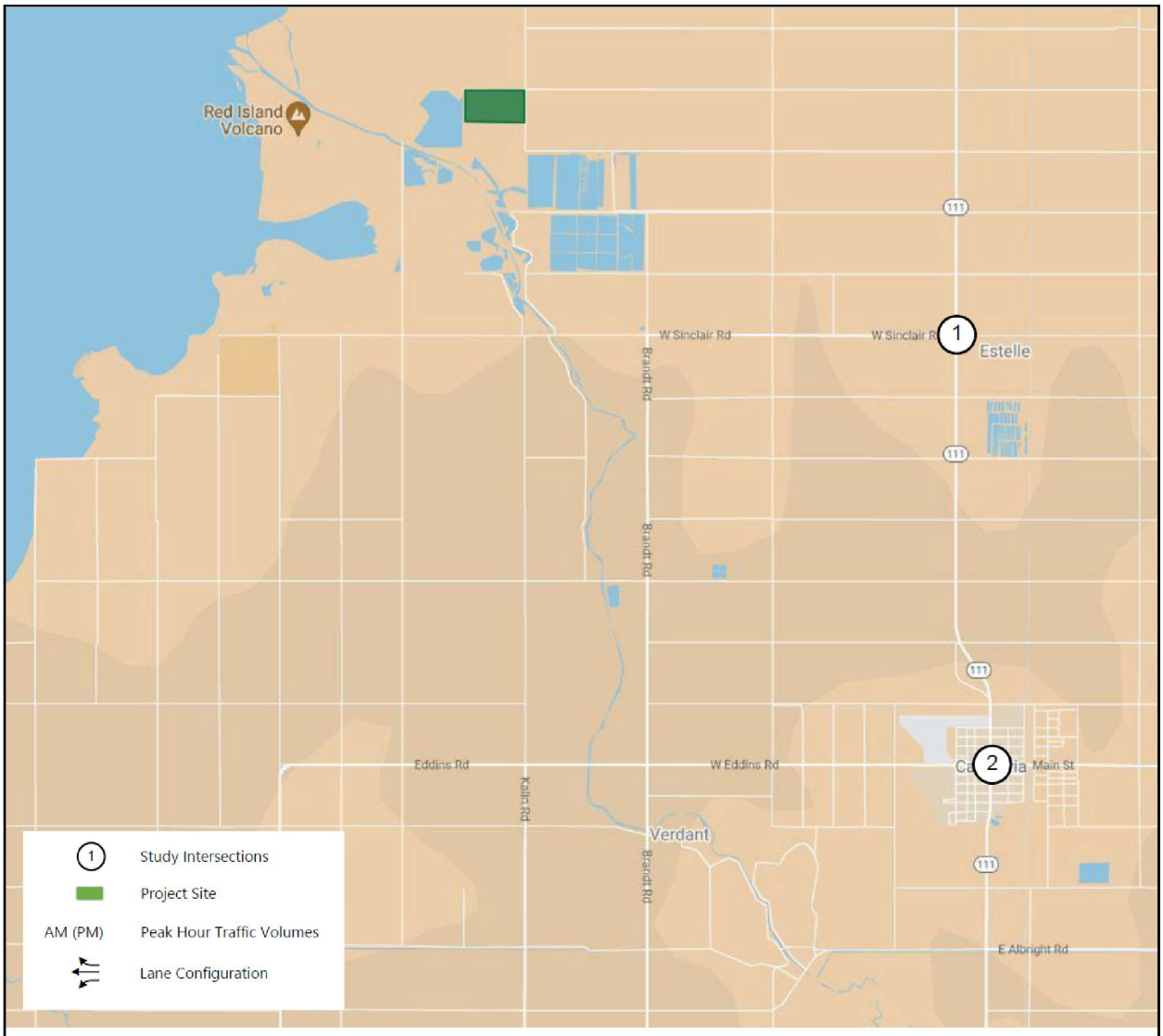


Figure 5.14-1
Project Trip Assignment
Construction - Operations

Sources: Fehr & Peers

Roadway LOS with Construction Traffic

Daily construction trip generation estimates were added to existing traffic volumes along study roadways to develop Existing Plus Construction Condition volumes, as shown on **Figure 5.14-2**. The resultant V/C ratio was then compared to the thresholds described in Section 15.14.2.1 to determine the project's effect on the roadway network. The results of the roadway LOS assessment for existing and with construction traffic scenarios are presented below in **Table 5.14-5.** The assessment results indicate that all roadway segments are projected to operate acceptably (LOS C or better) with the addition of construction traffic.



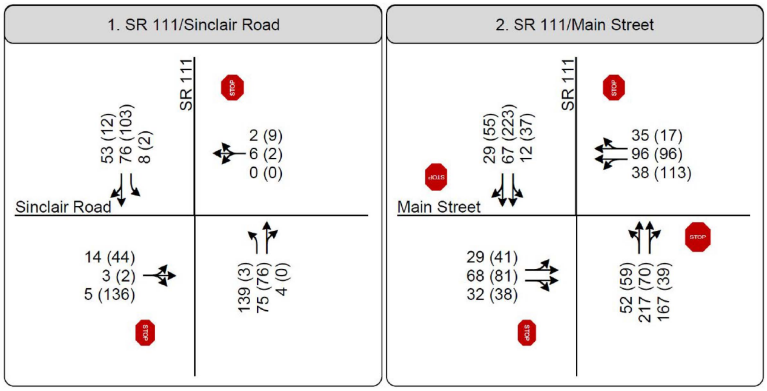


Figure 5.14-2
Peak Hour Traffic Volumes
Existing Plus Construction Condition Volumes

Sources: Fehr & Peers

TABLE 5.14-5 CONSTRUCTION CONDITION ROADWAY SEGMENT LOS RESULTS

Roadway	Segment		# of Lanes	LOS E Capacity	Existing Daily Volume	Existing Plus Construction Daily Volume	Existing Conditions		Construction Conditions	
	Between	And					V/C	LOS C or better?	V/C	LOS C or better?
SR 111	Niland Avenue	McDonald Road	2	16,200	3,000	3,174	0.19	Yes	0.20	Yes
	McDonald Road	Sinclair Road	2	16,200	3,000	3,174	0.19	Yes	0.20	Yes
	Sinclair Road	Hoober Road	2	16,200	3,000	3,661	0.19	Yes	0.23	Yes
Sinclair Road	SR 111	English Road	2	16,200	600	1,504	0.04	Yes	0.09	Yes
	English Road	Brandt Road	2	16,200	600	1,504	0.04	Yes	0.09	Yes
	Brandt Road	Garst Road	2	16,200	600	1,597	0.04	Yes	0.10	Yes
	Garst Road	Gentry Road	2	16,200	600	1,759	0.04	Yes	0.11	Yes
Gentry Road	Sinclair Road	McKendry Road	2	16,200	700	862	0.04	Yes	0.05	Yes
	McKendry Road	Lindsey Road	2	16,200	700	862	0.04	Yes	0.05	Yes
	Lindsey Road	Young Road	2	16,200	700	862	0.04	Yes	0.05	Yes
Brandt Road	Sinclair Road	Hoober Road	2	16,200	150	312	0.01	Yes	0.02	Yes
SR 78/SR 86	SR 78/SR 86 Junction	Forrester Road	4	37,000	17,500	17,825	0.47	Yes	0.48	Yes

Intersection LOS with Construction Traffic

Peak hour construction trip generation estimates were added to existing traffic volumes at study intersections to develop existing plus construction condition volumes, as shown on **Figure 5.14-2**. The results of the intersection LOS assessment for existing and with construction traffic scenarios are presented below in **Table 5.14-6.** The assessment results indicate that all study intersections are projected to operate acceptably (LOS C or better) with the addition of construction traffic.

TABLE 5.14-6 CONSTRUCTION CONDITION INTERSECTION LOS RESULTS

Intersection	Traffic Control	Peak Hour	Existing Conditions		Construction Conditions	
			Delay	LOS	Delay	LOS
SR 111 & Sinclair Road	TWSC	AM	10.1	B	13.3	B
		PM	9.8	A	10.5	B
SR 111 and Main Street	AWSC	AM	12.1	B	15.4	C
		PM	10.9	B	15.2	C

Operations

No Impact. Based on the assessment, the addition of project-generated traffic during project operation would not cause a substantial increase in traffic volumes within the transportation system affecting the efficiency of the transportation system, including transit, roadway, bicycle, and pedestrian facilities. Therefore, the project would not conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities, resulting in no impact.

Operations Trip Generation

The applicant reports an estimated maximum of 61 workers would be employed at the project each working day. The nature of construction activity necessitates workers being physically on site, as opposed to working remotely; however, construction is conducted in phases of activity, each phase requiring different skills at different times. Therefore, it is reasonable to assume that not every worker would be on-site each working day. Workers may choose to carpool to the project. Trip generation estimates assume a 15 percent reduction in trips due to the potential for carpooling among coworkers, worker absences and remote work. This results in 104 daily worker trips occurring to and from the project, of which two-thirds would occur during the day shift and one-third would occur during the night shift. As a conservative assumption, it is assumed that all staff would arrive and depart during peak hours.

The applicant reports a total of 95 trucks are estimated to access the project each working day, resulting in 189 delivery/haul truck trips per day to support daily operations. It is assumed that truck trips would occur throughout the day during off-peak hours to the project. For the purposes of this assessment, truck trips were converted to passenger car trips using a passenger car cquivalence (PCE) ratio of 1.5 passenger cars per truck, consistent with HCM methodology. The resultant trip generation estimates for daily and peak hour operations trips are summarized below in **Table 5.14-7**.

TABLE 5.14-7 OPERATIONS TRIP GENERATION

		AM Peak Hour			PM Peak Hour		
Trip Type	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Delivery/Haul/Maintenance Trucks	189	0	0	0	0	0	0
Delivery/Haul/Maintenance Trucks PCE (1.5)	284	0	0	0	0	0	0
Workers	104	35	17	52	17	35	52
Total Operations and Maintenance Traffic in PCE	388	35	17	52	17	35	52

As reported in the AFC, the operations vehicle trip generation estimates are lower than those for peak construction traffic, so the project's effects on traffic would be correspondingly lower.

An assessment of the project's effects on roadway segment and intersection LOS is presented in the "5.14.2.3 Cumulative Impacts" subsection below.

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

Construction

Less Than Significant. During project construction, daily trips made by workers and delivery/haul trucks to and from the project would result in an increase in VMT. However, this increase in VMT would be temporary in nature, only lasting the duration of the construction phase. The proposed project's effect on VMT during construction would therefore not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b) and is considered to be a less than significant impact.

Operation

Less Than Significant. Based on the assessment, the project is estimated to generate a total of 104 daily operational trips to/from the project, which falls within the threshold defined in Section 5.14.2.1 for a project assumed to cause a less-than-significant transportation impact. Therefore, the proposed project's effect on VMT during operations would not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b) and is considered to be a less than significant impact.

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

Construction

No Impact. The project does not propose changes to any existing roadways or intersections during the construction phase.

Operation

No Impact. The project does not propose changes to any existing roadways or intersections during project operations.

Applicant-Proposed Mitigation

The applicant has proposed that the project be required to prepare a construction management plan (CMP), in response to the potential effect that heavy vehicle trips generated by the project would have on the existing roadway network. Staff has incorporated the applicant's proposed mitigation into Condition of Certification (COC) COC **TRANS-1**, to ensure conformance with applicable LORS.

d. Would the project result in inadequate emergency access?

Construction

Less Than Significant. Emergency vehicles would maintain right-of-way over construction vehicles. Construction activities would not prevent access for emergency vehicles. The

addition of project-generated traffic during construction along study roadways and at study intersections would have a negligible effect on emergency vehicles, as all vehicles are required to yield to emergency response vehicles.

Operation

Less Than Significant. Emergency vehicles would maintain right-of-way over project-related vehicles. Operational activities would not prevent access for emergency vehicles. The addition of project-generated traffic during normal operations along study roadways and at study intersections would have a negligible effect on emergency vehicles, as all vehicles are required to yield to emergency response vehicles.

5.14.2.3 Cumulative Impacts

Construction

Less Than Significant. Based on the assessment, the addition of project-generated traffic to the cumulative scenario during construction could cause the study intersections to degrade to a deficient level of service in the following peak hours:

- SR 111 & Sinclair Road
  - LOS D (29.9 seconds of delay) in the AM Peak Hour
- SR 111 & Main Street
  - LOS E (39.9 seconds of delay) in the AM peak hour
  - LOS D (32.0 seconds of delay) in the PM peak hour

However, any effect of project-generated traffic during construction would be temporary in nature and is not expected to result in any long-term effect to the transportation system.

Cumulative Project Trip Generation & Distribution

For cumulative traffic impacts, staff reviewed **Section 1 Executive Summary**, **Table 1-2.** The timing of these cumulative projects varies and is often uncertain. However, as reported in the AFC, the project shares a similar construction schedule with the proposed Black Rock and Elmore North Geothermal Projects. Construction activities are expected to overlap. Cumulative project trip generation estimates for average daily and peak hour construction trips are summarized below in **Table 5.14-8**.

TABLE 5.14-8 CUMULATIVE CONSTRUCTION PROJECT TRIP GENERATION

Project Name	Area Location	ADT	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Black Rock Geothermal Project	Imperial County	891	175	5	180	5	175	180
Elmore North Geothermal Project	Imperial County	1311	259	5	264	5	259	264
Total		**2202**	**434**	**10**	**414**	**10**	**434**	**414**

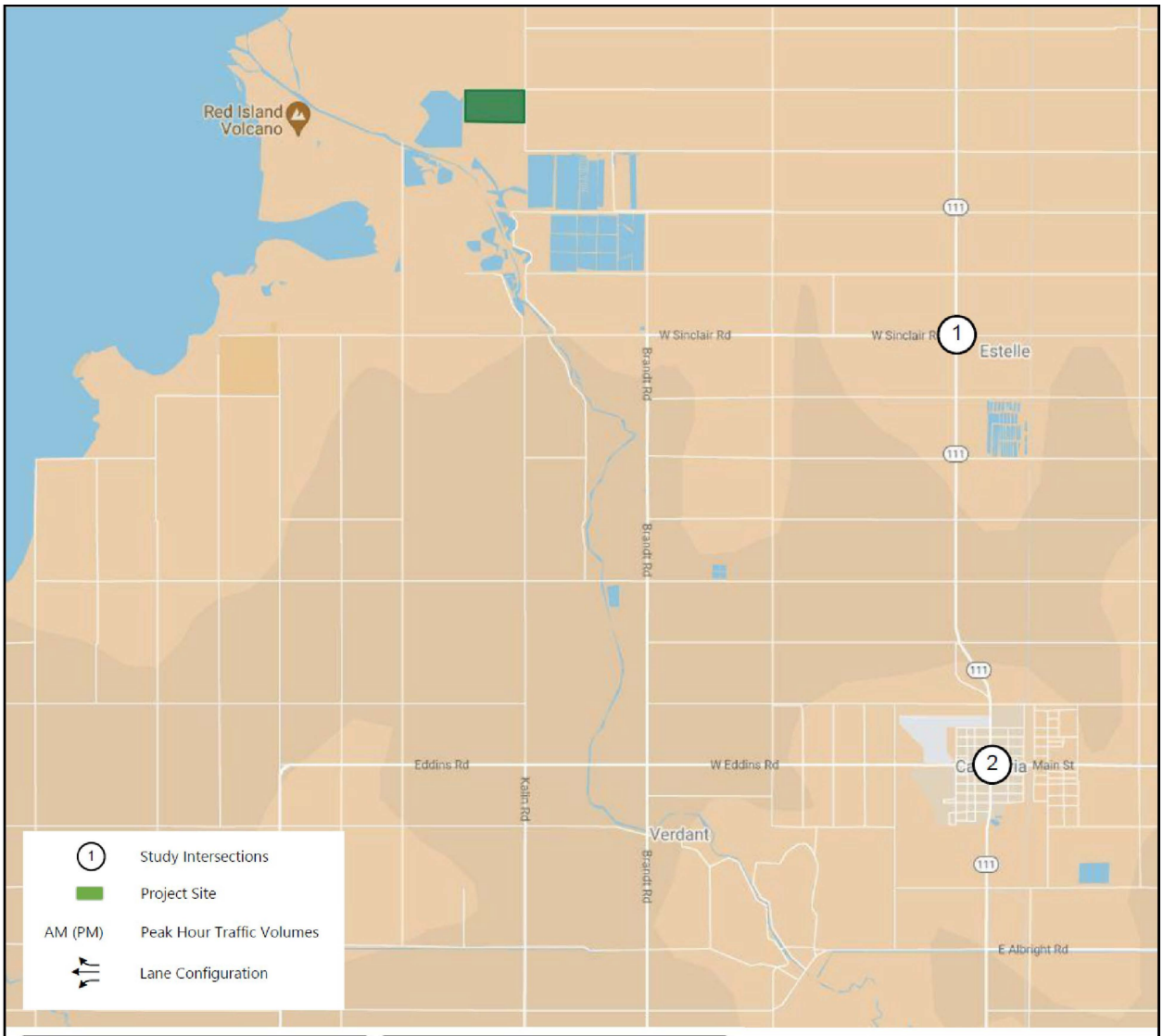
Trip distribution for the cumulative projects was developed using the same methods described in Section 5.14.2.2.

Roadway LOS with Cumulative Construction Traffic

Daily cumulative project construction trip generation estimates were added to the existing with construction traffic volumes presented in Section 5.14.2.2 to develop cumulative construction condition volumes, as shown on **Figure 5.14-3**. The resultant V/C ratio was then compared to the thresholds described in Section 15.14.2.1 to determine the project's effect on the roadway network under the cumulative scenario. The results of the roadway LOS assessment with cumulative construction traffic are presented below in **Table 5.14-9.** The assessment results indicate that all roadway segments are projected to operate acceptably (LOS C or better) with the addition of construction traffic in the cumulative scenario.

TABLE 5.14-9 CUMULATIVE CONSTRUCTION CONDITION ROADWAY SEGMENT LOS RESULTS

Roadway	Segment		# of Lanes	LOS E Cap	Existing Daily Volume	Const (Cum) Daily Volume	EX V/C	Const (Cum) V/C	LOS C or better?
	Between	And							
SR 111	Niland Avenue	McDonald Road	2	16,200	3,000	3,504	0.19	0.22	Yes
	McDonald Road	Sinclair Road	2	16,200	3,000	3,504	0.19	0.22	Yes
	Sinclair Road	Hoober Road	2	16,200	3,000	4,916	0.19	0.30	Yes
Sinclair Road	SR 111	English Road	2	16,200	600	3,222	0.04	0.20	Yes
	English Road	Brandt Road	2	16,200	600	3,222	0.04	0.20	Yes
	Brandt Road	Garst Road	2	16,200	600	3,490	0.04	0.22	Yes
	Garst Road	Gentry Road	2	16,200	600	3,961	0.04	0.24	Yes
Gentry Road	Sinclair Road	McKendry Road	2	16,200	700	1,171	0.04	0.07	Yes
	McKendry Road	Lindsey Road	2	16,200	700	1,171	0.04	0.07	Yes
	Lindsey Road	Young Road	2	16,200	700	1,171	0.04	0.07	Yes
Brandt Road	Sinclair Road	Hoober Road	2	16,200	150	621	0.01	0.04	Yes
SR 78/SR 86	SR 78/SR 86 Junction	Forrester Road	4	37,000	17,500	18,441	0.47	0.50	Yes



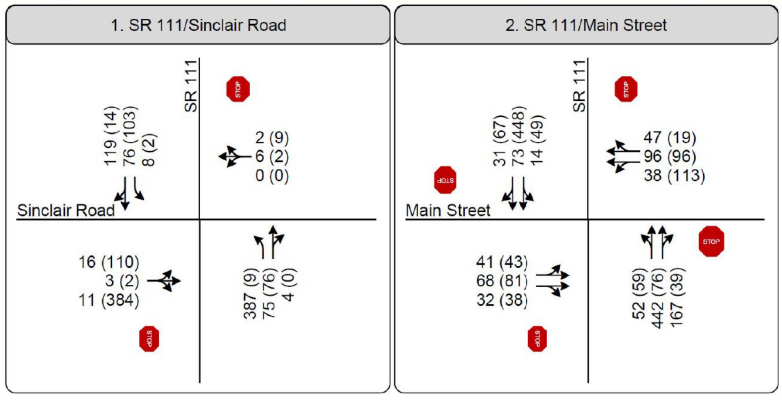


Figure 5.14-3
Peak Hour Traffic Volumes
Cumulative Construction Condition Volumes

Sources: Fehr & Peers

Intersection LOS with Cumulative Construction Traffic

Peak hour cumulative project construction trip generation estimates were added to the existing with construction traffic volumes at study intersections to develop cumulative construction condition volumes, as shown on **Figure 5.14-3**. The results of the intersection LOS assessment for existing and cumulative construction traffic scenarios are presented below in **Table 5.14-10.** The assessment results indicate that the addition of project-generated traffic to the cumulative scenario during construction could cause the study intersections to degrade to a deficient level of service in the following peak hours:

- SR 111 & Sinclair Road
  - LOS D in the AM Peak Hour
- SR 111 & Main Street
  - LOS E in the AM peak hour
  - LOS D in the PM peak hour

TABLE 5.14-10 CUMULATIVE CONSTRUCTION CONDITION INTERSECTION LOS RESULTS

Intersection	Traffic Control	Peak Hour	Existing Conditions		Construction (Cumulative) Conditions	
			Delay	LOS	Delay	LOS
SR 111 & Sinclair Road	TWSC	AM	10.1	B	29.9	D
		PM	9.8	A	17.0	C
SR 111 and Main Street	AWSC	AM	12.1	B	**39.9**	**E**
		PM	10.9	B	32.0	D

Operation

Less Than Significant. Based on the assessment, the addition of project-generated traffic to the cumulative scenario during project operations would not cause a substantial increase in traffic volumes within the transportation system affecting the efficiency of the transportation system, including transit, roadway, bicycle, and pedestrian facilities.

Cumulative Project Trip Generation & Distribution

For cumulative traffic impacts, staff reviewed **Section 1 Executive Summary**, **Table 1-2**. The timing of these cumulative projects varies and is often uncertain. However, an assessment was prepared conservatively assuming that the cumulative projects would operate simultaneously with the proposed project. Cumulative Project Trip Generation estimates for Daily and Peak Hour Operations Trips are summarized below in **Table 5.14-11**.

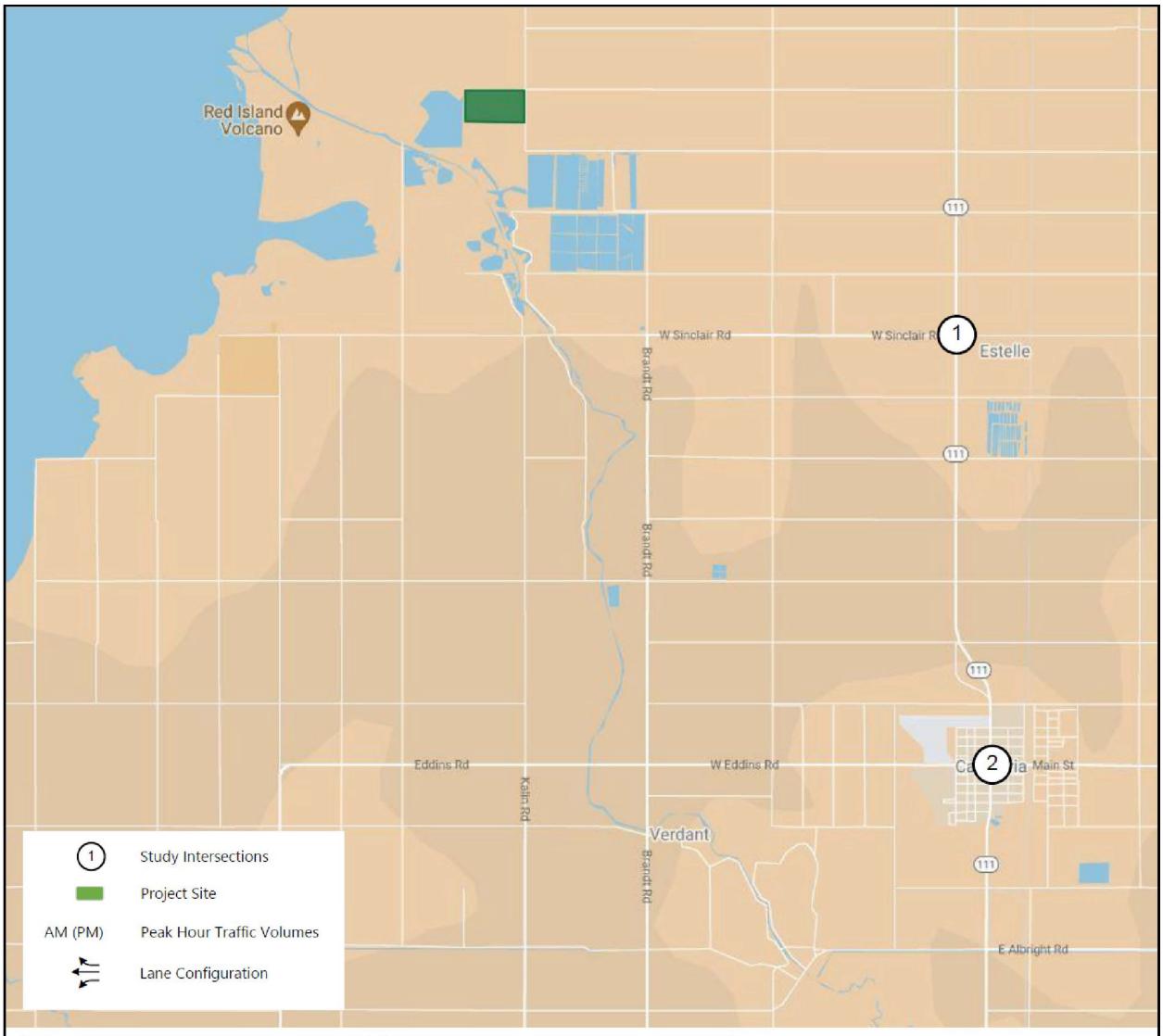
TABLE 5.14-11 CUMULATIVE OPERATIONS PROJECT TRIP GENERATION

Project Name	Area Location	ADT	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Black Rock Geothermal Project	Imperial County	293	35	17	52	17	35	52
Elmore North Geothermal Project	Imperial County	293	35	17	52	17	35	52
Hell's Kitchen Geothermal Exploration Project	Imperial County	377	126	63	189	63	126	189
Energy Source Mineral ALTiS	Imperial County	179	60	30	90	30	60	90
Total		**1142**	**256**	**127**	**383**	**127**	**256**	**383**

Trip distribution for the cumulative projects was developed using the same methods described in Section 5.14.2.2.

Roadway LOS with Cumulative Operational Traffic

As reported in the AFC, full scale commercial operation is expected to begin by June 2026. To account for the baseline 2026 traffic volumes the, existing (2022) volumes were grown by a factor of 2.5 percent per year to reflect the growth found between the base year and future year SCAG travel demand model. These volumes were utilized in the operational LOS scenarios. Daily cumulative project trip generation estimates from **Table 5.14-11** were added to the grown traffic volumes to develop opening year no project condition volumes. Project trips were then added to develop opening year plus project condition volumes, as shown on **Figure 5.14-4.** The resultant V/C ratio was then compared to the thresholds described in Section 15.14.2.1 to determine the project's effect on the roadway network under the cumulative scenario. The results of the roadway LOS assessment with cumulative operational traffic are presented below in **Table 5.14-12**. The assessment results indicate that all roadway segments are projected to operate acceptably (LOS C or better) with the addition of operational traffic in the opening year plus project scenario.



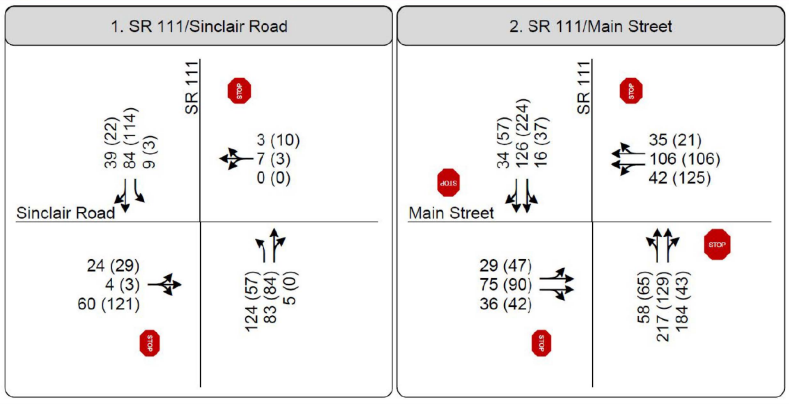


Figure 5.14-4
Peak Hour Traffic Volumes
Opening Year Plus Project Condition Volumes

Sources: Fehr & Peers

TABLE 5.14-12 CUMULATIVE OPERATIONS (OPENING YEAR) CONDITION ROADWAY SEGMENT LOS RESULTS

Roadway	Segment		# of Lanes	LOS E Capacity	Opening Year No Project Daily Volume	Opening Year plus Project Daily Volume	Opening Year No Project Conditions		Opening Year plus Project Conditions	
	Between	And					V/C	LOS C or better?	V/C	LOS C or better?
SR 111	Niland Avenue	McDonald Road	2	16,200	3,491	3,552	0.22	Yes	0.22	Yes
	McDonald Road	Sinclair Road	2	16,200	3,491	3,552	0.22	Yes	0.22	Yes
	Sinclair Road	Hoober Road	2	16,200	4,026	4,257	0.25	Yes	0.26	Yes
Sinclair Road	SR 111	English Road	2	16,200	1,653	1,970	0.10	Yes	0.12	Yes
	English Road	Brandt Road	2	16,200	1,653	1,970	0.10	Yes	0.12	Yes
	Brandt Road	Garst Road	2	16,200	1,755	2,104	0.11	Yes	0.13	Yes
	Garst Road	Gentry Road	2	16,200	1,933	2,339	0.12	Yes	0.14	Yes
Gentry Road	Sinclair Road	McKendry Road	2	16,200	948	1,005	0.06	Yes	0.06	Yes
	McKendry Road	Lindsey Road	2	16,200	948	1,005	0.06	Yes	0.06	Yes
	Lindsey Road	Young Road	2	16,200	948	1,005	0.06	Yes	0.06	Yes
Brandt Road	Sinclair Road	Hoober Road	2	16,200	343	400	0.02	Yes	0.02	Yes
SR 78/SR 86	SR 78/SR 86 Junction	Forrester Road	4	37,000	19,606	19,720	0.53	Yes	0.53	Yes

Intersection LOS with Cumulative Operational Traffic

As reported in the AFC, full scale commercial operation is expected to begin by June 2026. To account for the baseline 2026 traffic volumes the, existing (2022) volumes were grown by a factor of 2.5 percent per year to reflect the growth found between the base year and future year SCAG travel demand model. These volumes were utilized in the operational LOS scenarios. Peak hour cumulative project construction trip generation estimates from **Table 5.14-11** were added to the grown traffic volumes to develop opening year no project condition volumes. Project trips were then added to develop opening year plus project condition volumes, as shown on **Figure 5.14-4.** The results of the intersection LOS assessment for opening year and opening year plus project traffic scenarios are presented below in **Table 5.14-13**. The assessment results indicate that all study intersections are projected to operate acceptably (LOS C or better) with the addition of operational traffic in the opening year plus project scenario.

TABLE 5.14-13 CUMULATIVE OPERATIONS (OPENING YEAR) CONDITION INTERSECTION LOS RESULTS

Intersection	Traffic Control	Peak Hour	Opening Year No Project Conditions		Opening Year plus Project Conditions	
			Delay	LOS	Delay	LOS
SR 111 & Sinclair Road	TWSC	AM	11.9	B	12.6	B
		PM	10.4	B	10.8	B
SR 111 and Main Street	AWSC	AM	17.2	C	19.1	C
		PM	16.9	C	18.1	C

5.14.3 Project Conformance with Applicable LORS

Table 5.14-14 contains staff's determination of conformance with applicable local, state and federal LORS, including any proposed COC, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific conditions of certification, the proposed project would be consistent with all applicable LORS. The subsection below, "Staff Proposed Conditions of Certification," contains the full text of the referenced COCs.

TABLE 5.14-14 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
Federal	
Code of Federal Regulations	
Title 49 CFR, Subtitle B, Sections 171-177 and 350-399 Requires proper handling and storage of hazardous materials during transportation.	**Yes.** The project transportation would align with all established standards for the transportation of hazardous materials. See **TRANS-2**.
Title 14 CFR, Part 77, Section 77.9 Requires notification of the Federal Aviation Administration (FAA) of any construction or alterations exceeding 200 feet above ground level. Also requires FAA notification of any construction or alteration of greater height than an imaginary surface extending outward and upward at a slope of 100 to 1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway of an airport with at least one runway more than 3,200 feet in length.	**Yes.** Construction would not exceed 200 feet above ground level and no airports are situated within 20,000 feet of the project; consequently, this requirement does not apply.
State	
California Vehicle Code (CVC)	
CVC Sections 13369, 15275, and 15278 Addresses the licensing of drivers and classifications of licenses required for the operation of particular types of vehicles. In addition, certificates permitting the operation of vehicles transporting hazardous materials are required.	**Yes.** The project would follow the guidelines specified in these sections of the CVC. See **TRANS-3**.
CVC Section 25160 et seq. Addresses the safe transport of hazardous materials.	**Yes.** The project would follow the guidelines specified in these sections of the CVC.

TABLE 5.14-14 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
CVC Sections 2500-2505 Authorizes the issuance of licenses by the Commissioner of the CHP for the transportation of hazardous materials including explosives.	**Yes.** The project would follow the guidelines specified in these sections of the CVC.
CVC Section 31300 et seq. Requires transporters to meet proper storage and handling standards for transporting hazardous materials on public roads.	**Yes.** Transporters would comply with standards for the transportation of hazardous materials on state highways throughout construction and operations. The State Emergency Response Commission (SERC) would ensure adherence to CVC Section 31303, mandating that shippers of hazardous materials opt for the shortest route possible to and from the site.
CVC Sections 31600 - 31620 Regulates the transportation of explosive materials.	**Yes.** The project would conform to CVC §31600 – 31620.
CVC Sections 32000 - 32053 Regulates the licensing of carriers of hazardous materials and includes noticing requirements.	**Yes.** The project would conform to CVC §31600 – 31620.
CVC Sections 32100 - 32109 and 32105 Establishes special requirements for the transportation of substances presenting inhalation hazard and poisonous gases, and require that shippers of inhalation or explosive materials contact the CHP and apply for a Hazardous Material Transportation License.	**Yes.** The project would comply by mandating shippers of inhalation or explosive materials to reach out to the CHP and secure a Hazardous Materials Transportation License.
CVC Sections 34000 - 34121 Establishes special requirements for the transportation of flammable and combustible fluids over public roads and highways.	**Yes.** The project would conform to CVC §§34000 – 34121.
CVC Sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5–7, 34506, 34507.5 and 34510–11 Regulates the safe operation of vehicles, including those used to transport hazardous materials.	**Yes.** The project would follow the guidelines specified in these sections of the CVC.
CVC Sections 35780 Requires permits for any load that exceeds Caltrans weight, length, or width standards for public roadways.	**Yes.** Transporters would secure transportation permits for all overloads, as mandated.
CVC Sections 35550 - 35559 Regulates weight and load limitations.	**Yes.** The project would follow the guidelines specified in these sections of the CVC.
California Streets and Highways Code	
S&HC Sections 660, 670, 1450, 1460 et seq., 1470, and 1480 Regulates right-of-way encroachment and the granting of permits for encroachments on State and County roads.	**Yes.** The project will follow the guidelines specified in these sections of the S&HC.
S&HC Sections 117, 660 - 711 Requires permits from Caltrans for any roadway encroachment during truck transportation and delivery.	**Yes.** Encroachment permits would be obtained by transporters, as required.
S&HC Sections 660 - 711 Requires permits for any load that exceeds Caltrans weight, length, or width standards for public roadways.	**Yes.** Transportation permits would be obtained by transporters for all overloads, as required.
California State Planning Law	

TABLE 5.14-14 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
Government Code, Section 65302 Requires that the project must conform to the General Plan.	**Yes.** The project would align with the provisions of the Imperial County's General Plan.
Local	
Imperial County Municipal Code	
Section 10.12 Regulates and permits vehicle weight and load limitations. Within Imperial County, transportation permits for operating any oversize or overweight vehicles are required. Oversize or overweight are defined as any vehicle or combination of vehicles or special mobile equipment that exceeds the size or weight specified in Sections 35000 through 35796 of the CVC. The maximum gross weight for a vehicle is 80,000 pounds. The maximum axle weight for a single axle is 20,000 pounds. A permit from Imperial County would allow vehicles to use the streets approved in the permit application. Specific truck routes within the County are not identified.	**Yes.** The project would comply with these sections of Imperial County Municipal Code.
Imperial County General Plan	
Circulation and Scenic Highways Element Specifies long-term planning goals and procedures for transportation infrastructure system quality within Imperial County.	**Yes.** No substantial impact on the County's traffic and transportation infrastructure will be caused by the project.

5.14.4 Conclusions and Recommendations

As discussed above, with implementation of COCs, the project would have a less than significant impact related to transportation and would conform with applicable LORS. CEC staff recommends adopting the conditions of certification as detailed in subsection "5.14.5 Proposed Conditions of Certification" below.

5.14.5 Proposed Conditions of Certification

The following proposed COCs include measures to both mitigate environmental impacts and ensure conformance with applicable LORS. The COCs below are enforceable as part of the CEC's certificate for the portions of the project constituting the site and related facilities. Additional impacts associated with project components outside of the CEC's jurisdiction, such as the well complex licensed by CalGEM and permitted by Imperial County, the temporary structures such as the construction camps, laydown/parking yards, and borrow pits to be permitted by Imperial County, and the switching station to be permitted by IID, require mitigation to be less than significant.

This CEQA analysis evaluates all impacts resulting from all aspects of the project, and for the entire project to have less than significant impacts, the mitigation actions described in these COCs would need to be implemented by the various licensing jurisdictions as mitigation measures (MMs). For purposes of the facility certification issued by the CEC, the applicant must comply with the following COCs on the jurisdictional site and related

facilities as delineated in the **Section 3.1 Project Description**. Verifications set forth below only apply to the COCs, not the MMs.

COC TRANS-1/ MM TRANS-1 The project owner shall prepare and implement a Construction Management Plan (CMP). The CMP shall address the movement of workers, vehicles, equipment, and materials, including arrival and departure schedules, carpooling, a parking/staging plan, and designated workforce and delivery routes. Traffic control plans shall be prepared as necessary to address construction staging, as well as any roadway or lane closures and shall include any signage or roadway lighting improvements deemed necessary during construction. The CMP shall address means of access for emergency vehicles to the project, as well as means of maintaining access to any adjacent residential and commercial property during the construction of the project.

The CMP shall include procedures to restore damages to existing roadways caused by project construction traffic. The construction contractor shall work with Imperial County and Caltrans to prepare a schedule and mitigation plan for the roadways along construction routes, in accordance with the procedures established by the CMP.

Verification: At least 60 calendar days prior to the start of construction, the project owner shall submit the CMP to Caltrans and Imperial County for review and comment and to the compliance project manager (CPM) for review and approval. The project owner shall also provide the CPM with a copy of the transmittal letter to Caltrans and Imperial County requesting review and comment.

At least 30 calendar days prior to the start of construction, the project owner shall provide copies of any comment letters received from Caltrans or Imperial County, or any other interested agencies, along with any changes to the CMP, for CPM review and approval. After CPM review and approval, the project owner shall provide completed copies of the final CMP to Caltrans and Imperial County and any other interested agencies, sending copies of the correspondence to the CPM.

COC TRANS-2/MM TRANS-2 The project owner shall comply with limitations imposed by Caltrans and other relevant jurisdictions, including the County of Imperial, on vehicle sizes, weights, driver licensing, and truck routes.

Verification: The project owner shall retain copies of permits and supporting documents on-site for CPM inspection if requested.

CEC TRANS-3/MM TRANS-3 The project owner shall ensure that permits and/or licenses are secured from the relevant administering agency, including California Highway Patrol and Caltrans for the transport of hazardous materials.

Verification: The project owner shall include in its Monthly Compliance Reports (MCR's) copies of all permits/licenses acquired by the project owner and/or subcontractors concerning the transport of hazardous substances.

5.14.6 References

Jacobs 2023a – Jacobs (TN 249723). Morton Bay Geothermal Project Application for Certification, Volume 1, dated April 18, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Jacobs 2023f – Jacobs (TN 249728). Morton Bay Geothermal Project AFC Volume 2, Appendix 2 Project Description, dated April 18, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Jacobs 2023g – Jacobs (TN 249729). Morton Bay Geothermal Project AFC Volume 2, Appendix 1 Executive Summary, dated April 18, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

Jacobs 2023bb – Jacobs (TN 252491-1 through TN 252491-8). Morton Bay Geothermal Project Data Request Response Set 1, dated October 3, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-AFC-01

TRB 2016 - Transportation Research Board (TRB). "Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis, 2016." Accessed on: November 1, 2023. Accessed online at: https://www.trb.org/publications/hcm6e.aspx

OPR 2018 - Office of Planning and Research. "TECHNICAL ADVISORY - ON EVALUATING TRANSPORTATION IMPACTS IN CEQA." Adopted December 2018. Accessed on: November 5, 2023. Accessed online at: https://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf

TRB 1980 – Transportation Research Board. "INTERIM MATERIALS ON HIGHWAY CAPACITY". Adopted October 8, 1980. Accessed on: November 1, 2023. Accessed online at: http://onlinepubs.trb.org/Onlinepubs/trcircular/212/212.pdf

5.15 Visual Resources

Mark R. Hamblin

5.15.1 Environmental Setting

Existing Condition

The proposed project would be constructed on a 51-acre portion of a 160-acre parcel of relatively flat land in a rural area in the northern part of the Imperial Valley in Imperial County, California. The project site is currently shrubland.

In the vicinity of the project site is agriculture, geothermal power generation-related operations, open space, wildlife habitat, and a freshwater lake and barren lakebed (the Salton Sea).

The Red Hills are about one and three quarters mile to the west of the project site. The Salton Sea is a little farther. The Alamo River is less than three quarters mile to the southwest. California Route 111 is about three- and three-quarter miles to the east. Niland, a census-designated place (population 756) is about four miles to the northeast, and the city of Calipatria six miles to the southeast.

Regulatory

Federal, state, and local government laws, ordinances, regulations, and standards (LORS) about aesthetics and visual resources applicable to the proposed project and project site are set forth below.

Federal

No federal regulations related to aesthetics/visual resources were found.

State

California Scenic Highway Program. The California Scenic Highway Program was established by the Legislature as Article 2.5 (commencing with section 260) of the Streets and Highways Code. The purpose of the program is to protect and enhance the natural scenic beauty of California highways and adjacent corridors, through special conservation treatment.

Section 263 of the Streets and Highways Code, the "State Scenic Highway System List" provides a list of highways that have been either officially designated or are eligible for designation as a State scenic highway. The project site is not shown along a designated State scenic highway. The list shows a segment of northbound California Route 111 starting at Bombay Beach in Salton Sea State Park designated as a State scenic highway. This segment is approximately 14 miles north of the project site.

Local

Imperial County General Plan, Land Use Element. The primary purpose of the Land Use Element is to identify the goals, policies, and standards of the General Plan that will guide the physical growth of Imperial County (Imperial County 2015b).

The Imperial County General Plan, Land Use Plan map shows the project site in the Agriculture land use designation (Imperial County 2024).

> "This category is intended to preserve lands for agricultural production and related industries including aquaculture (fish farms), ranging from light to heavy agriculture. Packing and processing of agricultural products may also be allowed in certain areas, and other uses necessary or supportive of agriculture. The Agriculture category includes most of the central irrigated area known as the Imperial Valley, the Bard/Winterhaven Valley and the south end of the Palo Verde Valley." (Imperial County 2024)

Imperial County General Plan, Conservation and Open Space Element. The Conservation and Open Space Element states the following related to visual resources:

> "The County's visual character varies greatly. It includes natural scenic visual resources such as deserts, sand dunes, mountains, and the Salton Sea. Many of the natural scenic resources are located on land under Bureau of Land Management (BLM) jurisdiction. County areas for BLM-managed lands are shown on Figure 9 and depict the values of the County's visual resources based on their Visual Resource Inventory (VRI) process. Areas with a moderate to high value for maintenance of visual quality could represent opportunities for conservation and open space areas. Although these areas are within BLM lands, private inholdings under the County's jurisdiction may be available for conservation or open space designations. The County also includes agricultural areas and built environments such as urban areas and solar, wind, and geothermal energy development. …
>
> The Salton Sea is in the northwestern portion of the County and extends into Riverside County, measuring 35 miles in length and a surface area of approximately 376 square miles. The Salton Sea has been sustained by agricultural drainage from the Imperial, Coachella, and Mexicali valleys; rainfall; storm runoff from the surrounding mountains; and groundwater inflow. The area represents an important wildlife habitat area and provides migrating and wintering habitat for thousands of waterfowl and other birds. Masses of these birds are visible from the shores of the Salton Sea. This waterbody represents a unique visual resource because of its size, its location in a desert area, and its value to wildlife." (Imperial County 2016, pp. 27-28)

Imperial County General Plan, Renewable Energy and Transmission Element. The Renewable Energy and Transmission Element provides a framework for the review and approval of renewable energy projects in the County.

The Element shows the project site within a "Known Geothermal Resources Area" (KGRA) identified as the Salton Sea KGRA. The following statement under "Aesthetics" serves as a basis for the Goals and Objectives contained in Chapter III of this Element.

> "Aesthetics
>
> The visual character of Imperial County varies greatly, consisting of natural scenic visual resources such as deserts, sand dunes, mountains, recreation areas, and the Salton Sea. Visual character of Imperial County varies greatly, consisting of natural scenic visual resources such as deserts, sand dunes, mountains, recreation areas, and the Salton Sea. The visual character of Imperial County also includes agricultural areas, urban areas, and areas of solar development. Development of renewable energy facilities would have the potential to impact existing visual character and quality, including scenic vistas, natural environment and existing landscape, general built environment and historic buildings, and scenic highways. Renewable energy facilities may also create new sources of substantial light or glare which would adversely affect day or nighttime views in the area.
>
> Future projects would need to evaluate whether their location in relation to key observation areas would impact the existing aesthetics of the surrounding area. Much of the County is visible from major roadways, and potential impacts to existing visual resources from proposed alternative energy projects would need to be considered during siting, planning, and design. Although no highways in Imperial County are designated as state scenic highways, the routes considered eligible for designation are still recognized and would need to be taken into consideration for planning renewable energy projects. Recreational areas with scenic qualities such as the Salton Sea and Picacho State Recreation Area would need to be considered when siting potential renewable energy projects. Furthermore, future projects would also need to be evaluated for compatibility with current visual resource ratings assigned to BLM-managed lands." (Imperial County 2015c, p. 17)

Imperial County Codified Ordinances. The Imperial County Zoning Map 54 – Red Hill Area shows the project site is zoned S-1-G (Open Space/Recreational Zone-Geothermal Overlay).

S-1 (Open Space/Recreational) Zone. "The purpose of the S-1 zone is to designate areas that recognize the unique Open Space and Recreational character of Imperial County including the deserts, mountains and waterfront areas. Primarily the S-1 Zone is characterized by low intensity human utilization and small-scale recreation related uses." (Imperial County 2023, Division 5, Chapter 18, section 90518.00) S-1 uses granted only with a conditional use permit include:
"n) Major facilities relating to the generation and transmission of electrical energy provides such facilities are not under State or Federal law, to approved exclusively by an agency, or agencies of the State or Federal government, and provided such facilities shall be approved subsequent to coordination review of the Imperial Irrigation District for electrical matters." (Imperial 2023, Division 5, section 90518.02.n)

G (Geothermal Overlay) Zone. A Geothermal Overlay district zone has been attached to the S-1 zone (base zone) "In order to further refine, classify, regulate, restrict and segregate the use of land and buildings; to regulate and restrict the high bulk and construction of building; regulate the area of yards and other open space around buildings and to regulate intensity of land uses and the density of population...." (Imperial County 2023, Division 5, section 90501.03)

The Renewable Energy Overlay Map shows the project site in an area designated Renewable Energy/Geothermal. (Imperial County 2023, Division 17, section 91701.02)

"The Renewable Energy (RE) Overlay Zone consists of two categories as shown on the RE Overlay Map: 1) the Geothermal Energy overlay for areas where existing and future development has been environmentally reviewed for geothermal renewable energy facilities; and 2) the Renewable/Geothermal overlay for areas that could be developed with any form of renewable energy technology, including geothermal production. Land classified in some other (non-overlay) zone may also be classified in the "RE" Renewable Energy Overlay Zone…" (Imperial County 2023, Division 17, section 91701.01)

The staff discusses the conformance of the project with applicable LORS in subsection 5.15.3 Project Conformance with Applicable LORS.

Cumulative

Section 1 Executive Summary, **Table 1-2** indicates several projects are within an approximate three-mile distance zone from the Morton Bay Geothermal Project (MBGP). Impacts from these projects could potentially combine with impacts by the MBGP causing a significant cumulative impact.

- Black Rock Geothermal Project – geothermal project
- Elmore North Geothermal Project – geothermal project
- Energy Source Mineral ATLiS Project – commercial lithium hydroxide production plant
- Hell's Kitchen – geothermal project
- Lindsey Solar – solar project
- Midway IV – solar project
- Ormat Wister – solar project
- Wilkinson Solar – solar project

5.15.2 Environmental Impacts

AESTHETICS Except as provided in Public Resources Code Section 21099[1], would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☒	☐	☐

California Code of Regulations, Title 14, Division 6, Chapter 3, Article 20 Appendix G Environmental Checklist Form, I. Aesthetics amended December 28, 2018.

In accordance with Public Resource Code section 21099, staff has determined the project is not an employment center project on an infill site within a transit priority area. A transit priority area is an area within a half-mile (2,640 feet) of a major transit stop. Staff viewed current Google Earth aerial and street view imagery and found no major transit stop in the vicinity.

5.15.2.1 Methodology and Thresholds of Significance

The California Energy Commission (CEC) evaluates a proposed project in accordance with the California Environmental Quality Act (CEQA) codified in California Public Resources Code (Pub. Res. Code) section (§) 21000 et sequentes (et seq.), and the Guidelines for the Implementation of the California Environmental Quality Act (CEQA Guidelines) codified in the California Code of Regulations (CCR), Title 14 § 15000 et seq.

The CEQA Guidelines state "Effects analyzed under CEQA must be related to a physical change." (14 CCR § 15358[b])

1 Public Resources Code section 21099 asks is the proposed project an "employment center project" on an "infill site" within a "transit priority area" as defined in this section? A transit priority area is an area within a half-mile (2,640 feet) of a major transit stop existing or planned. Public Resources Code section 21099(d)(1) states, "Aesthetic and parking impacts of a residential, mixed-use residential, or employment center project on an infill site within a transit priority area shall not be considered significant impacts on the environment."

The CEQA Guidelines also state a "'Significant effect on the environment' means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance [emphasis added]." (14 CCR § 15382)[2]

What exactly is an "object of aesthetic significance" is not defined in CEQA or the CEQA Guidelines. An object of aesthetic significance can be explained as an object subjectively designated by the federal, state, or local government and unique to it. Also, an undesignated but popularly used or appreciated area or object of aesthetic claim of significance is considered. A tour book guide and road atlas in the area (e.g., AAA, Rand McNally) and Wikipedia are helpful. A California court has said a lead agency may look to local planning thresholds when defining the visual impact standard for the purpose of CEQA[3] (e.g., general plan, specific plan, zoning). A few often-designated objects of aesthetic significance at the national, state, and local government levels have included:

- A geographic feature; geologic distinguishing characteristic, geomorphologic feature.
- A structure that embodies elements of architecture or engineering design, detail, materials or craftsmanship that represent a significant innovation or is unique.
- A structure of unusual historical and usually aesthetic interest.
- A tree or group of trees recognized for their aesthetic, botanical, and ecological value, and/or age, rarity, and size.
- A landscape architecture or designed landscape.

The potential physical change by the proposed project to an existing object of aesthetic significance in the area and the existing physical environment is what is analyzed.

The CEC must assess "... the physical environmental conditions in the vicinity of the project. This environmental setting will normally constitute the baseline physical conditions by which a lead agency [4] determines whether an impact is significant." (14 CCR § 15125[a])

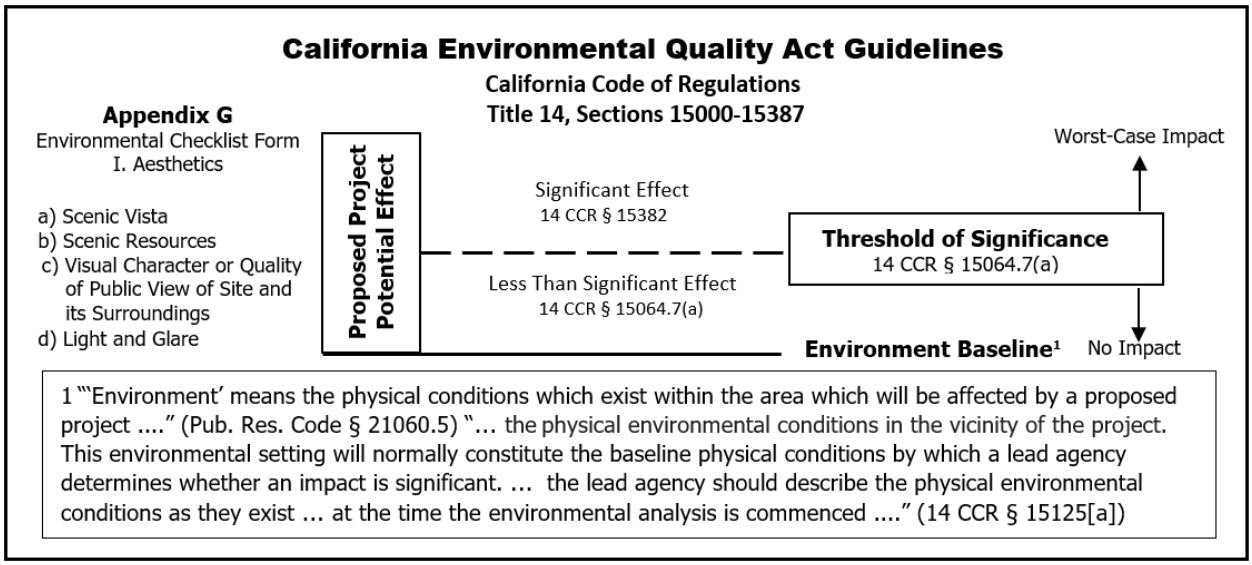
"An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency ... is to be reviewed in the light of what is reasonably feasible .... The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure." (14 CCR § 15151)

Environmental Factor – Aesthetics

The CEQA Guidelines *Appendix G Environmental Checklist Form, I. Aesthetics* (shown in the table above) supplies questions to answer when evaluating if a proposed project has

2 In addition to 14 CCR § 15382 also stated in 14 CCR § 15360 and Public Resources Code § 21060.5.
3 *Mira Mar Mobile Community v. City of Oceanside* (2004) 119 Cal. App. 4th 477.
4 "'Lead agency' means the public agency which has the principal responsibility for carrying out or approving a project." (14 CCR § 15367)

a significant effect on the environment involving the environmental factor "Aesthetics." The staff answers to the questions are provided under the subheadings Scenic Vista, Scenic Resources, Visual Character or Quality of Public View of Site and its Surroundings, Light and Glare in the Direct and Indirect Impacts section.



Staff Method

Staff evaluates (1) the alteration to the existing *landscape* [5] by a proposed *project* [6] using the California Environmental Quality Act Guidelines, Appendix G, I. Aesthetics;[7] and (2) the conformance of the proposed project with aesthetic and visual resources related LORS in accordance with Public Resources Code section 25525.

Completing an assessment entails examining aerial and street view imagery, GIS data, site and vicinity photographs, the photograph at the key observation point, the photo-realistic simulation of the project in the landscape, elevations, and site development plans; review of applicable federal, state, and local government codes and regulations, maps and plans, tour book guides, road atlases, and often a visit to the project site, key

5 Landscape is defined as "The outdoor environment, natural or built, which can be directly perceived by a person visiting and using that environment. A scene is the subset of a landscape which is viewed from one location (vantage point) looking in one direction." (Hull and Revell 1989) "The term landscape clearly focuses upon the visual properties or characteristics of the environment, these include natural and man-made elements and physical and biological resources which could be identified visually; thus non-visual biological functions, cultural/historical values, wildlife and endangered species, wilderness value, opportunities for recreation activities and a large array of tastes, smells and feelings are not included." (Daniel and Vining 1983; Amir and Gidalizon 1990)

6 A thermal or nonthermal generating facility with a capacity of 50-megawatts or more. An energy storage facility with a capacity of 200-megawatt hours or more. (See Pub. Res. Code § 25120 and 25545-25545.2)

7 California Code of Regulations, Title 14, Division 6, Chapter 3, Article 20 Appendix G Environmental Checklist Form, I. Aesthetics amended December 28, 2018.

observation point, and surrounding area to determine the CEQA Guidelines level of effect on the environment and conformance with LORS by the project.

5.15.2.2 Direct and Indirect Impacts

Scenic Vista

a. Would the project "[h]ave a substantial adverse effect on a scenic vista?"

Less Than Significant Impact. Neither CEQA nor the CEQA Guidelines provide a definition of what constitutes a scenic vista. As already noted, lead agencies often look to local planning thresholds for guidance when defining the visual impact standard for the purposes of CEQA.[8] A general plan, specific plan, zoning, or other planning document can provide guidance. The CEC in its certification (approval) for several thermal power plant projects has used as the definition for a *scenic vista*, "a distant view of high pictorial quality perceived through and along a corridor or opening."[9]

In this definition, "... perceived through and along a corridor or opening" refers to the potential movement into or through a portion of landscape limited by either elevated landforms bounding the observer's field of view in a rural landscape, or dominant man-made horizontal and/or vertical massed components[10] at regular intervals bounding the observer's field of view in an urban landscape. No specific observer locations form the basis for the visual unit boundary. Usually, a distinct change in the extent and direction of views from the ground is the determining factor. The space within it inherently variable in appearance having its own distinct visual character. The scenic distinction created by the combination of components within and bounding it enable the viewer to accumulate and form a unified impression (e.g., breathtaking, stunning, unsettling, repulsive). An example of a scenic vista in a rural landscape would include the view through and along the Yosemite Valley from the Wawona Tunnel overlook in Yosemite National Park, California. Two examples in an urban landscape would be the view through and along the National Mall from the Washington Monument in Washington, D.C. Also, the view through and along Capitol Mall from the Tower Bridge to the California State Capitol building in Sacramento, California.

8 *Mira Mar Mobile Community v. City of Oceanside* (2004) 119 Cal. App. 4th 477.

9 California Energy Commission Final Decision for GWF Tracy Combined Cycle Power Plant Project Docket Number 08-AFC-7, Visual Resources, p. 321; California Energy Commission Decision for Mariposa Energy Project Docket Number 09-AFC-3, Visual Resources, p. 5; California Energy Commission Decision for Blythe Solar Power Project Docket Number 09-AFC-6, Visual Resources, p. 514; California Energy Commission Decision for Genesis Solar Energy Project Docket Number 09-AFC-8, Visual Resources, p. 7-8; California Energy Commission Decision for Pio Pico Energy Center Docket Number 11-AFC-01, Visual Resources, p. 8.5-4.

10 A "component" is an individual object that makes up the landscape, physical and visible, natural and man-made which can be described, quantified, and measured.

Once a scenic vista is identified, an adverse effect is presumed when a sizable component(s) of the project physically changes the scenic vista (e.g., obstruct).

Construction and Operation

Less Than Significant Impact. The Imperial County General Plan Land Use Element and the Conservation and Open Space Element do not show a scenic vista or have an applicable general plan policy pertaining to a scenic vista that includes the project site and the surrounding area. In addition, staff did not find a county ordinance designating a scenic vista that includes the project site.

Staff reviewed current aerial and street view imagery (Google Earth, Google Maps), area maps, and concluded the project would be on a "Basin Floor"- nearly level to gently sloping, bottom surface of an intermontane basin, the northern Imperial Valley floor, and not within a scenic vista as defined.

The construction and operation of the project would have a less than significant effect on the environment to a scenic vista.

Scenic Resources

b. Would the project "[s]ubstantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?"

Neither CEQA nor the CEQA Guidelines provide a definition of what constitutes a scenic resource. A scenic resource in addition to being designated in an adopted federal, state, or local government planning document, plan, or regulation, as suggested in the above aesthetics question may be explained as a widely recognized natural or man-made feature tangible in the landscape. Hence a scenic resource includes but is not limited to the following:

- A natural feature or object that is part of the land, such as a geologic distinguishing characteristic (e.g., batholith, laccolith, mesa), a geomorphologic feature produced from deposition or erosion (e.g., gorge, inselberg, moraine). A water body (e.g., lake, waterway, estuary). A tree recognized for its aesthetic, botanical, and ecological value, or age, rarity, and size.
- A man-made feature or object that embodies elements of architecture or engineering design, detail, materials, or craftsmanship that represent a significant innovation or is unique, such as the California State Capitol, Golden Gate Bridge, Hollywood sign.
- A cultural resource,[11] historic property or landmark may be included. It should be recognized that cultural and historic values differ from aesthetic or scenic values (e.g., elegance, harmonious, imposing, sublime).

11 Cultural resources encompass all the physical evidence of past human activity. These could include buildings, structures, engineering features; prehistoric sites; historic or prehistoric artifacts or objects.

This analysis evaluated if the project would substantially damage—eliminate or obstruct—*public view* [12] of a scenic resource. Also, would the project be situated so that it changes the visual appearance of a scenic resource by being in sharp contrast? Staff used a three-mile[13] distance zone surrounding the project site for this analysis.

Construction and Operation

Less Than Significant Impact. "The County's visual character varies greatly. It includes natural scenic visual resources such as deserts, sand dunes, mountains, and the Salton Sea. Many of the natural scenic resources are on land under Bureau of Land Management (BLM) jurisdiction." (Imperial County 2016, pp. 27 to 28) The project is not on land under the jurisdiction of the BLM.

The staff review of the Imperial County General Plan Land Use Element and the Conservation and Open Space Element concluded there is no designated and protected scenic resource on the site or in the vicinity of the project site. A county ordinance identifying a specific scenic resource on the project site or in the vicinity was not found.

Staff also reviewed current aerial and street view imagery (Google Earth, Google Maps), area maps, a tour book guide, road atlas, Wikipedia, and did not find a scenic resource on the project site, but staff did identify a few considerations in the vicinity.

The Davis-Schrimpf carbon dioxide seep is at the corner of Davis and West Schrimpf roads bordering the project site to the east. It has several active mud pots. A mud pot is a mound of mud heaved up through overlaying sediments. Mud pots are not unusual in volcanic active areas. The mud temperature inside the pot can exceed 500 degrees Fahrenheit. The mud pots look like piles of soil (dirt) dumped or stored in a pasture. There are about 12-15 mud pots, some five feet tall. The mud pots are on private property owned by River Ranch Incorporated. No trespassing signs are posted. At times people park and view the mud pots from Davis Road. The project would not eliminate or obstruct the public view of the mud pots from Davis and West Schrimpf roads nor change the visual appearance of the mud pots.

These nonrenewable resources often yield unique information about past societies and environments and provide answers for modern day social and conservation problems. (NRCS 2024)

12 A public view can be defined as the area visible from a location where the public has a legal and physical right of access to real property (e.g., city sidewalk, public park, town square, state highway). California Code of Regulations, Title 14, Division 6, Chapter 3, Article 20 Appendix G Environmental Checklist Form, I. Aesthetics c. states "Public views are those that are experienced from publicly accessible vantage point." The California Courts of Appeal, Fourth District wrote "Under CEQA, the question is whether a project will affect the environment of persons in general, not whether a project will affect particular persons." (*Mira Mar Mobile Community v. City of Oceanside* (2004) 119 Cal. App. 4th 477.)

13 "Based on the curve of the Earth: Standing on a flat surface with your eyes about 5 feet off the ground, the farthest edge that you can see is about 3 miles away." (Healthline 2023)

The Salton Sea is a terminal sea approximately 343 square miles about two miles west of the project. The sea is a man-made feature that resulted in a shallow, landlocked, highly saline body of water. The sea (lake) has been sustained by agricultural drainage from the Imperial, Coachella, and Mexicali valleys; rainfall; storm runoff from the surrounding mountains; and groundwater inflow. "The sea is not safe for swimming, boating or fishing." (Newburger 2021) The sea is shrinking. Its drying lakebed reportedly emits toxic dust. Area surrounding the lake provides habitat for hundreds of bird species. The project would not eliminate or obstruct a public view of the Salton Sea nor change its visual appearance.

The Salton Buttes are a group of lava domes that lie along the southeastern shore of the Salton Sea, a little less than two miles to the west of the project site. The buttes are five lava domes that rise -100 to -190 feet[14] above the surrounding terrain in an approximate four-mile-long row. The five buttes are named North Red Hill, South Red Hill (The Red Hills), Rock Hill, Obsidian Butte, and Mullet Island. The buttes are closely associated with a fumarolic field and a geothermal field. The buttes were formed by viscous lava rising in a volcanic vent 820 feet wide eons ago.

The Red Hills (elevation -125 to -135 feet) are about one and three quarters mile to the west of the project site. The hills have a sizable portion that has been quarried. Ten acres on the north side of North Red Hill has an area for recreational vehicle and tent camping, a boat ramp, wastewater storage pond, and ranger station owned and maintained by the County of Imperial named Red Hill Marina Park. The hills have dirt and gravel roads, trails, and parking areas that overlook the Salton Sea, the northern Imperial Valley, and the known geothermal resources area. A public view of the Red Hills would not be eliminated or obstructed by the project.

Rock Hill (elevation -138 feet) is within the Sonny Bono Salton Sea National Wildlife Refuge (NWR). The hill is a little less than three miles to the west of the project. Rock Hill has a two-mile round trip walking trail overlook (Rock Hill Trail) that offers views of the Salton Sea, the vast array of birds that make the area home during migration, the northern Imperial Valley, and the known geothermal resource area. A public view of Rock Hill would not be eliminated or obstructed by the project.

Obsidian Butte (elevation -130 feet) is about three and three-quarters miles west southwest of the project site. It has been extensively quarried to the point that it has lost most of what would have been its original appearance, and it is littered with obsidian and other volcanic rock piles. The butte has dirt and gravel roads, trails, and parking areas that have views of the Salton Sea and the KGRA. A public view of Obsidian Butte would not be eliminated or obstructed by the project.

Mullet Island (elevation -190 feet), two and a quarter mile north of the project site is a broad flat sand bar that has fumaroles (a vent in the surface of the Earth), an "onionskin"

14 Mean Sea Level (MSL) often referred to as sea level is the height of the sea surface averaged over all stages of the tide over a long period of time. An elevation below the MSL is shown with a minus sign.

foliation and/or an enormous cumulation of bird droppings, and a deteriorated foundation for what maybe was a structure. Depending on the water level, it is sometimes the only island in the Salton Sea. A public view of Mullet Island would not be eliminated or obstructed by the project.

A segment of the Alamo River flows less than a half-mile east of the project site. The Imperial Valley segment of the river was originally constructed as a controlled, gravity-fed irrigation system in 1900. In most places the river is a vegetation-choked water channel. According to stream gauge monitors near the Salton Sea, the river water primary constituents are agricultural runoff and stormwater. A public view of this segment of the Alamo River would not be eliminated or obstructed by the project.

The construction and operation of the project would have a less than significant effect on the environment to a scenic resource.

Visual Character or Quality of Public View of Site and its Surroundings

c. Would the project "[i]n non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?"

Public Resources Code section 21071 defines "urbanized area."[15] Following Public Resources Code section 21071, the proposed project was determined to be in a non-urbanized area.

Staff examined aerial and street view imagery, GIS data, site and vicinity photographs, the photograph at the key observation point, the photo-realistic simulation(s) of the project in the existing landscape, elevations, and site development plans. Staff also reviewed federal, state, and local government codes and regulations, maps and plans, tour book guides and road atlases to determine the CEQA Guidelines level of effect on the environment by the project.

An adverse effect exists if the project in a non-urbanized area significantly degrades the existing visual character or quality of public views of the site and its surroundings, or if

15 An "urbanized area" means either "(a) An incorporated city that meets either of the following criteria: (1) Has a population of at least 100,000 persons. (2) Has a population of less than 100,000 persons if the population of that city and not more than two contiguous incorporated cities combined equals at least 100,000 persons." (Public Resources Code section 21071[a]) An urbanized area also includes unincorporated area that satisfies the criteria in Public Resources Code section 21071(b).

in an urbanized area conflicts with zoning and other regulations governing scenic quality.[16]

Key Observation Point Evaluation

"Because it is difficult to describe visual appearance in words, visual assessments of the existing environment and the consequences of project alternatives should be based on 'illustrations of actual views'.... Because resources and time are always limited, it is also necessary to limit the number of views analyzed: it is essential that these be 'representative views,' neither understating nor overstating the visual effects of the project." (Smardon 1986, p. 255)

In this analysis a *key observation point,* or KOP is used. A KOP is a fixed position in a publicly accessible location where a public view of the project is analyzed and evaluated in the landscape. An object of aesthetic significance is the primary focus.

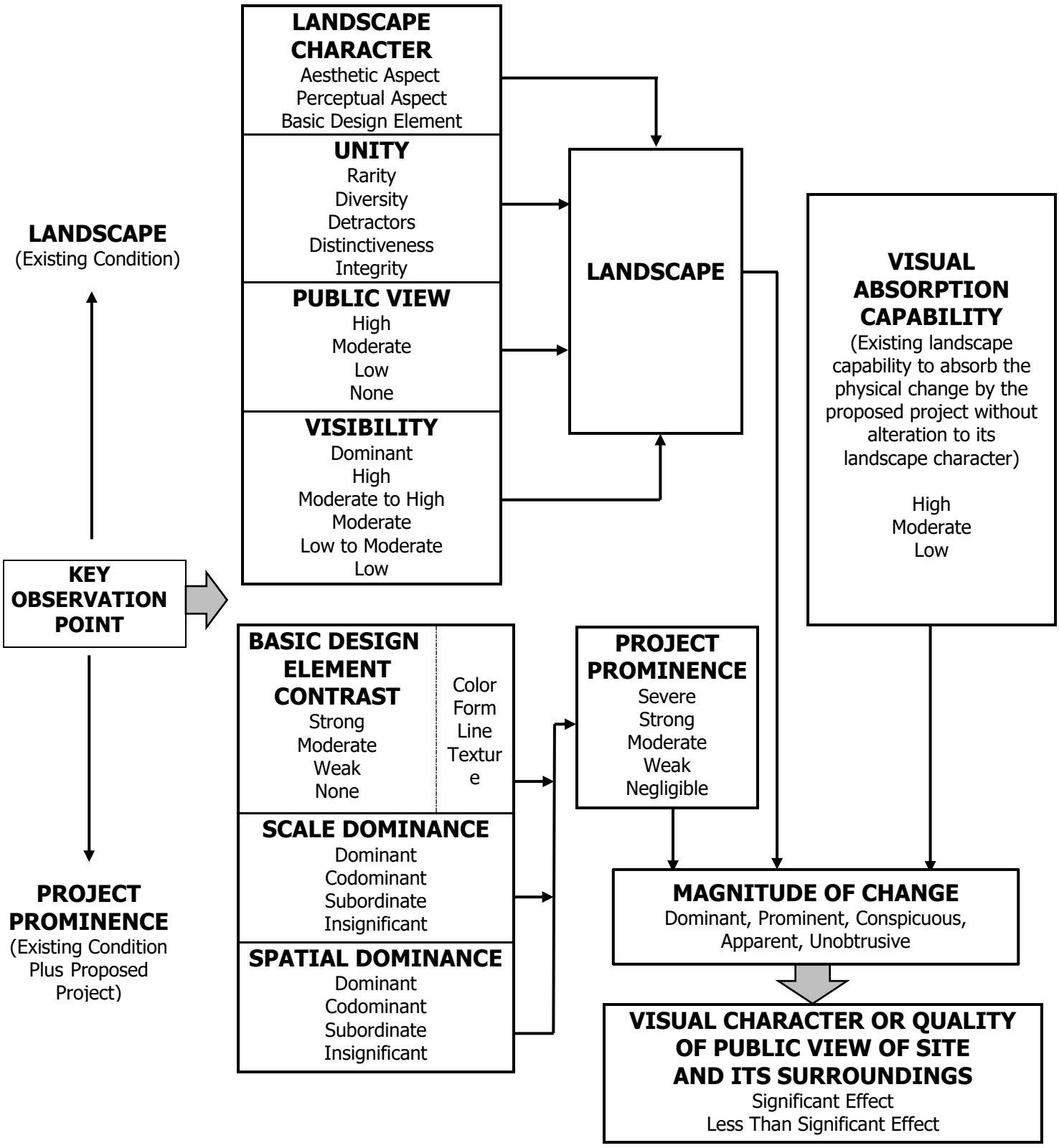
The potential physical change by the proposed project to an existing object of aesthetic significance in the area and the existing physical environment (landscape) are analyzed. See the Evaluation Flowchart below.

The applicant provided three photographs showing the view from the KOP[17] of the existing landscape including the project site (existing condition), and three photo-realistic simulations of the proposed project in the existing landscape from each KOP (existing condition plus proposed project), see **Figure 5.15-1** through **Figure 5.15-7**.

Staff completed a Key Observation Point Evaluation Worksheet (worksheet) for each KOP. The completed worksheets are in the **Appendices** at the end of this Staff Assessment in **Appendix B**. A synopsis of each worksheet is below.

16 Pub. Res. Code § 25525 requires a project to be in conformance with applicable federal, state, and local government laws, ordinances, regulations, and standards (LORS).
17 The applicant consulted with staff in the selection of KOPs.

Evaluation Flowchart



Construction and Operation

Less Than Significant Impact. Staff concludes given the existing landscape from the three KOPs, the project would not substantially degrade the existing visual character or quality of public views of the site and its surroundings.

KOP 1 – Rock Hill Summit

The KOP is from a public walking trail overlook at the summit of Rock Hill. Rock Hill and the walking trail (Rock Hill Trail) are in the NWR. The project site is approximately two and half miles to the east northeast. See **Figure 5.15-2** - Existing Condition from Rock Hill Summit, and **Figure 5.15-3** - Existing Condition Plus Proposed Project from Rock Hill Summit.

The NWR provides passive outdoor recreation opportunities to thousands of visitors every year. "Since its establishment, the refuge has had a fluid relationship with the shoreline and is not completely landlocked due to the shrinking of the sea. Though visitors can still take in sweeping views of the Sea and shoreline from our Rockhill trail which ends on top of our 'active' volcano." (USFW 2024) "Until 2021, the refuge had the distinction of having the most diverse bird species of any national wildlife refuge in the West with over 400 different species recorded and continues to be a birding hotspot for rare vagrant species." (USFW 2024)

Staff determined from the KOP given the existing landscape (existing physical environment), the *project prominence* (basic design element contrast, scale dominance, spatial dominance) in the landscape rated moderate. The *visual absorption capability* of the landscape rated low. The *magnitude of change* (dominant, prominent, conspicuous, apparent, unobtrusive) in the landscape rated conspicuous, meaning the project is clearly visible and noticeable in the view in the landscape.

For the purpose of the CEQA Guidelines, and as set forth in Table 15 of Appendix B, this combination of ratings yields a conclusion that the project would have a *less than significant effect on the environment* in the degrading of the existing visual character or quality of the public view of the site and its surroundings. See the KOP 1 worksheet in **Appendix B**.

KOP 2 – Red Hill Marina Park

The KOP is from a dirt and gravel road in the eastern part of Red Hill Marina Park. The project site is approximately one and three quarters miles east. See **Figure 5.15-4** Existing Condition from Red Hill Marina Park, and **Figure 5.15-5** Existing Condition Plus Proposed Project from Red Hill Marina Park.

The Red Hills are a dormant volcano that contains two lava domes, Prospect Dome and Alamo Dome (elevation -125 to -135 feet). The Red Hills have a sizable portion that has been quarried. On the northside of North Red Hill is Red Hill Marina Park a 10-acre

recreation vehicle and tent camping park owned and maintained by the County of Imperial.

From the KOP given the existing landscape, the project prominence in the landscape rated negligible. The visual absorption capability of the landscape rated high. The magnitude of change in the landscape rated apparent, meaning the project would be visible or evident in the view in the landscape.

For the purpose of the CEQA Guidelines, and as set forth in Table 15 of Appendix B, this combination of ratings yields a conclusion that the project would have a *less than significant effect on the environment* in the degrading of the existing visual character or quality of the public view of the site and its surroundings. See the KOP 2 worksheet in **Appendix B**.

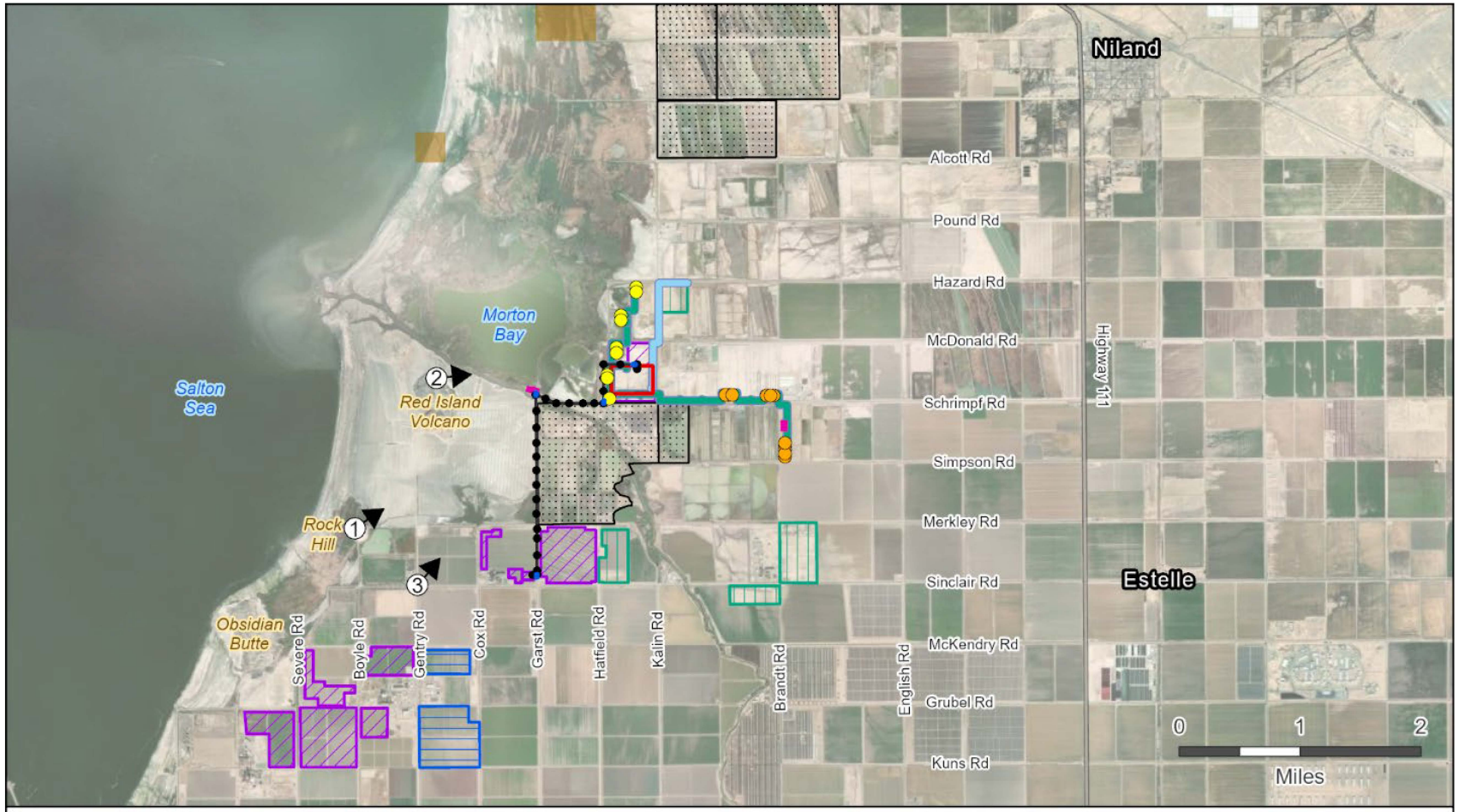
KOP 3 – Sonny Bono Salton Sea National Wildlife Refuge Entrance

The KOP is from West Sinclair Road, a county improved public road east of the main entrance to the NWR. The project site is a little less than three miles to the northeast. See **Figure 5.15-6** Existing Condition from Sonny Bono Salton Sea National Wildlife Refuge Entrance, and **Figure 5.15-7** Existing Condition Plus Proposed Project from Sonny Bono Salton Sea National Wildlife Refuge Entrance.

The NWR headquarters, visitor center, gift shop, and an observation tower are located at 906 West Sinclair Road. It is here visitors access the Rock Hill Trail, a two-mile out-and-back trail where the Salton Sea, habitats, and birds can be viewed. Volunteers are available to provide visitors with maps, brochures, and information as to what is happening on the refuge during the viewing season.

From the KOP given the existing landscape, the project prominence in the landscape rated weak. The visual absorption capability of the landscape rated moderate. The magnitude of change in the landscape rated unobtrusive, meaning the project would be indistinct or not obvious in the view in the landscape.

For the purpose of the CEQA Guidelines, and as set forth in Table 15 of Appendix B, this combination of ratings yields a conclusion that the project would have a *less than significant effect on the environment* in the degrading of the existing visual character or quality of the public view of the site and its surroundings. See the KOP 3 worksheet in **Appendix B**.


Niland
Alcott Rd
Pound Rd
Hazard Rd
McDonald Rd
Schrimpf Rd
Simpson Rd
Merkley Rd
Sinclair Rd
McKendry Rd
Grubel Rd
Kuns Rd
Highway 111
Estelle
Morton Bay
Salton Sea
Red Island Volcano
Rock Hill
Obsidian Butte
Severe Rd
Boyle Rd
Gentry Rd
Cox Rd
Garst Rd
Hatfield Rd
Kalin Rd
Brandt Rd
English Rd
1
2
3
0
1
2
Miles
Key Observation Point (KOP)
Injection Well
Production Well
Gen-Tie Line Pole
Gen-Tie Line
Pipelines
Water Supply Pipeline
Plant
Well Pad
Pull Site
Switching Station
Borrow Pit
Construction Camp
Construction Laydown and Parking Areas
BLM Land
Imperial Wildlife Area
Sonny Bono Salton Sea National Wildlife Refuge
Visual Resources Figure 5.15-1
Key Observation Point (KOP) Locations
Morton Bay Geothermal Project
Source: Jacobs 2023a

Visual Resources Figure 5.15-2
KOP 1 - Existing Condition from Rock Hill Summit
Morton Bay Geothermal Project

Source: Jacobs 2023a

Visual Resources Figure 5.15-3
KOP 1 - Existing Condition Plus Proposed Project from Rock Hill Summit
Morton Bay Geothermal Project

Source: Jacobs 2023kk

Visual Resources Figure 5.15-4
KOP 2 - Existing Condition from Red Hill Marina Park
Morton Bay Geothermal Project

Source: Jacobs 2023a

Visual Resources Figure 5.15-5
KOP 2 - Existing Condition Plus Proposed Project from Red Hill Marina Park
Morton Bay Geothermal Project

Source: Jacobs 2023kk

Visual Resources Figure 5.15-6
KOP 3 - Existing Condition from Sonny Bono Salton Sea National Wildlife Refuge Entrance
Morton Bay Geothermal Project

Source: Jacobs 2023a

Visual Resources Figure 5.15-7
KOP 3 - Existing Condition Plus Proposed Project from Sonny Bono Salton Sea National Wildlife Refuge Entrance
Morton Bay Geothermal Project

Source: Jacobs 2023kk

New Buildings/Structures and Site Development

A few purposes for a height requirement include to preserve a scenic vista, protect the public view of a scenic resource (e.g., an architectural structure, a landmark, natural feature), and to maintain the existing land use character of the surrounding area (e.g., agricultural, historical, residential).

The staff review of the county general plan and zoning, aerial and street imagery, area maps, site and vicinity photographs; and project elevations, drawings, photo-realistic simulations concluded the project proposed buildings and structures are not within a scenic vista, would not eliminate or obstruct the public view of a scenic resource, and would be concordant with observable land uses and other buildings and structures in the surrounding area.

Publicly Visible Water Vapor Plumes

A publicly visible water vapor plume (visible plume) emitted in the atmosphere from a proposed cooling tower is analyzed to determine if the visible plume: 1) would have a substantial adverse effect on a scenic vista, 2) would substantially damage scenic resources; and, 3) would substantially degrade the existing visual character or quality of public views of the site and its surroundings in a non-urbanized area, or conflict with applicable zoning and other regulations governing scenic quality in an urbanized area. Also, would plume formation result in fogging or icing offsite.

A visible plume is a reference to the visibility and path of the effluent air stream after having exited the cooling tower that is visible and elevated.

The project site is in an active geothermal resource area, attributed to its location in the Salton Trough at the southern end of the San Andreas fault system between two tectonic plates. The United States Department of the Interior Bureau of Land Management and the United States Geological Survey have designated the area the "Salton Sea Known Geothermal Resource Area." Currently, 11 geothermal power plants operate in it.

In the basic operation for a geothermal power plant, the Earth subterranean heat replaces the use of a boiler fueled by coal, fission, or natural gas to raise superheated steam that spins a steam turbine to generate electricity. A cooling tower[18] is an integrated part of any geothermal power plant because waste heat from turbine exhaust steam must be continuously rejected to make the power plant operate.[19]

18 "A cooling tower is a heat rejection device which extracts waste heat to the atmosphere through the cooling of a water stream to a lower temperature. The type of heat rejection inside a cooling tower is termed 'evaporative' in that it allows a small portion of the water being cooled to evaporate into a moving air stream to provide significant cooling to the rest of that water stream." (CTI 2012)

19 "Flash steam plants take high-pressure hot water from deep inside the earth and convert it to steam that drives generator turbines. When the steam cools, it condenses to water and is injected back into the ground to be used again. Most geothermal power plants are flash steam plants." (EIA 2022)

The AFC states heat rejection for the steam turbines would be accomplished with a mechanical draft counterflow wet cooling tower. (Jacobs 2023a, p. 2-2) The application also states that geothermal steam flashing activities may include the direct release of geothermal steam to the atmosphere through the PTU [production testing unit] or the RM [rock muffler]. Each of these operations would include the release of hot steam from defined structures and areas within the project site. (Jacobs 2023a, p. 5-1-40)

The applicant's response in their Data Response Set 1 when asked by the staff what would be "the approximate height of the steam that vents into the air, how often this event occurs, and how long the venting occurs," was "The AFT [atmosphere flash tank] is 95 feet above grade. The AFT will operate continuously anytime electricity is being generated or geothermal fluid is flowing at the facility." (Jacobs 2023u, p. 3-5) Staff concludes for the MBGP that an attached visible plume exiting the AFT in the atmosphere would also be 95 feet in length.

"Based on previous experience with the kinds of systems that would be installed on the Project, visible plumes would be common occurrence consistent with the visible plumes from the other geothermal powerplants in the area." (Jacobs 2023a, p. 5-13-23)

The staff review of past and present photographs of the surrounding area and street view imagery show visible plumes emitted from the geothermal power plants in this known geothermal resource area for many decades. Visible plumes are a common sight in the landscape and sky.

Staff analyzed new visible plume(s) emitted by the project based on the "Aesthetics" questions supplied on the Appendix G Environmental Checklist Form, definitions and explanations in this section and the evaluation worksheet tables in Appendix B

Visible Plume – Existing Visual Character or Quality of Public Views. Would the forecasted visible plume(s) emitted from the project substantially degrade the existing visual character or quality of public views of the site and its surroundings?

From KOP 1 the scale dominance of the visible plume rated insignificant. The visible plume would be a small object occupying an exceedingly small area in the landscape. The spatial dominance of the visible plume rated codominant in the setting or the landscape situation backdrop. The visibility of the visible plume rated moderate, meaning the plume would be visible after brief glance in general direction of the project and unlikely to be missed by a casual observer.

From KOP 2 the scale dominance of the visible plume rated insignificant. The visible plume would be a small object occupying an exceedingly small area in the landscape. The spatial dominance of the visible plume rated codominant in the setting or the landscape situation backdrop. The visibility of the visible plume rated low to moderate. The plume would be visible when scanning in general direction of the project; otherwise, likely to be missed by a casual observer.

From KOP 3 the scale dominance of the visible plume rated insignificant. The visible plume would be a small object occupying an exceedingly small area in the landscape. The spatial dominance of the visible plume rated codominant in the setting or the landscape situation backdrop. The visibility of the visible plume rated low to moderate. The plume would be visible when scanning in the general direction of the project; otherwise, likely to be missed by a casual observer.

For the purpose of the CEQA Guidelines, and as set forth in Table 15 of Appendix B, this combination of ratings yields a conclusion that from KOP 1, KOP 2, and KOP 3 forecasted visible plumes emitted in the atmosphere from the project would have a *less than significant effect on the environment* in the degrading of the existing visual character or quality of the public view of the site and its surroundings.

Visible Plume - Scenic Resources. Would the forecasted emitted visible plume(s) from the project substantially damage scenic resources?

The staff reviewed the Imperial County General Plan Land Use Element, county ordinances, aerial and street view imagery, area maps, etc. and concluded that the visible plumes would not substantially damage the public view of a scenic resource on the site or in the vicinity.

From KOP 1, KOP 2, and KOP 3 forecasted visible plumes emitted in the atmosphere from the project would not eliminate or obstruct the public view of a scenic resource in the vicinity. The forecasted visible plumes would have a *less than significant effect on the environment* to a scenic resource.

Visible Plume - Scenic Vista. Would the forecasted emitted visible plume(s) from the project have a substantial adverse effect on a scenic vista?

The Imperial County General Plan Land Use Element and the Conservation and Open Space Element do not show a scenic vista or have an applicable general plan policy pertaining to a scenic vista in the surrounding area of the project. Staff did not find a county ordinance designating a scenic vista that includes the project site.

The staff review of aerial and street view imagery and area maps concluded the visible plumes would be located on an unenclosed plain, the northern Imperial Valley floor, and not within a scenic vista as defined by the CEC.

From KOP 1, KOP 2, and KOP 3 forecasted visible plumes emitted in the atmosphere from the project would have a *less than significant effect on the environment* to a scenic vista.

Fogging and Icing Offsite

Fogging is a reference to the visibility and path of the effluent air stream after having exited the cooling tower that is visible and close to the ground.

If ambient temperatures are warm and normal atmospheric stability exists, vapor plumes may condense at the cooling tower stack and quickly evaporate in the atmosphere. However, problems can occur when the ambient temperature drops below 50-60 degrees Fahrenheit, and the relative humidity exceeds 80 percent. Under these conditions, air is carrying close to its saturation load of water vapor and the added vapor from a plume may be sufficient to produce a supersaturated region near the cooling tower stack. Water droplets then form to produce fog. Under certain atmospheric conditions and local topography, a condensing vapor plume may descend to ground level obstructing visibility on highways and roads. If the ambient temperature is low, below 32 degrees, icing of overhead power lines, roadways, and sidewalks may occur.

The staff reviewed climate and weather-related information for the region from Weatherspark.com. Weatherspark.com presents information based on modeling using climate and weather-related data inputs spanning the 36 years between 1982 to 2018. See **Appendix C** in the **Appendices** for an adapted overview prepared by staff of the information from Weatherspark.com.

The project is in a desert environment in the northern part of Imperial Valley. The climate is characterized by hot summers and mild winters. The community of Niland over the course of a year has a temperature that typically ranges between 42 degrees and 107 degrees Fahrenheit. The hottest month is July with an average high of 107 degrees and low of 80 degrees. The coldest month December has an average low of 43 degrees and high of 69 degrees. August is the month with the greatest number of days with the highest humidity at 10.3 days. August is the month with the single highest humid day at 35 percent on August 12th.

Staff has concluded plume formation emitted from the project resulting in fogging and icing offsite would be rare and have a *less than significant effect on the environment* in the degrading of the existing visual character or quality of the public view of the site and its surroundings.

Large Diesel Generator Operation (Backup Generation)

The project would have three diesel generators to provide backup generation in case of an interruption to the electricity supply at the facility, and one diesel generator for fire water pump operation. Manufacturer performance data provided by the applicant shows generator exhaust stack flow gas temperatures at a 100 percent load standby are 914 degrees and 961 degrees Fahrenheit. These extremely hot temperatures (greater than 212 degrees Fahrenheit heating stream) eliminate (evaporate) the necessary saturated rising moisture exiting the generator exhaust stack that could condense in the atmosphere forming a visible plume. There is little to no water content in the generator exhaust stack flow. It is a dry air mass flow. There would be *no effect on the environment.*

Light and Glare

d. Would the project "[c]reate a new source of substantial light or glare which would adversely affect day or nighttime views in the area?"

Light, glare, and reflectance emitted from a project are analyzed to determine if each would create an adverse effect to the existing physical environment offsite and skyward (light pollution, reflectance).

Light Pollution

"Light pollution is the human-made alteration of outdoor light levels from those occurring naturally." (DarkSky 2024) Light pollution "occurs when outdoor lighting is misdirected, misplaced, unshielded, excessive or unnecessary. As a result, light spills unnecessarily upward and outward, causing glare, light trespass, and a nighttime urban 'sky glow' overhead, indicating wasted energy and obscuring the stars overhead," and clutter.[20] (Dark Sky Society 2024)

DarkSky International (formerly the International Dark-Sky Association) is a recognized worldwide authority combating light pollution. DarkSky International recognizes to minimize the harmful effects of light pollution, lighting should: only be on when needed; only light the area that needs it; be no brighter than necessary; minimize blue light emissions;[21] and be fully shielded.[22]

The DarkSky International "DarkSky Approved" program offers luminaires that significantly reduce light pollution and nocturnal habitat disruption. The DarkSky Approve program provides an objective, third-party certification for lighting related products that minimize glare, reduce light trespass, and do not pollute the night sky.[23] These outdoor luminaires include among other design features and functions, shielding, no uplight allowance (BUG Rating U0[24]), luminaires that have dimming capability to one percent of full rating and no more than seven percent of visible emissions in 380-520 nanometers.[25]

20 Clutter is the bright, confusing, and excessive grouping of light sources.
21 Studies show exposure to blue light can cause eye strain, fatigue, headaches, and sleeplessness.
22 "Fully shielded**"** means a luminaire constructed in a manner that all light emitted from the fixture, either directly from the lamp or a defusing element, or indirectly by reflection or refraction from any part of the luminaire is projected below the horizontal plane, as determined by a photometric test or certified by the manufacturer.
23 To see a list of DarkSky Approved products, manufacturers, and retailers visit the DarkSky International website <www.darksky.org>.
24 "A BUG Rating stands for backlight, uplight, and glare. Backlight (B) is the light directed behind the fixture, uplight (U) is any light directed upward above the horizontal plane of the luminaire, and glare (G) is the amount of light emitted from the luminaire at high angles. The backlight, uplight, and glare ratings are assigned a value between 0 and 5 (with lower on the scale being more desirable) depending on the maximum amount of light in these zones based on thresholds defined by the Illuminating Engineering Society (IES) and enforced by the International Dark-Sky Association (IDA)" [now named DarkSky International]. (FirstLight 2024) The BUG rating is typically included in the product specifications.
25 The human eye can view the segment of the electromagnetic radiation spectrum wavelengths between 380 to 700 nanometers. This segment is known as "visible light."

Artificial Light and Nocturnal Creatures

"Scientific evidence suggests that artificial light at night has negative and deadly effects on many creatures, including amphibians, birds, mammals, insects, and plants. … Predators use light to hunt, and prey species use darkness as cover."[26]

"Keeping the light **LOW** (mounting the fixture as low as possible) and **SHIELDED** (fully shielding the light so bulbs and/or glowing lenses are not visible) cuts down on the amount of glare and light visible to the animals, so that there is less opportunity for them to get trapped, repelled, or have their day/night patterns altered. Keeping it **LONG** wavelength (ambers and reds) actually makes the light that is visible seem dimmer to nocturnal animals that primarily use rod vision. The rod system's peak sensitivity is at 496 nm [nanometers], so a low-pressure sodium light, with its emitted light at 589 nm, should seem 1/10th as bright to an animal using purely rod vision vs. an animal that uses rods and cones to see." (FFWCC 2024)

"Some Institutes and even cities have adopted a "Lights Out" program in which exterior lighting as well as interior lights in tall buildings are dimmed or turned off during periods of bird migration. Bare bulbs or upward pointing lights are replaced with hooded fixtures that only shine downward. If lights can't be turned off, then use flat lens, and reduce the number of lights and intensity. Both the height of the pole and the intensity of the lamp should be adjusted to only direct light where needed. ..." (NIEHS 2015)

Safety and Security Lighting

"Each organization should ensure a minimum level of light for their respective property areas that complies with all applicable regulations and industry guidelines. Security lighting requirements should be specified by a lighting engineer. Ideally, lighting requirements will be identified as part of a security survey. The lighting program should take account the following:

- Lighting should not illuminate security/protection officers or patrols. Where security patrols cannot be kept out of the zones of illumination, a judgment must be made between the advantages of the lighting and the reduction in patrol effectiveness.
- Lighting must be combined with surveillance. The deterrent effect of lighting depends on the fear of detection. This may also require video surveillance or security/protection officers on static posts and mobile patrols.
- Lighting must not cause nuisances or hazards to neighbors, such as light pollution or light trespass. Lighting may adversely affect adjoining or adjacent properties such as residential properties, roadways, airports, harbors, neighboring commercial buildings, or properties.
- Lighting must be cost-effective and compatible with site conditions. It may not be economical to illuminate very large areas. Take into account both the existing lighting

26 DarkSky International maintains the Artificial Light at Night (ALAN) Database. It provides the latest scientific literature on how light pollution affects wildlife. (DarkSky 2024)

outside the perimeter and the lighting installed within the site for operational or safety purposes." (Fenelly and Perry 2017)

Reflectance

Reflectance is the proportion of perpendicular incident light reflected from the surface or body of a material. All surfaces reflect light. Light reflects off the surface in a very predictable manner. "Reflectivity is defined as the property of a material to reflect the light or radiation. It is a measurement of reflectance irrespective of the thickness of a material." (Electrical4U 2020)

Potential reflectance from various viewpoints, the angle and orientation of the exterior surface of project components towards the sun, surrounding buildings, and public places need to be examined.

Exterior surface coatings and materials that diffuse illumination or collection, reflectance and scattering are of utmost importance. "An ideal coating is non-specular (to decrease geometrical effects) durable, high in reflectance and spectrally flat over a wide wavelength range to give a flat spectral response in input or output." (Labsphere, Inc. 2020) Materials with a non-shiny, textured or matt/powder finish are preferable to glossy or shiny finishes. A few examples of materials and surface treatments that should be avoided if possible: any material with a reflectance greater than 35 percent; any shiny, highly reflective materials even for small surfaces; large smooth surfaces; and large expanses of glass.

The Master Painters Institute (MPI) provides guidelines and standards for the architectural paint and coatings sector in the United States and Canada. "In order to provide Coatings Specifiers with a common language to describe Paint Finishes, MPI includes GLOSS and SHEEN measurements as part of the criteria for many of its MPI category specifications. MPI specifies seven GLOSS levels, each of which are described below, along with their GLOSS measurement range (as seen at an 85º viewing angle) and SHEEN measurement range (as seen at a 60º viewing angle[27])." (Rodda Paint Company 2024) The seven GLOSS levels include the following:

Gloss Level 1 – Flat (traditional matte finish)

Gloss Level 2 – Satin/Pearl (high side sheen Flat, "Velvet-like" finish)

Gloss Level 3 – Eggshell (traditional "Eggshell-like" finish)

Gloss Level 4 – Low Gloss ("Satin-like" finish)

Gloss Level 5 – Semi Gloss (traditional Semi-Gloss)

27 "A 60º viewing angle looking at a PAINT FINISH – The most common viewing angle used by the Coatings industry to describe the various levels, from Flat to High Gloss. The GLOSS of a surface is described by a number based on the reflection of light from the surface that is independent of color. The higher the number, the 'Glossier' the Paint Finish." (Rodda Paint Company 2024) For more information on the MPI guidelines and standards visit the Master Painter Institute website <https://mpi.net/>, also visit the Rodda Paint Company website <https://www.roddapaint.com/how-to/selecting-gloss-level/>.

Gloss Level 6 – Gloss (traditional Gloss)

Gloss Level 7 – High Gloss (High Gloss)

Construction and Operation

Less Than Significant Impact. The project would have outdoor luminaires to illuminate driveways, entrances, walkways; operation, parking and loading areas; and for safety and security. The exterior surfaces of the buildings, equipment, and structures reflect light. All surfaces reflect light.

The AFC did not include a conceptual light pollution control plan for the proposed project, or a list of luminaires and/or their vendor brochures.

Light Pollution Amelioration

The AFC states "Lighting on the Project site will be limited to areas required for safety, will be directed on site to avoid backscatter, and will be shielded from public view to the greatest extent practical. All lighting that is not required to be on during nighttime hours will be controlled with sensors or switches operated such that the lighting will be on only when needed." (Jacobs 2023a, p. 2-34)

"Nighttime construction is not anticipated unless certain short-term construction procedures are required that cannot be interrupted because of safety or other logistical considerations. If circumstances require nighttime construction activity, any necessary temporary lighting would be focused and directed on work areas and away from surrounding properties.

Operational lighting on the Project site would be limited to areas required for safety, would be directed on site to avoid backscatter, and would be shielded from public view to the extent practical. All lighting that is not required to be on during nighttime hours would be controlled with sensors or switches operated such that the lighting would be on only when needed." (Jacobs 2023a, p. 5.13-20)

The AFC also states "Bright night lighting could disturb wildlife using areas adjacent to the MBGP (such as nesting birds, foraging mammals, and flying insects). Night lighting also is suspected to attract migratory birds to areas and, if the lights are on tall structures, collisions could occur. Additionally, certain lighting may attract insects, which in turn may attract birds, such as the short-eared owl, and bats to forage. The MBGP lighting will meet the requirements for security and safety and will be shielded and pointed downward and away from the habitat outside of the Project area to minimize impacts to nesting birds and other nearby wildlife, and to reduce the potential for avian and bat attraction and collision." (Jacobs 2023a, p. 5.2-26)

Reflectance Amelioration

AFC Table 5.13-2. Structural Dimensions, Materials, and Aesthetic Treatment names colors, materials, and gloss level for individual project components. The majority of the components would have a Beige (RAL 1001) or similar color, a semi-gloss and involves

carbon steel, concrete, fiberglass, and stainless-steel materials. (Jacobs 2023a, p. 5.13.21-23)

The AFC states, "… structure surfaces would be treated with non-reflective coatings, where feasible …" (Jacobs 2023a, p. 5.13-27)

The application also says "TSP [tubular steel pole] structures would be constructed from steel and coated with corrosion and glare resistant material. The structures would be a dull gray color." (Jacobs 2023a, p. 5.13-20)

Conclusion

The AFC contains statements demonstrating the intent to implement shielding, directional light, non-reflectance materials, and other light pollution and reflectance facility design measures.

Shielding is a key element in night-sky-friendly lighting. Fully shielded fixtures, also known as "full-cutoff" fixtures are the gold standard. No light escapes upward or outward and a passerby is not blinded by the glare from an exposed bulb.

The applicant supplied photo-realistic simulations of the project from the KOPs that show the project in a Beige color in the landscape.

The applicant in their AFC on page 5.13-28 (Section 5.13.5 Mitigation Measures) has proposed the following two mitigation measures pertaining to light and reflectance for consideration by the CEC.

> "VIS-1: The applicant shall coordinate with the California Energy Commission and/or Imperial County on the utilization of appropriate glare-minimizing surface treatment and materials on exterior equipment surfaces, as feasible, prior to final design. Surface treatment of exterior equipment shall comply with Imperial County Municipal Code Section 91702.02(E), as feasible.
>
> VIS-2: The applicant shall coordinate with the California Energy Commission and/or Imperial County on appropriate night lighting design and materials prior to final design. Lighting shall comply with Imperial County Municipal Code Section 91702.02(L), as feasible." (Jacobs 2023a, p. 5.13-28)

Staff concludes the level of light, glare, and reflectance emitted from the project in the landscape as described and explained in this analysis, and with the effective implementation of the applicant provided mitigation measures, as revised by staff, shown under subsection 5.15.5 Proposed Conditions of Certification (see **VIS-1** and **VIS-2**) would have a *less than significant effect on the environment* in the area.

5.15.2.3 Cumulative Impacts

As described, explained, and evaluated in this section, the incremental effect by the project would not result in a substantial adverse effect on a scenic vista, substantially

damage a scenic resource, nor substantially degrade the existing visual character or quality of public views of the site and their surroundings, and would not create a new source of substantial light, glare, and reflectance adversely affecting day or nighttime views in the area. Staff concludes for "Aesthetics" the proposed project would have an incremental effect that would not be cumulatively considerable and would have a *less than significant effect on the environment*.

5.15.3 Project Conformance with Applicable LORS

Warren-Alquist Act, Chapter 6. Power Facility and Site Certification directs the California Energy Commission to evaluate if a proposed project conforms with federal, state, and local government laws, ordinances, regulations, and standards (LORS).

In accordance with Public Resources Code section 25525, the staff reviewed the project for conformance with applicable LORS relating to aesthetics and visual resources: scenic quality, scenic resources, scenic vista, lighting, glare, architectural design and site development, exterior surface coatings, colors, finishes, and materials, landscaping, and signage. Applicable LORS reviewed are shown in **Table 5.15-1** below.

Table 5.15-1 provides staff's determination of conformance with applicable LORS, including any proposed condition of certification (COC), where applicable, to ensure the project would comply with LORS.

Staff concludes that with implementation of the proposed COCs, the project would be in conformance with applicable LORS. Subsection 5.15.5 Proposed Conditions of Certification contains the full text of the referenced COCs.

TABLE 5.15-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
State	
California Scenic Highway Program. Section 263 of the Streets and Highways Code, the "State Scenic Highway System List" provides a list of highways that have been either officially designated or are eligible for designation as a State scenic highway.	**Yes.** The "State Scenic Highway System List" shows the project site is not along a designated State scenic highway.
Local	
Imperial County General Plan	
Conservation and Open Space Element. 1. Scenic Visual Resources. "The County's visual character varies greatly. It includes natural scenic visual resources such as deserts, sand dunes, mountains, and the Salton Sea. Many of the natural scenic resources are located on land under Bureau of Land Management (BLM) jurisdiction. County areas for BLM-managed lands are shown on Figure 9 and depict the values of the County's visual resources based on their Visual Resource Inventory (VRI) process. Areas with a moderate to high value for	**Yes.** The project site is not land managed by the U.S. Bureau of Land Management (BLM) as shown on Figure 9 Imperial County VRI (Visual Resources Inventory) Sensitivity Level Ratings for BLM-Managed Lands. The Imperial County Zoning Map 54 – Red Hill Area shows the project site zoning S-1-G (Open Space/Recreational Zone-Geothermal Overlay). Imperial County Renewable Energy Overlay Map, adopted November 24, 1998, amended December 16, 2003, revised October 24, 2017, shows the

TABLE 5.15-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
maintenance of visual quality could represent opportunities for conservation and open space areas. Although these areas are within BLM lands, private inholdings under the County's jurisdiction may be available for conservation or open space designations. The County also includes agricultural areas and built environments such as urban areas and solar, wind, and geothermal energy development." (Imperial County General Plan, Conservation and Open Space Element, adopted March 8, 2016, pp. 27-28)	project site in an area designated Renewable Energy/Geothermal. (Imperial County 2023, Division 17, section 91701.02)
Renewable Energy and Transmission Element. E. Issues Relating to Renewal Energy Development and Transmission Corridors. Aesthetics. "Future projects would need to evaluate whether their location in relation to key observation areas would impact the existing aesthetics of the surrounding area. Much of the County is visible from major roadways, and potential impacts to existing visual resources from proposed alternative energy projects would need to be considered during siting, planning, and design. Although no highways in Imperial County are designated as state scenic highways, the routes considered eligible for designation are still recognized and would need to be taken into consideration for planning renewable energy projects. Recreational areas with scenic qualities such as the Salton Sea and Picacho State Recreation Area would need to be considered when siting potential renewable energy projects. Furthermore, future projects would also need to **be evaluated for compatibility with current visual resource ratings assigned to BLM-managed lands." (Imperial County General Plan, Renewable Energy and Transmission Element, p. 17)**	**Yes.** The project is approximately 3¾ miles west of California Route 111. The project site is not land managed by the U.S. Bureau of Land Management (BLM) as shown on Figure 9 Imperial County VRI (Visual Resources Inventory) Sensitivity Level Ratings for BLM-Managed Lands. The Salton Sea is about two miles to the west of the project site. The sea is an endorheic lake since there is no natural outlet. These days, it is a catchment for run-off from farms in the Imperial Valley. The sea has been sustained by agricultural drainage from the Imperial, Coachella, and Mexicali valleys; rainfall; storm runoff from the surrounding mountains; and groundwater inflow. Water leaves the sea only by evaporation increasing harmful airborne dust during wind events. The shrinking volume of the Salton Sea leaves drier exposed playa and a saltier residual sea reducing habitat quality for aquatic birds and fish. For the time being, the area is an important wildlife habitat area. It provides migrating and wintering habitat for thousands of waterfowl and other birds. The Red Hills are about one and three-quarters mile west of the project site. The Red Hills (elevation -125 to -135 feet) have a sizable portion that has been quarried. Ten acres on the north side of North Red Hill is used as a recreational vehicle parking and tent campground, boat ramp, wastewater storage pond, and ranger station owned and maintained by the County. The hills have dirt and gravel roads, trails, and parking areas that lookout over the Salton Sea, the northern Imperial Valley, and the KGRA. Rock Hill (elevation -138 feet) is a little less than three miles to the southwest of the project. It is within the Sonny Bono Salton Sea National Wildlife Refuge. The hill has a two-mile round trip public

TABLE 5.15-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
	walking trail overlook (Rock Hill Trail) that offers views of the Salton Sea, the vast array of birds that make the area home during migration, the northern Imperial Valley, and the KGRA.
Imperial County Ordinances	
The Imperial County Zoning Map 54 – Red Hill Area shows the project site is zoned S-1-G (Open Space/Recreational Zone-Geothermal Overlay). Imperial County Ordinances, Title 9, Division 5, section 90518.07. The S-1 zoning designation maximum building or structure height is 35 feet, except for communication towers which are 100 feet.	**Yes.** The applicant's Revised General Arrangement Refinement includes building elevations that show several buildings and/or structures with a height higher than 35 feet. Approval of a variance to the zone height requirement is necessary to allow project buildings and structures. Refer to section **5.8 Land Use** for the variance discussion. A few purposes for a height requirement include to preserve a scenic vista, protect the public view of a scenic resource (e.g., an architectural structure, a landmark, natural feature), and to maintain the observable land use character of the surrounding area (e.g., agricultural, historical, residential). For the purpose of aesthetics/visual resources, the staff review of aerial and street imagery, area maps, site and vicinity photographs, the county general plan and ordinances show/indicate project buildings and structures are not within a scenic vista, would not block the public view of a scenic resource, and would maintain the observable land use character of the surrounding area.
Imperial County Ordinances, Title 9, Division 5, section 90518.10. The S-1 zoning designation permits specific types of signs in accordance with the requirements of section 90401 includes institutional signs, signs attached to buildings, and pole signs advertising onsite identification uses only.	**Yes.** The applicant's AFC and project description do not mention a sign(s). The project elevations, drawings, photo-realistic simulations do not show a sign(s).
Imperial County Ordinances, Title 9, Division 5, section 90518.11 LANDSCAPING. Every S-1 lot, parcel or use shall meet the requirements of Section 90302.06.	**Yes.** The requirement applies to landscaping for a single-unit residential development.
Imperial County Ordinance, Title 9, Division 17, section 91702.00. The following specific standards shall apply to all Renewable Energy Projects with additional or stricter site-specific standards as necessary: R. Lights should be directed or shielded to confine direct rays to the Project site and muted to the maximum extent consistent with safety and operational necessity.	**Yes.** The AFC states, "Operational lighting on the project site would be limited to areas required for safety, would be directed on site to avoid backscatter, and would be shielded from public view to the extent practical. All lighting that is not required to be on during nighttime hours would be controlled with sensors or switches operated such that the lighting would be on only when needed. Lighting would be provided in the following areas: ▪ Building interior, office, control, and maintenance areas

TABLE 5.15-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
	▪ Building exterior entrances ▪ Outdoor equipment platforms and walkways ▪ Transformer areas ▪ Power island perimeter roads ▪ Parking areas ▪ Plant entrance" (Jacobs 2023a, pp. 5.13-20-21) The onsite 230 kilovolt substation is not identified on the above list. Staff has proposed **VIS-2** so that the project would be in conformance with this County ordinance requirement with its implementation.
Imperial County Ordinances, Title 9, Division 17, section 91702.00. The following specific standards shall apply to all Renewable Energy Projects with additional or stricter site-specific standards as necessary: U. Shrubs, trees, and ground cover shall be planted and maintained to compliment the appearance of the Project where soil conditions permit as appropriate, and as approved by the Director of Planning and Development Services.	**Yes.** The AFC states that although no landscaping is proposed, the Project would be subject to Division 17 of the Imperial County Municipal Code (Section 91702.02(E)) which requires pipelines to be painted and/or landscaped to blend with the environment. **VIS-1** requires agency coordination for surface treatment of exterior equipment. (Jacobs 2023a, Table 5.13-4, p. 5.13-33) Staff has proposed COCs so the project would be in conformance with this County ordinance requirement with its implementation. See **VIS-1** and **VIS-3**.
Imperial County Ordinances, Title 9, Division 17, section 91703.01. The following specific standards shall apply to Geothermal Projects - Drilling Standards. J. Lights should be directed or shielded to confine direct rays to the Project site and muted to the maximum extent consistent with safety and operational necessity.	**Yes.** The AFC states "Operational lighting on the Project site would be limited to areas required for safety, would be directed on site to avoid backscatter, and would be shielded from public view to the extent practical. All lighting that is not required to be on during nighttime hours would be controlled with sensors or switches operated such that the lighting would be on only when needed." (Jacobs 2023a, p. 5.13-20) Staff has proposed a COC so the project would be in conformance with this County ordinance requirement with its implementation. See **VIS-2**.
Imperial County Ordinances, Title 9, Division 17, section 91703.02. The following specific standards shall apply to Geothermal Projects – Production Standards. D. Shrubs, trees, and ground cover shall be planted and maintained to compliment the appearance of the Project where soil conditions permit as appropriate, and as approved by the Director of Planning and Development Services.	**Conforms**. The AFC states "Although no landscaping is proposed, the Project would be subject to Division 17 of the Imperial County Municipal Code (Section 91702.02(E)) which requires pipelines to be painted and/or landscaped to blend with the environment. Mitigation Measure VIS-1 requires agency coordination for surface treatment of exterior equipment." (Jacobs 2023a, Table 5.13-4, p. 5.13-33) Staff has proposed a COC so the project would be in conformance with this County ordinance requirement with its implementation. See **VIS-1** and **VIS-3**.

5.15.4 Conclusions and Recommendations

As discussed, explained, and conditioned (see below) in this section, the proposed project would have a *less than significant effect on the environment* for "Aesthetics" according with the CEQA Guidelines, and would be in *conformance* with the identified LORS relating to visual resources per Public Resources Code section 25525.

5.15.5 Proposed Conditions of Certification

The following proposed COCs include measures to both mitigate environmental impacts and ensure conformance with applicable LORS. The COCs below are enforceable as part of the CEC certificate for the portions of the project constituting the site and related facilities. Additional impacts associated with project components outside of the CEC's jurisdiction, such as the well complex licensed by CalGEM and permitted by Imperial County, the temporary structures such as the construction camps, laydown/parking yards, and borrow pits to be permitted by Imperial County, and the switching station to be permitted by Imperial Irrigation District, require mitigation to be less than significant.

This CEQA analysis evaluates impacts resulting from all aspects of the project, and for the entire project to have less than significant impacts, the mitigation actions described in these COCs would need to be implemented by the various licensing jurisdictions as mitigation measures (MMs). For purposes of the facility certification issued by the CEC, the project owner must comply with the following COCs on the jurisdictional site and related facilities as delineated in the **Section 3.1 Project Description**. Verifications set forth below only apply to the COCs, not the MMs.

COC VIS-1/MM VIS-1 The project owner shall use exterior surface coatings, colors, finishes, materials, and a gloss level that diffuse illumination or collection, reflectance and scattering offsite and skyward from the exterior surfaces of the project buildings, equipment, and structures, and specifically include:

a. An exterior surface coating, color, finish, material, and gloss level that minimize contrast and do not introduce specular reflection in the existing physical landscape.

b. An exterior surface coating, color, finish, material, and gloss level that is in conformance with applicable adopted architectural design and site development related policies and ordinances of the County of Imperial.

The project owner shall submit to the CPM for approval an exterior surface coatings, colors, finishes, and materials plan for the project buildings, equipment, and structures that satisfy the above requirements and include the following:

a. A list of the large/major buildings, equipment, structures; perimeter wall and/or fence; transmission line towers and/or poles; above ground pipelines serving the facility onsite and offsite in public view, and a list of their proposed exterior surface coatings, colors, finishes, and materials identified by vendor, name and

number, and according to the RAL color matching system or similar universal designation system.

b. Supply one set of brochures showing coating/color chips, and/or samples of the coatings/colors or finish, materials to be applied/installed to buildings, equipment, and structures.

c. A time schedule for the completion of the application/installation of the coating, color, finish, and materials.

d. A maintenance plan that includes procedures for the upkeep of the coatings, colors, finishes, and materials for the life of the project.

The project owner shall not purchase product or service from a vendor for the project exterior surface coatings, colors, finishes, materials prior to CPM approval of the exterior surface coating, color, finish, and materials plan.

Verification:

a. The project owner shall submit an exterior surface coating, color, finish, and materials plan to the CPM for approval and simultaneously to the Director of Planning and Development Services for the County of Imperial for review and comment ninety (90) days prior to executing a contract to purchase coating, color, finish and materials with a vendor. The Director of Planning and Development Services shall have at least 30 days to review the plan and provide comments to the applicant and the CPM.

b. If the CPM determines that the exterior surface coating, color, finish, and materials plan requires a revision, the project owner shall provide to the CPM a plan with the specified revision(s) for approval by the CPM before any action or activity with the vendor is executed. Any revision to the plan must be approved by the CPM.

c. The project owner shall notify the CPM that exterior surface coatings, colors, and finishes of all listed buildings, equipment, and structures has been completed are ready for inspection. With this notification, the applicant shall supply to the CPM one set of color photographs showing the project from the key observation points evaluated for the project certification, and individual color photographs showing the completed exterior surface coatings, colors, finishes, and materials for the following: the clarifiers, control room, cooling tower, maintenance building, thickener, and any other building, equipment, and structure as requested by the CPM. Color photographs may be electronically filed or manually filed on electronic media.

d. Exterior surface coatings, colors, finishes, and materials shall be installed/applied (completed) on the exterior surfaces of the large/major buildings, equipment, and structures prior to the start of commercial operation.

e. The project owner shall supply a description of the condition (status) of the exterior surface coatings, colors, finishes, and materials for the large/major

buildings, equipment, structures, and others as needed for the reporting year in the Annual Compliance Report. The report shall include:

1. The condition of the exterior surfaces of buildings, equipment, and structures at the end of the reporting year.
2. A listing of maintenance activities performed during the reporting year.
3. A tentative time schedule for maintenance activities for the upcoming year.

COC VIS-2/MM VIS-2 New outdoor light and glare from the project site shall not result in light being a pollutant offsite and skyward, "light pollution." The project owner shall include use of luminaires that:

a. Only be on when needed.
b. Only light the area that needs it.
c. Illuminate no brighter than necessary.
d. Minimize blue light emissions.
e. Are fully shielded (BUG Rating U0).
f. Are "DarkSky Approved" program products.
g. Comply with the applicable adopted outdoor lighting regulations of the County of Imperial.

The project owner shall submit to the CPM for approval and simultaneously to the Director of Planning and Development Services for the County of Imperial for review and comment a light pollution control plan or equivalent plan prepared for the project that satisfy the above requirements and include the following:

a. Supply one set of product brochures and/or printouts (e.g., diagram, drawing) showing and describing the types of outdoor luminaires to be applied/installed to buildings, equipment, structures, and other locations on the project site (lighting schedule).
b. A diagram(s) or drawing(s) of the project site showing the approximate location of the installation/placement of the luminaire and its direction and angle (luminaire location).

Verification:

a. The project owner shall submit a light pollution control plan to the CPM for approval and simultaneously to the Director of Planning and Development Services for the County of Imperial for review and comment ninety (90) days prior to executing a contract to purchase permanent outdoor luminaires for the project. The Director of Planning and Development Services shall have at least 30 days to review the plan and provide comments to the applicant and the CPM.

b. If the CPM determines the light pollution control plan requires a revision, the project owner shall provide to the CPM a plan with the specified revision(s) for approval by the CPM before any action or activity with the vendor is executed. Any revision to the plan must be approved by the CPM.

c. The project owner shall notify the CPM when the installation of the luminaires has been completed and are ready for inspection. After inspection if the CPM requires a modification to a luminaire(s) (e.g., design, installation, location), the project owner shall have 30 days after receiving the notification to complete the modification and request a follow-up inspection.

d. If a light and glare complaint is filed with the project owner within 48 hours of receiving the complaint, the project owner shall supply the CPM with a completed complaint resolution form report as specified in the Compliance Conditions, a proposal to resolve the complaint and time schedule for resolution. The project owner shall notify the CPM within 48 hours after completing/resolving the complaint.

COC VIS-3/MM VIS-3 The project owner shall plant/install and maintain landscaping-related improvements including trees, shrubs, ground cover and similar on new geothermal well sites (drilling and production well sites) in conformance with the applicable adopted Renewable Energy Project standards and Geothermal Projects - Production Standards of the County of Imperial (Imperial County Ordinance, Title 9, Division 17).

The project owner shall submit to the CPM for approval and simultaneously to the Director of Planning and Development Services for the County of Imperial for review and comment a landscape-related improvement, plantings, and irrigation plan (landscaping design plan) or equivalent plan prepared for the project that satisfy the above requirements and include the following:

a. The landscape design plan shall be presented at a reasonable scale. The plan shall include a planting plan with plant list prepared by a qualified landscape architect familiar with local growing conditions of proposed species, specifying installation sizes, growth rates, expected time to maturity, expected size at five years and at maturity, spacing, number, availability, and a discussion of the suitability of the plants for the site conditions; specifications for ground cover, top-dressing of planting areas and weed abatement measures. Existing vegetation (if any) shall be noted on the plan.

b. Landscape-related improvements and the irrigation system on the geothermal production well site shall comply with state and county water conservation/efficient landscaping requirements.

c. A maintenance plan that includes procedures for the upkeep of the landscape-related improvements and the irrigation system on the well site for the life of the project.

Verification:

a. The project owner shall submit a landscaping design plan to the CPM for approval and simultaneously to the Director of Planning and Development Services for the County of Imperial for review and comment ninety (90) days prior to executing a contract to purchase landscaping-related improvements for the project and well sites. The Director of Planning and Development Services shall have at least 30 days to review the plan and provide comments to the applicant and the CPM.

b. If the CPM determines the landscaping design plan requires a revision, the project owner shall provide to the CPM a plan with the specified revision(s) for approval by the CPM before any action or activity is executed. Any revision to the plan must be approved by the CPM.

c. The project owner shall notify the CPM when the planting/installation of the landscaping-related improvements have been completed and are ready for inspection. With this notification, the applicant shall supply to the CPM one set of color photographs showing the landscaping-related improvements on the project and well sites. Color photographs may be electronically filed or manually filed on electronic media. After inspection if the CPM requires a modification to a landscaping-related improvement (e.g., design, installation, location), the project owner shall have 30 days after receiving the notification to complete the modification and request a follow-up inspection.

d. The project owner shall supply a description of the condition (status) of the landscaping-related improvements and the irrigation system, and maintenance activities performed during the reporting year in the Annual Compliance Report.

5.15.6 References

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5.16 Water Resources

James Ackerman and Adam White

5.16.1 Environmental Setting

The proposed Morton Bay Geothermal Project (MBGP or project) would be constructed approximately six miles northwest of Calipatria and consist of a 51-acre power plant complex within a 160-acre parcel, nine production wells, and eleven injection wells. The net power output of the project is expected at 140 megawatts (MWs). The production and injection wells, their platforms, and all aboveground pipelines to transport geothermal fluid except those connecting to the powerplant are licensed under the authority of the California Geologic Energy Management Division (CalGEM). Because these extra-license components are part of the whole of the project, the environmental impact of these aspects of the project are fully evaluated herein.

Aboveground pipelines would transport the geothermal fluids from the production wells to the resource production facility (RPF). The spent geothermal fluids would then be transported by aboveground pipelines to Class V injection wells and returned to the geothermal reservoir. The production and injection wells would be within well pad compounds (50 acres total) outside of the power plant complex.

Soil disturbance associated with linear construction tasks would include 12,032 linear feet of pipeline from production wells, 27,758 linear feet of pipeline to injection wells, an estimated 3,000 linear feet of underground waterline to connect to Imperial Irrigation District (IID) water supply, and 16,992 linear feet of overhead generation line tie-in. Fifty-foot rights-of way would be required for linear construction tasks.

Most grading operations would affect soil to a depth of five feet, although foundations for production/injection pipelines and generation line tie-in poles would be installed to depths of 20 feet and 30 feet, respectively. Project construction would be supported by 600 acres of parking/laydown areas, 206 acres of construction camps, and 460 acres of borrow pit areas, to be shared with the Black Rock and Elmore North geothermal projects. Total soil disturbance associated with the project would include 1,379 acres and 56,782 feet of linear construction tasks (Jacobs 2023a).

Surface Water and Stormwater Drainage

Surface water features near the project include the Salton Sea (approximately two miles west), the New River (approximately 0.8 miles south), the Alamo River (approximately 0.4 miles southwest), and the O and N Lateral irrigation drains adjacent to the north and south of the Project parcel, respectively. Stormwater from the Project site drains toward the Salton Sea. In June 1901, the California Development Corporation began delivering irrigation water to the Imperial Valley by diverting it from the Colorado River through a channel originating from Mexico to the Alamo River. In 1905, the Colorado River flooded and ran uncontrolled through Imperial Valley, inundating 488 square miles of farmland

and creating the Salton Sea. Currently, the Salton Sea is an endorheic lake with no outlet to the ocean, replenished predominantly by farm drainage and seepage, with occasional inputs from stormwater runoff (Jacobs 2023a).

The project would straddle the following two level 12 Hydrologic Unit Code (HUC) watersheds (DWR 2023d) (USEPA 2023):

- Town of Calipatria-Alamo River (HUC 181002040707)
- Town of Niland-Frontal Salton Sea (HUC 181002041109)

The water quality of these two watersheds near the Salton Sea shore is influenced by pollutants contained in stormwater runoff, agricultural tile-drains, and the Alamo River. Drainage from these sources typically contains pollutants such as sediment, salts, ammonia, metals, pesticides, and polychlorinated biphenyls (PCBs). The nearby Salton Sea also contains low levels of oxygen, nitrogen, and phosphorus (USEPA 2023). However, it should be noted that according to the application, during project operation stormwater within the main MBGP complex would internally drain into a retention basin and be reused on-site (Jacobs 2023a).

Outlying production and injection well pad compounds would be constructed with gravel to minimize erosion and a nuisance berm along the perimeter to contain stormwater (Jacobs 2023a).

Groundwater

The project site is within the Imperial Valley groundwater basin (7-030) southwest of the Sand Hills, southeast of the Salton Sea and the Ocotillo-Clark Valley, east of the Coyote Wells Valley and north of the Mexican border. During a geotechnical investigation performed for the project, depth to groundwater was encountered at eight feet below ground surface (bgs) (Jacobs 2023h), which concurs with local Department of Water Resources depth to groundwater data (DWR 2020). Within the Imperial Valley, fluctuations in rainfall, discharge from agricultural tile drains, and other hydrologic factors can influence groundwater levels.

Imperial Valley groundwater is generally of poor quality and is unsuitable for domestic or irrigation use due to high levels of total dissolved solids (TDS), fluoride and boron concentrations. Shallow groundwater in the area is hydraulically connected to the Salton Sea and is very saline. The fine-grained deposits that are characteristic of the area have transmissivities of only 1,000 to 10,000 gallons per day per foot to depths of approximately 500 feet. At greater depths, the transmissivities are likely to be even less (Westec 1981). The low transmissivity of these deposits limits the ability of water to percolate downward into deeper aquifers. As a result, depleted groundwater levels recharge slowly and limit the potential for development in the area. Except for withdrawals made for geothermal energy production, the deep aquifer is too saline for irrigation and most other beneficial uses (Jacobs 2023a).

Evaporation, transpiration, and vegetative uptake concentrate the salinity of shallow groundwater below irrigated crops (USDOI 1970). Shallow groundwater with concentrated salts drains to the Salton Sea via tile drains utilized to drain the shallow groundwater to avoid root damage. The tile drains discharge into canals and local streams that in turn flow into the Salton Sea, further increasing salinity.

Flooding

The proposed project site is on Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) panel 06025C0725C within Zone A. Zone A is defined as areas determined to be within a special flood hazard area subject to inundation by a 1 percent annual chance flood, also referred to as the 100-year flood, without determining a base flood elevation (FEMA 2008). However, the applicant submitted a request to FEMA on May 18, 2023, to revise the special flood hazard area based on declining Salton Sea surface elevation. The petitioned revision has a potential to exclude the project site (Jacobs 2023bb). In addition, to protect the power plant site from flooding, a berm would be constructed and be of adequate height, according to Imperial County requirements, to provide flood protection based on the request for base flood determination, submitted to Imperial County and FEMA.

The project area also is not within an area mapped as vulnerable to sea level rise in the National Oceanic and Atmospheric Administration's (NOAA) *Digital Coast, Sea Level Rise Viewer* (NOAA 2023).

According to the *Dam Breach Inundation Map Web Publisher* sponsored by the California Department of Water Resources (DWR), there are no dams in the region that could cause inundation of the project area in case of a breach. The nearest dam to the project area is the Wide Canyon Dam (approximately 69 miles northwest), which is a flood control dam, and the effect of inundation due to dam failure is minimal and far away from the project area (DWR 2023).

Since the project area is not near the coast, there is no danger of a tsunami. The Salton Sea is a large body of water where a seiche could occur, especially in proximity to the San Andreas fault. However, since the creation of the Salton Sea in 1905, there have been no reported occurrences of seiches at the Salton Sea (Imperial County 1997a).

Regulatory

Federal

Clean Water Act and California's Porter-Cologne Water Quality Control Act. The State Water Resources Control Board (SWRCB) and its nine Regional Water Quality Control Boards (RWQCBs) are responsible for the regulation and enforcement of the water quality protection requirements of the federal Clean Water Act (CWA) and the state's Porter-Cologne Water Quality Control Act (Porter-Cologne). The NPDES is the permitting program that allows point source dischargers to comply with the CWA Section 402 and Porter-Cologne laws. This regulatory framework protects the beneficial uses of the state's

surface and groundwater resources for public benefit and environmental protection. Protection of water quality could be achieved by ensuring the proposed project complies with applicable NPDES permits from the SWRCB or the Colorado River Basin RWQCB.

Section 404(a) of the CWA identifies the U.S. Army Corp of Engineers (USACE) as the authority to issue permits for the discharge of fill and dredging material into navigable waters, defined as waters of the United States (CWA Section 502 [7]). Under Section 401(a) of the CWA, any applicant of a permit under the CWA must provide a state certification to the Federal permitting agency. In the region of the project, the Colorado River Basin RWQCB would be the Section 401 certifying state agency.

Under Section 303(d) of the CWA, states are required to identify impaired surface water bodies and develop total maximum daily loads (TMDLs) for contaminants of concern. The TMDL is the quantity of pollutant that can be assimilated by a water body without violating water quality standards. Both the Town of Calipatria-Alamo River and the Town of Niland-Frontal Salton Sea watersheds include three water bodies listed by the EPA with Impaired Waters for California according to the Section 303(d) List of the Clean Water Act (EPA 2023):

- New River;
    - Ammonia, selenium, bacteria, PCBs, pesticides, chloride, trash, and sediments.
- Imperial Valley Agricultural Drains;
    - Ammonia, selenium, PCBs, pesticides, and sediments.
- Salton Sea;
    - Ammonia, Arsenic, bacteria, low oxygen, pesticides, chloride, and salinity.

Listing of a water body as impaired does not necessarily suggest that the water body cannot support the beneficial uses; rather, the intent is to identify the water body as requiring future development of a TMDL to maintain water quality and reduce the potential for future water quality degradation.

Resource Conservation and Recovery Act (RCRA). 40 CFR parts 144 thru 148 establishes the requirements, procedures and guidelines for the underground injection control (UIC) program to dispose of fluids in the subsurface using injection wells. This regulation also includes establishment of state UIC programs through primacy. Although the USEPA Region IX implements the UIC program for Class V wells, California permits these wells and has substantial responsibility for the program (USEPA 1999) through a memorandum of agreement (USEPA 1991). CalGEM is the agency responsible for permitting Class V injection wells associated with geothermal energy production.

Forty (40) CFR part 261 identifies those wastes which are subject to regulation as hazardous and subject to the notification requirements of section 3010 of RCRA. These definitions exempt geothermal fluids from hazardous waste classification.

Federal Emergency Management Agency Flood Insurance Program. The magnitude of flood used nationwide as the standard for floodplain management is a flood having a probability of occurrence of one percent in any given year, also known as the 100-year flood, or base flood. FIRM, the official map created and distributed by FEMA for the National Flood Insurance Program that shows areas subject to inundation by the base flood for participating communities. FIRMs contain flood risk information based on historic, meteorologic, hydrologic, and hydraulic data, as well as open-space conditions, flood control works, and development. As stated above, the proposed project area is in Zone A and therefore is within the 1 percent annual chance floodplain.

State

The Safe Drinking Water And Toxic Enforcement Act of 1986 (Proposition 65). The Safe Drinking Water and Toxic Enforcement Act of 1986, Health and Safety Code section 25249.5 et seq., prohibits the discharge or release of chemicals known to cause cancer or reproductive toxicity into drinking water sources.

Public Resources Code, Division 3, Chapter 4, Sections 3700-3776. This part of California statute requires that geothermal wells be drilled, operated, maintained, and abandoned in such manner as to encourage the greatest recovery of geothermal resources, as well as preventing damage to life, health, and the environment. CalGEM reviews and approves geothermal well permits per California Code of Regulations (CCR), Title 14, Sections 1930 thru 1937.2. The substantive articles within the remainder of CCR Title 14, Chapter 4, Subchapter 4 address drilling, blowout prevention, completion and production, injection, subsidence, and plugging and abandonment.

California Constitution, Article X, Section 2. This section requires that the water resources of the State be put to beneficial use to the fullest extent possible. The waste, unreasonable use or unreasonable method of use of water is prohibited. The conservation of such waters is to be exercised with a view to the reasonable and beneficial use in the interest of the people and for the public welfare. The right to water from any natural stream or water course in the State is and shall be limited to such water as shall be reasonably required for the beneficial use to be served, and such right does not extend to the waste or unreasonable use, or unreasonable method of diversion of water. This section is self-executing, and the Legislature may also enact laws in the furtherance of the policy contained in this section.

State Water Resources Control Board Policy 75-58. The SWRCB has also adopted policies that provide guidelines for water quality protection. The principal policy of the SWRCB which addresses the specific siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling (Resolution 75-58 adopted on June 19, 1976). This policy states that use of fresh inland waters should only be used for powerplant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. This SWRCB policy requires that power plant cooling water should come from, in order of priority:

- wastewater being discharged to the ocean

- ocean water
- brackish water from natural sources or irrigation return flow
- inland waste waters of low total dissolved solids
- other inland waters

This policy also addresses cooling water discharge prohibitions. The applicant has evaluated the water quality needs and the economic feasibility for 14 percent of the cooling water makeup and determined that fresh water would be required (Jacobs 2023a).

Waste Discharge Requirements and Water Quality Monitoring, CCR Title 27. State regulation (CCR Title 27, Section 21710 §) gives the SWRCB and affiliated Regional Boards the authority to establish Waste Discharge Requirements (WDRs) for any instance where solid waste (including liquids) would be discharged to land and water quality could be affected. This would apply to the Class II surface impoundment, or brine pond, proposed to hold geothermal fluids post energy production and prior to underground injection. This regulation also includes the program to monitor groundwater quality in the vicinity of the discharge facility (CCR Title 27, Section 20380 §).

California Well Standards, Bulletins 74-81 and 74-90. To address the increase of water wells drilled during the 1976-77 drought, the California Department of Water Resources (DWR) created state-wide standards for drilling and construction of water wells in December 1981 (Bulletin 74-81). A supplement to this document (Bulletin 74-90) was prepared specifically for monitoring wells in June 1991. A DWR advisory was issued in September 2015 providing additional guidelines concerning water well annulus sealing materials.

Onsite Wastewater Treatment Systems. The Federal CWA, the California Water Code, and the Porter-Cologne Act authorizes SWRCB and associated regional boards to regulate discharges that could impact surface and groundwater. SWRCB in turn delegates this authority to local agencies with respect to onsite wastewater treatment systems (OWTS) through the Local Agency Management Program (LAMP). The Imperial County Department of Public Health Division (ICDPH) is the local agency responsible for OWTS such as septic systems under County Ordinance 1516. A septic system to serve the MBGP facility during operations is proposed as part of the project.

Local

Imperial County Ordinance, Title 9, Division 31, Sections 930101.00 thru 930107.00. Among other stormwater related provisions, this county ordinance requires an erosion and sediment control plan when applying for a grading permit. In addition, county agencies have "stop work authority" for any construction activity that is creating a non-stormwater discharge or any discharge that is in violation of county stormwater ordinances.

Imperial County Flood Damage Prevention Regulation, Title 9, Division 16, Section 91605.00. This county regulation pertains to floodproofing standards on new construction in special flood hazard zones.

Imperial County Ordinance, Title 9, Division 17, Sections 91701.00 thru 91702.02. These county ordinances pertain to geothermal projects and require a conditional use permit and contain geothermal well drilling and energy production standards.

Cumulative

Section 15130 of the California Environmental Quality Act (CEQA) Guidelines (Cal. Code Regs., tit. 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The CEQA Guidelines require that the discussion reflect the severity of the impacts and the likelihood of their occurrence but need not provide as much detail as the discussion of the impacts attributable to the project alone.

Pursuant to CEQA, a cumulative impacts analysis can be performed by either 1) summarizing growth projections in an adopted general plan or in a prior certified environmental document, or 2) compiling a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this Staff Assessment. Section 1 Executive Summary, Table 1-1.

In addition to the proposed MBGP, the applicant is concurrently pursuing certification of two other geothermal projects in the vicinity; Black Rock geothermal (77 MWs) and Morton Bay geothermal (140 MWs). Therefore, the cumulative environmental impact of all three projects needs to be considered. With respect to water supply, the combined estimated water supply for all three geothermal projects proposed by the applicant is 13,165 acre-feet per year (AFY). IID has available for non-agricultural uses up to 25,000 AFY, of which 6,380 AFY has been committed to other customers. (IID 2009). Based on email communication with IID, as of January 2024, a remainder of 18,620 AFY (IID 2024) is available to future uses. The water supply estimated for the three applicant projects constitutes nearly 71 percent of the available supply.

5.16.2 Environmental Impacts

WATER RESOURCES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
Would the project: a. Violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☒	☐	☐

WATER RESOURCES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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:				
i. result in substantial erosion or siltation, on- or offsite;	☐	☒	☐	☐
ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☒	☐	☐
iii. create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff; or	☐	☒	☐	☐
iv. impede or redirect flood flows?	☐	☒	☐	☐
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☒	☐	☐
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☒	☐	☐
f. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☒	☐	☐
g. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☒	☐	☐

Environmental checklist established by CEQA Guidelines, Appendix G, hydrology and water quality and utilities and service systems.

5.16.2.1 Methodology and Thresholds of Significance

The California Environmental Quality Act (CEQA) guidelines, Appendix G, provide a checklist of questions that lead agencies typically address when assessing impacts related

to water resources (or hydrology and water quality in CEQA). To assess potential impacts concerning water resources, staff has reviewed online sources of maps, literature and information of the surrounding area, as well as site-specific information provided by the project applicant. In addition, CEC staff met with IID regarding concerns of delivering water supply to the project. Thresholds of significance are not applicable to this evaluation.

5.16.2.2 Direct and Indirect Impacts

a. Would the project violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Construction

Less Than Significant Impact with Mitigation. The entire proposed project including well pads, linear tasks and support areas would disturb approximately 1,379 acres and 56,782 feet of linear facilities during construction and be subject to construction-related stormwater requirements of the Construction General Permit. Prior to any ground-disturbing construction activity, the applicant would prepare a construction Stormwater Pollution Prevention Plan (SWPPP) to comply with the Construction General Permit. With the implementation of the SWPPP, development of the site would not cause substantial degradation in the quality, or an increase in the rate or volume, of stormwater runoff from the site during construction. Staff proposes condition of certification (COC) **WATER-1** to ensure the project complies with the Construction General Permit.

According to the application's project description, soil would be disturbed to a maximum depth of 30 feet below grade while installing foundation piers using drilling equipment (Jacobs 2023a). It is therefore likely that groundwater could be encountered during excavation activities and dewatering would be necessary. If dewatering is necessary, and the discharge is found to be uncontaminated, the project owner would be permitted to discharge this to waters of the U.S. under the Construction General Permit. If the discharge is found to be contaminated, a special permit through the Colorado River Basin RWQCB would be necessary depending on the nature of the contamination, requiring the applicant to treat the water before discharging or hauling away the untreated water by a permitted service provider.

During construction, generated wastewater would be accommodated by portable toilets at the construction sites and portable restrooms, showers, and kitchens at the crew construction camps. The portable facilities would store wastewater for removal and disposal at an appropriate wastewater facility.

Prior to construction, the applicant will have to obtain a jurisdictional delineation by the US Army Corp of Engineers (USACE) confirming the waters of the US identified by the applicant that will be impacted by the project. After this determination has been approved by USACE, applicant would obtain appropriate federal approval and certifications that the

federally permitted activity is consistent with federal and state water quality standards. (For a discussion on the project's impact to wetlands and potential waters of the US and state and recommended mitigation, see Section 5.2, Biological Resources and, specifically Condition of Certification **Bio-22**) These required federal permitting steps have not been completed, but doing so will mitigate the otherwise significant impact of failing to comply with applicable laws.

Thus, the project would not be expected to violate water quality standards or waste discharge requirements during construction, and impacts would be less than significant.

Operation

Less Than Significant Impact with Mitigation. Since the facility compound would be internally drained to a retention basin, a project operations Drainage, Erosion, and Sedimentation Control Plan (DESCP) should be prepared to monitor and manage stormwater events per **WATER-2**.

Geothermal fluids following use in power production, would be temporarily stored in a concrete-lined brine pond. As a surface impoundment, the brine pond would be regulated by the Colorado River Basin RWQCB under the Land Disposal Program. Compliance with the Land Disposal Program per regulation (CCR Title 27, §§ 20380 and §§ 21710) is described in **WATER-3**.

Ultimately the geothermal brine would be injected underground to replenish the geothermal reservoir. This would be accomplished using Class II injection wells under the Underground Injection Control (UIC) program administered by CalGEM. CalGEM would permit both production and injection wells, and the UIC project per regulation (CCR Title 14, §§ 20380 and §§ 21710) as described in **WATER-5**.

To process sanitary wastewater from restroom and kitchen facilities, the project would include an on-site septic system that would incorporate an evapotranspiration (EV) bed downstream of the septic tank (Jacobs 2023bb). Through the permitting process, the Imperial County Division of Environment Health (ICDEH) would evaluate the septic system design and site conditions to ensure the proposed facility would conform with OWTS requirements. During the application process, the applicant conferred with the ICDEH resulting in the design for an EV bed septic system as described in **WATER-7**.

The project would not be expected to violate water quality standards or waste discharge requirements during operation, and impacts would be less than significant with mitigation.

b. Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the

basin?

Construction and Operation

No Impact. Water supply during both the construction and the operation phases of the project would be provided by the IID, therefore there would be no impact on groundwater resources due to project construction or operation.

c. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces in a manner which would:

i. Result in substantial erosion or siltation, on- or offsite;

Construction and Operation

Less Than Significant Impact with Mitigation. As discussed in criteria (a), the impact of erosion during project construction would be addressed by the SWPPP prepared as part of the requirement of the Construction General Permit described in **WATER-1**.

During operations the facility would drain internally into a retention basin and stormwater runoff would be further addressed by the project operations DESCP prepared per **WATER-2**.

The project would not be expected to cause substantial erosion during either construction or operation, and impacts would be less than significant with mitigation.

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

Construction and Operation

Less Than Significant Impact with Mitigation. As discussed in criteria (a), the impact of on or off-site flooding due to surface water runoff from construction activities would be addressed by the SWPPP prepared by requirement of the Construction General Permit (per **WATER-1**). During operations the facility would drain internally into a retention basin and stormwater runoff would be further addressed by the project operations DESCP prepared per **WATER-2**.

The project would not be expected to cause on- or off-site flooding due to surface water runoff during construction or operation, and impacts would be less than significant with mitigation.

iii. Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff; or

Construction and Operation

Less Than Significant Impact with Mitigation. Currently, a system of ditches is in place as part of the agricultural infrastructure to drain tailwater and tile discharge into the Salton Sea. However, as discussed in item (a) above, stormwater runoff during construction would be minimized by the practices employed per the Construction General Permit SWPPP (per **WATER-1**). During operation the facility would drain internally into a retention basin. Stormwater runoff outside the facility would be further addressed by the project operations DESCP prepared per **WATER-2**.

The project would not be expected to create surface water runoff that would exceed stormwater drainage capacity either during construction or operation, and impacts would be less than significant with mitigation.

iv. Impede or redirect flood flows?

Construction and Operation

Less Than Significant Impact with Mitigation. Currently, the project site is in Zone A according to the FEMA Flood Insurance Rate Map panel 06025C0725C. Zone A is defined as areas determined to be within a special flood hazard area subject to inundation by a one percent chance (or 100-year) flood without a base flood elevation (FEMA 2008). However, the applicant submitted a request to FEMA on May 18, 2023, to revise the special flood hazard area based on declining Salton Sea surface elevation, which seeks to exclude the project site (Jacobs 2023bb). Given the current levels of the Salton Sea at -240.27 feet below mean sea level (MSL) (USGS 2024), approximately 11 feet below the project site, and that agricultural drains are in place, it is doubtful that flood waters would accumulate in the project vicinity.

However, as discussed in item (a) above, flood water flow would be addressed during construction by **WATER-1,** and during operation by **WATER-2**.

The project would not be expected to impede or redirect flood water flow either during construction or operation, and impacts would be less than significant with mitigation.

d. Would the project in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Construction and Operation

Less Than Significant Impact with Mitigation. As discussed in criterion (c) (iv), the likelihood of accumulating flood water is low and if flood water flow did occur, it would be addressed during construction by **WATER-1,** and during operation by **WATER-2**;

therefore, the impact would be less than significant with mitigation. The project site is currently identified as located within a 100-year floodplain (FEMA 2008). The applicant has submitted a letter of map revision (LOMR) to FEMA to revise the 100-year floodplain area based on the current hydraulic conditions that have substantially changed since the date of the FEMA FIRM. If the floodplain is revised as proposed by the LOMR the location of the proposed brine pond would be excluded from the 100-year floodplain (Jacobs 2023bb). If this map revision is not approved by FEMA, design of the brine pond would need to be modified to mitigate the flood impact to comply with the WDRs as describe in COC **WATER-3**.

Since the project is not near the coast, the possibility of a tsunami does not exist. The Salton Sea is a large body of water where a seiche could occur, especially in proximity to the San Andreas fault. However, since the creation of the Salton Sea in 1905, there have been no reported occurrences of seiches at the Salton Sea (Imperial County 1997a) and the likelihood of a seiche affecting the project site is less than significant.

Therefore, the overall impacts of flood hazard, tsunamis or seiches affecting the project during construction and operation would be less than significant with mitigation.

e. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Construction and Operation

Less Than Significant Impact with Mitigation. Groundwater would not be used as water supply during either construction, or operation. The impact of the project on water quality due to erosion during construction would be mitigated by the Construction General Permit SWPPP (**WATER-1**), and by the project operations DESCP prepared per **WATER-2** during project operation.

Thus, the project would not affect any sustainable groundwater management plan and **WATER-1** and **WATER-2** would augment any regional water quality control plan, such as the Basin Plan administered by the Colorado River Basin-RWQCB. Therefore, the overall impacts of the project on groundwater management plan and water quality control plans during construction and operation would be less than significant with mitigation.

f. Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Construction and Operation

Less Than Significant Impact with Mitigation. Water supply during both construction and operation would be provided by IID. The estimated water demand during construction would be 363 acre-feet (AF) over the 29-month construction schedule, averaging about 150 AFY. The estimated water demand during project operation would be approximately 5,560 AFY. During the water resources impact evaluation, California Energy Commission

(CEC) staff expressed concerns regarding IID's ability to supply water for the MBGP, as well as the total water demand for all three geothermal projects proposed by the applicant (13,165 AFY). Staff's concern is based on IID's standing policy to supply water to non-agricultural projects, as well as the existing trends of diminishing supply and increasing demands on Colorado River water resources, threatening mandatory rationing in the future.

IID's Interim Water Supply Policy (IWSP) for non-agricultural projects (IID 2009) sets aside 25,000 AFY for non-agricultural use by means of water efficiency conservation programs. As of January 2024, 6,380 AFY has already been committed by water agreement, leaving 18,620 AFY for all other non-agricultural projects (CEC 2024k). The combined annual operational water demand of the three BHER geothermal projects constitutes 71 percent of the remaining IWSP water intended for non-agricultural projects.

CEC staff has expressed these concerns in several communications and data requests. In a meeting on March 7, 2024, IID reassured CEC staff that the obligations to water agreements for the three BHER geothermal projects would be fulfilled (CEC 2024i). However, based on the possibility that there could be water conservation measures in the future, **WATER-8** is proposed to track water consumption both during project construction and operation.

In addition, CEC staff has noted that a service water pond with a surface area of 280,000 square feet is proposed to hold IID provided water until used by the facility. Assuming the pond would be continuously holding water, accounting for the pond surface area, and using an average annual pan evaporation rate of 105.35 inches or 8.78 feet from a monitoring station in the region (WRCC 2024), an evaporative loss of 56.46 AFY is estimated. Although this is a small amount compared to the annual water demand of 5,560 AFY for the project, the amount seems significant enough to recover the water savings. Therefore, **WATER-9** is proposed to minimize evaporation loss by incorporating a floating cover over the open service water pond.

Considering IID's reassurance that water agreements for MBGP would be honored, concerns for possible water use restrictions in the future, and **WATER-8** and **WATER-9**, the impact of water supply for the project is considered less than significant with mitigation.

g. Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Construction and Operation

Less Than Significant Impact with Mitigation. Due to the location of the project, there is no wastewater treatment provider that could feasibly service the facility. As described in

item (a) above, wastewater generated during construction would be accommodated by portable toilets at the construction sites. Wastewater from the portable restrooms, showers, and kitchens at the crew construction camps would be stored until transported to an off-site wastewater facility for appropriate disposal. During operation, sanitary wastewater from restroom and kitchen facilities would be processed by an on-site septic system incorporating an EV bed. The septic system design would be evaluated by the ICDEH to conform with OWTS requirements per **WATER-7**.

The project would not be expected to violate water quality standards or waste discharge requirements during construction or operation, and impacts would be less than significant with mitigation.

5.16.2.3 Cumulative Impacts

The applicant is concurrently pursuing certification of two other geothermal projects in the vicinity in addition to MBGP; Black Rock (77 MWs) and Elmore North (140 MWs), and the cumulative environmental impact of all three projects are therefore considered. With respect to water supply, the combined estimated water supply for all three projects is 13,165 AFY. The original non-agricultural project designation per the IID IWSP was 25,000 AFY (IID 2009). Based on an IID email communication, two Will-Serve Letters have been issued to other customers for a total of 6,380 AFY as of January 2024 (IID 2024). This leaves a remainder of 18,380 AFY for the IWSP designation, and the estimated water supply for the three geothermal projects constitutes nearly 71 percent of this designation. In a meeting on March 7, 2024, IID representatives assured CEC staff that IID would be able to provide water supply for the three proposed geothermal projects.

Currently there are 11 operating geothermal power plants with a combined capacity of approximately 395 MWs (Jacobs 2023r). Adding in the three proposed BHER geothermal projects (357 MWs) and the Hell's Kitchen geothermal project in development (50 MWs), existing and planned geothermal projects would total 802 MWs. Given the estimated 2,950 MW power potential of the SSGF (Kaspereit et al. 2016), it is expected that other geothermal projects are likely to be developed in the future. The impacts of water resources, as well as other environmental concerns, would need to be assessed if these projects are proposed in the future. Since specific projects are speculative at this time, a cumulative impacts analysis regarding water supply cannot be provided.

5.16.3 Applicable LORS and Project Conformance

Table 5.16-1 staff's determination of conformance with applicable local, state and federal LORS, including any proposed Conditions of Certification, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific conditions of certification, the proposed project would be consistent with all applicable LORS. The subsection below, "Proposed Conditions of Certification," contains the full text of the referenced conditions of certification.

TABLE 5.16-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
Federal	
Clean Water Act, U.S. Code § 1342 (b) allows states to establish programs to issue NPDES permits.	**Yes.** During construction of the project, a storm water permit would be obtained under the General Construction NPDES program administered by the SWCRB and Colorado River Basin RWQCB as described in **WATER-1** per authority granted under U.S. Code § 1342 (b).
Resource Conservation and Recovery Act,40 CFR § 144-148: Establishes the requirements, procedures and guidelines for the UIC program to dispose of fluids in the subsurface using injection wells. This regulation also includes establishment of state UIC programs through primacy.	**Yes.** A UIC project would be established administered by CalGEM as described in **WATER-5,** per 40 CFR § 144-148 primacy authority.
State	
Geothermal Well/UIC Program Regulations, CCR Title 14: § 1930; Describes the permitting procedures and drilling standards for geothermal wells. § 1960; Describes the requirements for the UIC program as administered by CalGEM by authority through primacy under RCRA\	**Yes.** Geothermal wells would be permitted and installed per CCR Title 14, § 1930 and a UIC project would be established following the requirements CCR Title 14, § 1960 as described in **WATER-5**.
California Constitution, Article X, § 2: Requires that water resources be used in the most beneficial way possible.	**Yes.** The applicant evaluated the quality of water required for cooling water make-up and dilution of the brine to be injected back into the geothermal reservoir. It was determined fresh water was necessary.
Waste Discharge Requirements, CCR Title 27: § 21710; Gives the SWRCB and affiliated Regional Boards the authority to establish WDRs § 20380; defines the program to monitor groundwater quality in the vicinity of the discharge facility.	**Yes.** The brine pond would be permitted, and groundwater quality would be monitored in accordance with CCR Title 27 per **WATER-4**.
California Well Standards, Bulletins 74-81 and 74-90: State well installation standards	**Yes.** Monitoring wells for the brine pond detection monitoring program and geothermal production/ injection wells would be installed per California well standards per **WATER-4** and **WATER-5.**
Local Agency Management Program (LAMP) for Onsite Wastewater Treatment Systems (OWTS)	**Yes.** As the designated agency, the ICDEH would determine if the proposed septic system conforms with SWQCB OTWS requirements per **WATER-6**.
Local	
Imperial County Ordinance/Regulation:	
§ 91701.03; Renewable energy projects, including geothermal, require permitting through the issuance of a conditional use permit.	**Yes.** A conditional use permit would be required for the project prior to construction.
§ 91702.01; Drilling standards for geothermal wells and projects.	**Yes**. Geothermal production and injection wells would be installed according to Imperial County and State drilling standards per **WATER-5**.
§ 93104.01; Requires an erosion and control plan to obtain a grading permit.	**Yes.** An erosion and control plan would be prepared prior to construction per **WATER-2.**
Flood Damage Prevention Regulations § 91605.00; Requires a California registered professional	**Yes**. This requirement would be fulfilled by **WATER-6**

TABLE 5.16-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
engineer or architect certifies the floodproofing methods.	

5.16.4 Conclusions and Recommendations

As discussed above, with implementation of the staff recommended conditions of certification, and mitigation as described for portions of the project not under the jurisdiction of the CEC's permit, the project would have a less than significant impact related to water resources and would conform with applicable LORS. Staff recommends adopting the conditions of certification as detailed in subsection "5.16.5 Proposed Conditions of Certification" below.

5.16.5 Proposed Conditions of Certification

The following proposed COC/MMs include measures to both mitigate environmental impacts and ensure conformance with applicable LORS. The conditions below are enforceable as part of the CEC's certificate for the portions of the projects constituting the site and related facility. Additional impacts associated with project components outside of CECs jurisdiction, such as the well complex licensed by CalGEM, the temporary structures such as the laydown yard to be permitted by Imperial County, and the switchyard to be permitted by IID, require mitigation to be less than significant.

This CEQA analysis evaluates all impacts resulting from all aspects of the project, and for the entire project to have less than significant impacts, the mitigation actions described in these COC/MMs would need to be implemented by the various licensing jurisdictions as mitigation measures (MMs). For purposes of the facility certification issued by CEC, the following COC/MMs must be complied with by the applicant on the jurisdictional site and related facilities as delineated in the Project Description, Section 3.1. Verifications set forth below only apply to the COCs, not the MMs.

NPDES CONSTRUCTION PERMIT REQUIREMENTS

COC WATER-1/MM WATER-1 The project owner shall manage stormwater pollution from the site and related facilities portions of project construction activities by fulfilling the requirements contained in State Water Resources Control Board's NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (General Permit) (Order No. 2022-0057-DWQ, NPDES No. CAS000002) and all subsequent revisions and amendments. Entering into the General Permit also complies with Imperial County construction-phase stormwater control ordinance 93104.00. Among the requirements of the General Permit, the project owner shall file permit registration documents electronically using the Stormwater Multiple Applications and Report Tracking Systems (SMARTS), submit a Notice of Intent (NOI), and develop and implement a construction Stormwater Pollution Prevention Plan (SWPPP) for the construction of the project (Construction SWPPP). The SWPPP shall include all applicable best

management practices (BMPs) for the project construction activities conducted in the local environment. The SWPPP must be prepared by a State-Qualified SWPPP Developer (QSD). In addition, the SWPPP shall also satisfy stormwater and erosion control measures of the Imperial County ordinance and the requirements of the Imperial County grading permit.

Verification: At least thirty (30) days prior to site mobilization, the project owner shall submit to the Compliance Project Manager (CPM) proof that the construction permit has been granted and that a waste discharge identification number (WDID) was issued by the SWRCB. Within ten (10) days of its mailing or receipt, the project owner shall submit to the CPM any correspondence between the project owner and the SWRCB or the Colorado River Basin Regional Water Quality Control Board (CRBRWQCB) about the General Permit for discharge of stormwater associated with this activity. The project owner shall notify the CPM in writing of any violations and include these in the annual compliance report. Any monitoring documentation associated with the SWPPP shall be included in the annual compliance report.

CONSTRUCTION EROSION AND SEDIMENTATION PLAN OPERATIONS DRAINAGE, EROSION AND SEDIMENTATION PLAN

COC WATER-2 Prior to commencing project operations, the project owner shall obtain CPM approval of a site-specific DESCP that addresses all project elements of stormwater management during project operations. The DESCP shall include the following:

- Discussion, site maps, plans and applicable BMPs demonstrating how stormwater and sediment erosion shall be managed during plant operation.
- Discussion of BMPs deployment and materials management practices at the project site.
- Discussion and schedule of BMP inspections, storm event monitoring, and stormwater management structure maintenance.

Verification: At least thirty (30) days prior to project operation, the project owner shall submit a copy of the Operations DESCP to the CPM for review and approval. The project owner shall notify the CPM in writing of any reported non-compliance and include these in the annual compliance report. Any monitoring documentation associated with the DESCP shall be included in the annual compliance report.

WASTE DISCHARGE REQUIREMENTS

COC WATER-3 The project owner shall comply with Waste Discharge Requirements (WDRs) established in Appendix D. Compliance with Appendix D will assure protection of water resources associated with facility operation. Appendix D was developed in consultation with staff of the Colorado River Basin RWQCB (RWQCB) and includes discharge prohibitions, monitoring requirements, and other specifications provided by the RWQCB staff for future adoption by the Board, as

appropriate to facilitate enforcement activities by the RWQCB. In accordance with the Memorandum of Understanding between the two agencies, the Commission staff and RWQCB staff will confer with each other and coordinate, as needed, in the enforcement of Conditions of Certification and WDRs. Title 27 prescriptive standards for design and construction of the surface impoundment (brine pond) for siting within a flood zone, waste separation from groundwater, necessary freeboard, and slope stability considerations shall be complied with as set forth in the WDRs.

The proposed WDRs include siting restrictions specifying Waste Management Units cannot be sited within a 100-year floodplain. The Applicant's proposed berm design may only be in compliance with FEMA regulations (Title 44, CFR, Part 65.10) for levee design for flood protection if designed, constructed and maintained to preclude the site from 100-year flood events. The Applicant has applied to FEMA for a Letter of Map Revision to allow for this method of compliance, and upon approval, shall apply for a Conditional Letter of Map Revision from FEMA or the local Flood Manager that demonstrates the berm would be constructed to protect the area inside of the berm from a 100-year flood. Approval of a Conditional Letter of Map Revision is required to demonstrate compliance with siting restrictions specified in the WDRs.

The WDRs include siting restrictions specifying a minimum of five feet (5 ft.) above the highest anticipated elevation of underlying ground water (WDR, Part D.1. per CCR Title 27, §20240, (c)). Brine pond design, as currently proposed, does not show compliance with this prescriptive standard and may only be approved if the elements of CCR Title 27, §20080(b)&(c) are met. Brine pond design must also demonstrate compliance by showing that that the design would provide sufficient capacity to handle a design storm while maintaining a required two-foot freeboard, as specified in WDR, Part D.2. Brine pond design must also demonstrate compliance that the design provided would be capable of withstanding the maximum credible earthquake, as specified in WDR, Part 5.e. In addition, a slope stability analysis per CCR Title 27, §21750(f)(5), as recommended in the preliminary geotechnical investigation, is required, and shall include a site-specific ground motion hazard analysis. Revised design information demonstrating compliance with these provisions is required.

Full compliance with Title 27 includes submittal of these additional documents: a quality assurance plan, an operational plan, a closure plan, and financial assurance cost estimates, among others as listed in the regulation, for the reliable and responsible construction and operation of the brine pond. CPM approval of final documents is required to demonstrate compliance with siting requirements specified in the WDRs.

Verification: Prior to discharging any waste (including geothermal fluids from well construction, operational brine waste from clarifiers, or any other ancillary waste

streams) to the brine pond, the project owner shall submit the following documents to the CPM to be forwarded to RWQCB:

1. Written approval of a Conditional Letter of Map Revision from FEMA or the local Flood Manager along with correspondence in agreement or authorization from the Regional Board that the facility complies with the siting restrictions specified in the WDRs.
2. Revised construction drawings and details showing brine pond siting would comply with terms and conditions of WDRs or proposed engineered alternatives including the necessary demonstrations for approval pursuant to Title 27.
3. Design calculations, prepared by a licensed professional engineer, demonstrating pond design would provide sufficient capacity to handle a design storm while maintaining a required two-foot freeboard, and that the brine pond design is otherwise in compliance with terms and conditions of the WDRs.
4. A slope stability analysis report, prepared by a licensed professional engineer or geologist, to include a site-specific ground motion hazard analysis, demonstrating that the brine pond, as designed, would withstand a maximum credible earthquake without damage to the foundation or to the structures that control leachate, or surface drainage, or erosion, and that the brine pond design is otherwise in compliance with terms and conditions of the WDRs.
5. Final documents including a quality assurance plan, an operational plan, a closure plan, and financial assurance cost estimates, prepared by a licensed professional engineer, prepared in compliance with terms and conditions of the WDRs.

The project owner shall provide to the CPM in the ACR, all monitoring reports as required by the WDRs. Any change to the design, construction, or operation of the surface impoundment shall be requested by the project owner in writing to the CPM, and approved by the CPM, in consultation with the RWQCB, prior to the initiation of any construction and/or operational changes.

DETECTION MONITORING WELLS

COC WATER-4 The monitoring well network associated with the WDRs required in WATER-3 shall comply with the requirements of a detection monitoring program as described in CCR Title 27, Section 20380. Wells installed to monitor groundwater quality in the vicinity of the brine pond shall conform to the California Department of Water Resources Bulletins 74-81 and 74-90.

Verification: At least sixty (60) days prior to construction, the project owner shall submit to the CPM and the Colorado River Basin RWQCB, for review and approval, the Groundwater Quality Monitoring and Reporting Plan presenting all the data and information necessary to establish a well network to monitor groundwater quality in compliance with Title 27 regulation.

At least thirty (30) days prior to the start of construction, the project owner shall begin installation of the detection monitoring wells per the Groundwater Quality Monitoring and Reporting Plan.

At least thirty (30) days prior to the start of construction, a pre-construction groundwater quality report shall be submitted to the CPM and the Colorado River Basin RWQCB for review and approval.

Subsequent groundwater quality monitoring reports shall be submitted semi-annually by the project owner to the CPM and the Colorado River Basin RWQCB for review and approval.

PRODUCTION/INJECTION WELL INSTALLATION

COC WATER-5 The project owner shall notify the CPM when the Underground Injection Control (UIC) permitting process begins and shall provide a copy of the UIC permit issued by CalGEM. The project shall not **r**eceive geothermal brine from or discharge to these wells without the final permit in place or without emergency/temporary authorization from CalGEM. The project shall provide to the CPM on a continuing basis, copies of all monitoring or other reports, as well as any changes made to the permit by CalGEM related to the operation of these wells.

Verification: At least thirty (30) days prior to the installation of any production or injection well, the project owner shall provide the CPM all information required to obtain a permit from CalGEM. The project owner shall notify the CPM when the UIC permitting process begins. No later than fifteen (15) days prior to the construction of the injection wells, the project owner shall submit copies of the final UIC permit to the CPM. All copies of permit changes and monitoring or other reports must be received within thirty (30) days of their submittal to CalGEM.

FLOODPROOFING METHODS CERTIFICATION

COC WATER-6 The project owner shall obtain certification by a California registered civil engineer or architect that the floodproofing methods for the project meet the floodproofing criteria in Section 91605.00 (c)(2) of the Imperial County Flood Damage Prevention Regulations.

Verification: No later than 30 days prior to start of commercial operation, the project owner shall submit the required engineer certification of floodproofing methods to the CPM for review and approval and to Imperial County for review. This verification must be provided prior to the start of commercial operation.

ONSITE SEPTIC SYSTEM PERMIT REQUIREMENTS

COC WATER-7 The project owner shall install an on-site septic system designed for site-specific soil and percolation conditions. The septic system design shall comply with the SWRCB's onsite wastewater treatment system (OWTS) regulations (Title 27 CCR) and Imperial County Division of Environmental Health (ICDEH) OWTS permit

requirements. The project owner shall operate the septic system following an operations and maintenance manual prepared by a qualified professional. The project owner shall monitor the septic system for detectable effects on groundwater or surface water. If the site conditions are unfavorable to support a conventional leach field system, the project owner shall work with the SCEHD and the CPM to evaluate a viable alternative.

Verification: No later than 90 days prior to project operation, the project owner shall submit to the CPM evidence that the septic system design has the approval of the chief building official (CBO), and evidence that it has been reviewed by the ICDEH. No later than 60 days prior to project operation, the project owner shall submit the operations and maintenance manual to the ICDEH for review and comment. No later than 30 days prior to project operation, the project owner shall submit the operations and maintenance manual to the CPM for review and approval. The submittal shall include copies of any agency comments the project owner has received. The wastewater system shall be monitored following either the general standards adopted in SWRCB's OWTS regulations or the procedures outlined in the CPM-approved operations and maintenance manual. Any testing results or correspondence exchanged between the project owner and the California Department of Health Services or the ICDEH during operations shall be provided to the CPM in the annual compliance report.

WATER USE AND REPORTING

COC WATER-8/MM WATER-8 Supply of fresh water for the project construction will be provided by the IID. The project owner shall enter into an agreement with IID. Project water use for project construction shall not exceed 365 acre-feet. Project operation water use shall not exceed 6,500 AFY. The project owner shall record daily water use for the project's construction and operation. The project owner shall comply with the water use limits and reporting requirements described below.

Verification: During project construction, the monthly compliance report shall include a summary of monthly water use. After construction is complete, the project's annual compliance report shall include a monthly and annual summary of water use.

COC WATER-9 To avoid loss of water supply due to evaporation, the project owner shall install a floating cover over the proposed service water pond.

Verification: No later than thirty (30) days prior to project construction, the project owner shall provide the CPM the specifications for the floating pond cover for review and approval. No later than thirty (30) days prior to power plant operation, the project owner shall provide to the CPM confirmation that the floating cover has been implemented.

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Section 6

Environmental Justice

6 Environmental Justice

Ellen LeFevre

6.1 Environmental Setting

The United States Environmental Protection Agency (U.S. EPA) defines environmental justice (EJ) as, "the fair treatment and meaningful involvement of all people regardless of race, color, national origin or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies" (U.S. EPA 2015, page 4).

The "Environmental Justice in the Energy Commission Site Certification Process" subsection immediately below describes why EJ is part of the California Energy Commission (CEC) site certification process, the methodology used to identify an EJ population, and the consideration of California Environmental Protection Agency's (CalEPA) California Communities Environmental Health Screening Tool (CalEnviroScreen 4.0). Below that, the "Project Outreach" subsection discusses the CEC's outreach program specifically as it relates to the proposed project. Lastly, the "Environmental Justice Project Screening" subsection presents the demographic data for those people living in a six-mile radius of the project site and a determination on presence or absence of an EJ population. When an EJ population is identified, the analyses in 11 technical areas[1] consider the project's impacts on this population and whether any impacts would disproportionately affect the EJ population.

Environmental Justice in the Energy Commission Siting Process

California law defines EJ as "the fair treatment of people of all races, cultures and income with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies" (Gov. Code, § 65040.12; Pub. Resources Code, §§ 71110-71118). All departments, boards, commissions, conservancies and special programs of the Resources Agency must consider EJ in their decision-making process if their actions have an impact on the environment, environmental laws, or policies. Such actions that require EJ consideration may include:

- Adopting regulations;
- Enforcing environmental laws or regulations;
- Making discretionary decisions or taking actions that affect the environment;
- Providing funding for activities affecting the environment; and

1 The 11 technical areas are, Air Quality, Cultural and Tribal Cultural Resources, Hazards Hazardous Materials and Wildfire, Water Resources, Land Use Agriculture and Forestry, Noise and Vibration, Public Health, Socioeconomics, Solid Waste Management, Transportation, and Visual Resources. Cultural and Tribal Cultural Resources considers impacts to Native American populations.

- Interacting with the public on environmental issues.

The California Natural Resources Agency recognizes that EJ communities are commonly identified as those where residents are predominantly minorities or live below the poverty level; where residents have been excluded from the environmental policy setting or decision-making process; where they are subject to a disproportionate impact from one or more environmental hazards; and where residents experience disparate implementation of environmental regulations, requirements, practices, and activities in their communities. Environmental justice efforts attempt to address the inequities of environmental protection in these communities.

An EJ analysis is composed of the following:

- Identification of areas potentially affected by various emissions or impacts from a proposed project;
- Providing notice in appropriate languages (when possible) of the proposed project and opportunities for participation in public meetings to EJ communities;
- A determination of whether there is a comparatively larger population of minority persons, or persons below the poverty level, living in an area potentially affected by the proposed project; and
- A determination of whether there may be a significant adverse impact on a population of minority persons or persons below the poverty level caused by the proposed project alone, or in combination with other existing and/or planned projects in the area.

CalEnviroScreen- More Information About an EJ Population

CalEnviroScreen is a science-based mapping tool used by CalEPA to identify disadvantaged communities[2] pursuant to Senate Bill (SB) 535. As required by SB 535, disadvantaged communities are identified based on geographic, socioeconomic, public health and environmental hazard criteria. CalEnviroScreen identifies impacted communities by taking into consideration pollution exposure and its effects, as well as health and socioeconomic status, at the census-tract level. (OEHHA 2021, p. 8)[3].

Using data from federal and state sources, the tool consists of four components in two broad groups. The Exposure and Environmental Effects components comprise a Pollution

2 The California Environmental Protection Agency, for purposes of its Cap-and-Trade Program, defines communities in terms of census tracts and identifies four types of geographic areas as disadvantaged: (1) census tracts receiving the highest 25 percent of overall scores in CalEnviroScreen 4.0; (2) census tracts lacking overall scores in CalEnviroScreen 4.0 due to data gaps, but receiving the highest 5 percent of CalEnviroScreen 4.0 cumulative pollution burden scores; (3) census tracts identified in the 2017 DAC designation as disadvantaged, regardless of their scores in CalEnviroScreen 4.0; (4) and areas under the control of federally recognized Tribes (CalEPA 2022a).

3 Note that CalEnviroScreen is not intended to substitute for a cumulative impact analysis under the California Environmental Quality Act (CEQA); restrict the authority of government agencies in permit and land use decisions; or guide all public policy.

Burden group, and the Sensitive Populations and Socioeconomic Factors components comprise a Population Characteristic Group. The four components are made up of environmental, health, and socioeconomic data from 21 indictors.

CalEnviroScreen scores presents a relative, rather than an absolute, evaluation of pollution burdens and vulnerabilities in California communities by providing a relative ranking of communities across the state (OEHHA 2021, p. 8). Calculating the CalEnviroScreen scores begins by assigning percentile scores to the 21 statewide indicators, which fall into two categories of Pollution Burden and Population Characteristics. The percentiles are averaged for the set of indicators in each of the four components (Exposures, Environmental Effects, Sensitive Populations, and Socioeconomic Factors). These four components in turn, are combined to yield an overall CalEnviroScreen score (Cal/EPA 2022a, p. 5-6). Each category has a maximum score of 10, and, thus, when multiplied the maximum CalEnviroScreen score is 100. Based on these scores, census tracts across California are ranked relative to one another. Values for the various components are shown as percentiles, which indicate the percent of all census tracts with a lower score. A higher percentile indicates a higher potential relative burden. A percentile does not describe the magnitude of the difference between two tracts, but rather it simply tells the percentage of tracts with lower values for that indicator (OEHHA 2021, p. 20).

Table 6-1 lists the indicators that go into the Pollution Burden score and the Population Characteristics score to form the final CalEnviroScreen score. These indicators are used to measure factors that affect the potential for pollution impacts in communities.

TABLE 6-1 COMPONENTS THAT FORM THE CALENVIROSCREEN 4.0 SCORE

Pollution Burden	
Exposure Indicators	**Environmental Effects Indicators**
Children's lead risk from housing	Cleanup sites
Diesel particulate matter (PM) emissions	Groundwater threats
Drinking water contaminants	Hazardous waste
Ozone concentrations	Impaired water bodies
PM 2.5 concentrations	Solid waste sites and facilities
Pesticide use	
Toxic releases from facilities	
Traffic density	
Population Characteristics	
Sensitive Populations Indicators	**Socioeconomic Factors Indicators**
Asthma emergency department visits	Educational attainment
Cardiovascular disease (emergency department visits for heart attacks)	Housing-burdened low-income households
Low birth-weight infants	Linguistic isolation
	Poverty
	Unemployment

Notes: PM = particulate matter. PM 2.5 = fine particulate matter 2.5 microns or less.
Source: OEHHA 2021

For the technical areas of Air Quality; Hazards, Hazardous Materials/Waste, and Wildfire; Public Health; Solid Waste Management; and Water Resources, CEC staff (staff) reviews the CaliEnviroScreen data for the project area as follows:

- For air quality, these indicators are; ozone concentrations and PM2.5 concentrations.
- For hazards, hazardous materials/waste, and wildfire, these indicators are; cleanup sites, and hazardous waste.
- For public health, these indicators are; asthma, cardiovascular disease, diesel PM emissions, low birth-weight infants, pesticide use, toxic releases from facilities, and traffic density.
- For solid waste management, this indicator is solid waste and facilities.
- For water resources, these indicators are; drinking water contaminants, groundwater threats, and impaired water bodies.

When these technical areas have identified a potential project impact where an EJ population is present, CalEnviroScreen is used to better understand the characteristics of the areas where the impact would occur and ensure that disadvantaged communities in the vicinity of the proposed project have not been missed when screened by race/ethnicity and low income.

Project Outreach

Environmental justice principles are described in California Government Code section 65040.12 and may be incorporated into local land use standards. Under this guidance, one principle of environmental justice is for government decisionmakers to engage in meaningful involvement with potentially impacted communities. Consistent with US EPA policy, meaningful involvement occurs when:

- those whose environment and/or health would be potentially affected by the decision on the proposed activity have an appropriate opportunity to participate in the decision;
- the population's contribution can influence the decision; and
- the concerns of all participants involved are considered in the decision-making process.

Furthermore, it is the policy of California Natural Resources Agency that the public, including minority and low-income populations, are informed of opportunities to participate in the development and implementation of all Resources Agency programs, policies and activities, and that they are not discriminated against, treated unfairly, or caused to experience disproportionately high and adverse human health or environmental effects from environmental decisions (CNRA 2023).

CEC staff and the Public Advisor's Office (PAO) coordinated closely on public outreach early in the review process. The PAO reached out to a wide array of local and regional entities including community-based organizations dedicated to environmental health,

social and environmental justice, air quality, education, and labor. Outreach also included environmental groups and government entities working in environmental protection, land management, resources, utilities, wildlife, and conservation, as well as various businesses, schools and legislative offices in the region.

CEC staff docketed and mailed to the project mail list a Notice of Receipt of the Morton Bay Geothermal Project Application on August 1, 2023. Based on current U.S. Census English fluency data for the population residing in the cities and communities within a six-mile radius of the project site, translation of the public notices was deemed appropriate. U.S. Census data also showed that of those who report they "speak English less than very well," the predominant language spoken was Spanish. Public notices for the project in both English and Spanish were published in local newspapers on August 4 and August 10, 2023, respectively.

In accordance with the Governor's Executive Order B-10-11, the CEC's Tribal Consultation Policy, the CEC's Siting Regulations, and the California Environmental Quality Act (CEQA)), staff conducted outreach and consultation with regional tribal governments. Additional information regarding the outreach efforts and specific groups contacted can be found in **Section 5.3 Cultural and Tribal Cultural Resources**.

As described in **Section 2, Introduction**, staff mailed the notification of the Staff Assessment to all owners and occupants of properties within 1,000 feet of power plant site and 500 feet of project linears.

Environmental Justice Project Screening

Figure 6-1 shows 2020 census blocks in a six-mile radius of the project with a minority population greater than or equal to 50 percent (U.S. Census 2020). The population in these census blocks represents an EJ population based on race and ethnicity as defined in the U.S. EPA's *Guidance on Considering Environmental Justice During the Development of Regulatory Actions* (U.S. EPA 2015).

Based on California Department of Education data in **Table 6-2** and presented in **Figure 6-2**, staff concludes that the percentage of those living in the Calipatria Unified School District (in a six-mile radius of the project site) and enrolled in the free or reduced-price meal program is larger than the percentage of those living in the reference geography (Imperial County) and enrolled in these programs. Thus, the population in this school district is considered an EJ population based on low income as defined in *Guidance on Considering Environmental Justice During the Development of Regulatory Actions*.

TABLE 6-2 LOW INCOME DATA WITHIN THE PROJECT AREA			
School District in a Six-Mile Radius of the Project Site	**Enrollment Used for Meals**	**Free or Reduced-Price Meals**	
Calipatria Unified	**1,086**	**958**	**88.2%**
Reference Geography			
Imperial County	35,975	27,297	75.9%

Note: **Bold** indicates school districts considered having an EJ population based on low income
Source: CDE 2024

Figure 6-1
Minority Population and Disadvantaged Communities

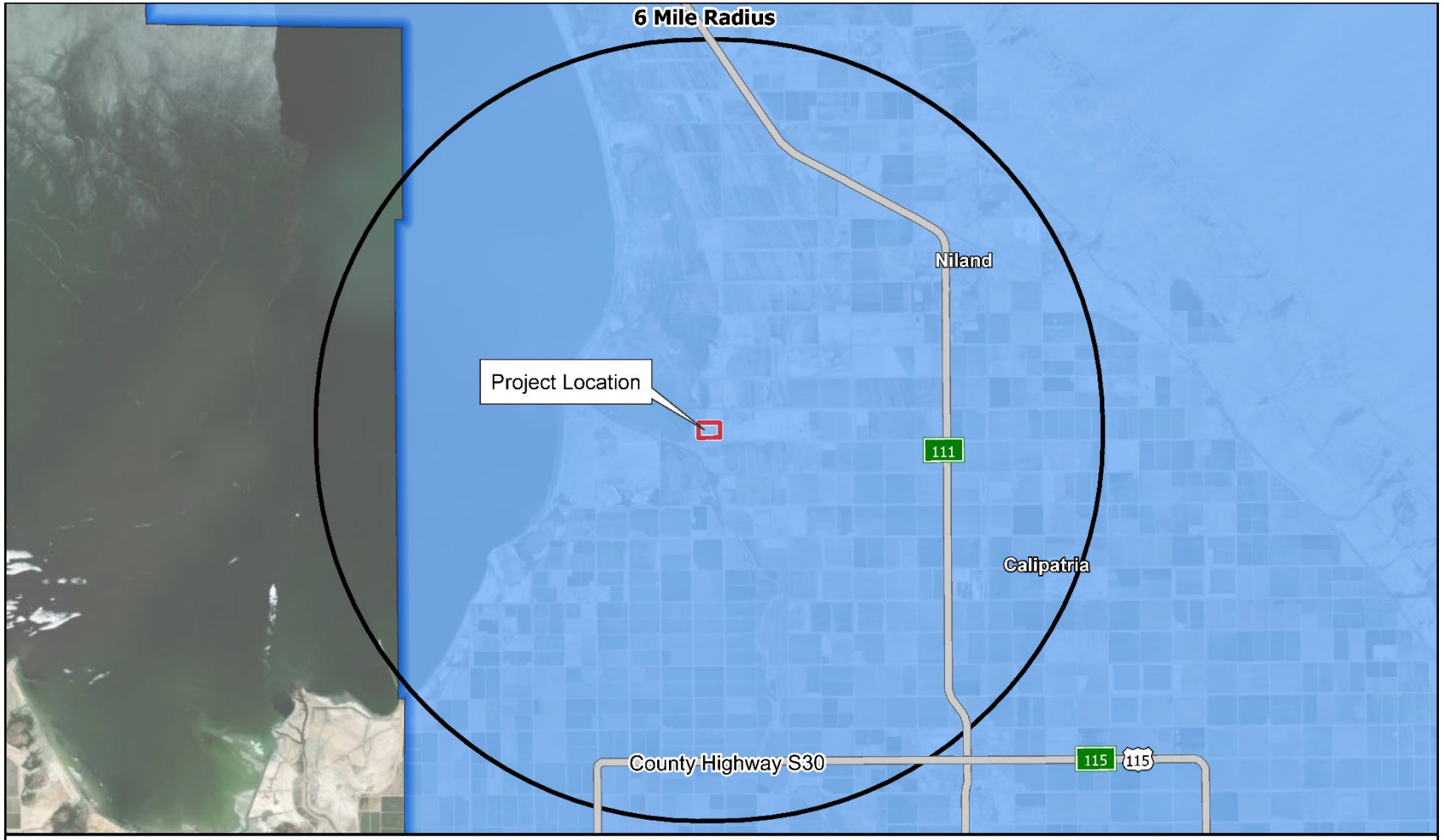

Figure 6-2
Low Income Population

Table 6-3 presents the CalEnviroScreen overall scores and disadvantaged communities[4] (DAC) type for the DACs in a six-mile radius of the project site. The location of each of these census tracts is shown on **Figure 6-1**. Staff used CalEnviroScreen to identify DACs in the vicinity of the proposed project and better understand the characteristics of the areas where impacts could occur.

TABLE 6-3 CALENVIROSCREEN SCORES FOR DISADVANTAGED COMMUNITIES

Census Tract No.	Total Population	CES 4.0 Percentile	Pollution Burden Percentile	Population Characteristics Percentile	DAC Category
06025010102	4,108	81.69	63.14	86.28	CES 4.0 Top 25%
06025010200	2,728	88.84	61.31	97.47	CES 4.0 Top 25%

Note: Disadvantaged communities by census tract in the project's six-mile radius. Source: CalEPA 2022b

The CalEnviroSceen indicators are used to measure factor that affect the potential[5] for pollution impacts in communities. **Table 6-4** presents the CalEnviroScreen percentiles for the indicators that make up the pollution burden percentile within six-mile radius of the project site. **Table 6-5** presents the percentiles for the indicators that make up the population characteristics.

4 The CalEPA, for purposes of its Cap-and-Trade Program, defines communities in terms of census tracts and identifies four types of geographic areas as disadvantaged: (1) census tracts receiving the highest 25 percent of overall scores in CalEnviroScreen 4.0; census tracts lacking overall scores in CalEnviroScreen 4.0 due to data gaps, but receiving the highest 5 percent of CalEnviroScreen 4.0 cumulative pollution burden scores; (3) census tracts identified in the 2017 DAC designation, regardless of their scores in CalEnviroScreen 4.0; (4) and areas under control of federally recognized Tribes (CalEPA 2022a)

5 It is important to note that CalEnviroScreen is not an expression of health risk and does not provide quantitative information on increases of impacts for specific sites or project. CalEnviroScreen uses the criteria of "proximity" to a hazardous waste site, a leaking underground tank, contaminated soil, an emission stack (industry, power plant, etc.) to determine that a population is "impacted". It does not address general principles of toxicology: dose/response and exposure pathways. For certain toxic chemicals to pose a risk to the public, offsite mitigation pathways must exist (through ingestion, inhalation, dermal contact, etc.) and contact to a certain amount – not just any amount – must exist.

TABLE 6-4 CALENVIROSCREEN INDICATOR PERCENTILES FOR POLLUTION BURDEN FOR DISADVANTAGED COMMUNITIES

Census Tract No.	Percentiles													
	Pollution Burden	Ozone	PM2.5	Diesel PM	Drinking Water	Lead	Pesticides	Toxic Release	Traffic	Cleanup Sites	Groundwater Threats	Hazardous Waste	Impaired Water Bodies	Solid Waste
06025010102	63.14	11.60	19.09	9.09	30.61	50.80	90.52	7.58	3.06	74.19	77.93	93.25	99.96	86.51
06025010200	61.31	24.92	32.40	11.55	55.55	66.20	92.93	7.06	12.61	0.00	54.52	90.30	99.96	75.67

Note: Disadvantaged communities by census tract in the project's 6-mile radius. Source: CalEPA 2022b

TABLE 6-5 CALENVIROSCREEN INDICATOR PERCENTILES FOR POPULATION CHARACTERISTICS FOR DISADVANTAGED COMMUNITIES

Census Tract No.	Percentiles								
	Population Characteristics	Asthma	Low Birth Weight	Cardiovascular Disease	Education	Linguistic Isolation	Poverty	Unemployment	Housing Burden
06025010102	86.28	87.62	26.87	83.15	82.70	88.83	94.90	99.32	51.36
06025010200	97.47	99.25	82.91	91.65	83.23	75.53	88.81	96.97	62.42

Note: Disadvantaged communities by census tract in the project's 6-mile radius. Source: CalEPA 2022b

6.2 Environmental Impacts

The following technical areas discuss impacts to EJ populations: Air Quality; Cultural and Tribal Cultural Resources; Hazards, Hazardous Materials/Waste, and Wildfire; Land Use, Agriculture, and Forestry; Noise and Vibration; Public Health; Socioeconomics; Solid Waste Management; Transportation; Visual Resources; and Water Resources. As noted on page 6-4, the five technical areas that could have project impacts that could overlap with the indicators in CalEnviroScreen: Air Quality; Hazards, Hazardous Materials/Waste, and Wildfire; Public Health; Solid Waste Management; and Water Resources.Air Quality; Hazards, Hazardous Materials, and Wildfire; Public Health; Solid Waste Management; and Water Resources.

Air Quality

Less Than Significant with Mitigation Incorporated. **Table 6-4** and **Table 6-5** include indicators that relate to air quality. The indicators that are associated with criteria pollutants such as ozone and fine particulate matter having a diameter of less than or equal to 2.5 microns (PM2.5) are indicators related to air quality. Each of these air quality indicators are summarized under this Air Quality subsection.

Ambient air quality standards (AAQS) are established to protect the health of even the most sensitive individuals in our communities, which includes the EJ population, by defining the maximum amount of a pollutant that can be present in outdoor air without harm to the public's health. Both the California Air Resources Board and the U.S. EPA are authorized to set ambient air quality standards. Since toxic air contaminants (TACs) have no AAQS that specify health-based levels considered safe for everyone, a health risk assessment (HRA) is used to determine if people might be exposed to those types of air pollutants at unhealthy levels.

Staff identified the potential air quality (i.e., ozone and PM2.5) and public health impacts (i.e., cancer and non-cancer health effects) that could affect the EJ population represented in **Figures 6-1** and **6-2**. These potential air quality impact and public health risks were evaluated quantitatively based on the most sensitive population, which includes the EJ population, by conducting an air quality impact analysis (AQIA) and an HRA. Please refer to **Section 5.1 Air Quality** and **Section 5.10 Public Health** for details. Staff also examined individual contributions of indicators in CalEnviroScreen that are relevant to air quality (see **Table 6-1**).

In **Section 5.1 Air Quality** and **Section 5.10 Public Health**, staff concluded that with the implementation of Air Quality and Public Health conditions of certification (COCs), criteria pollutant emissions would not cause or contribute to exceedances of health-based ambient standards and the project's toxic air emissions would not exceed health risk limits. Likewise, with the implementation of Air Quality and Public Health COCs, the project would not cause disproportionate air quality or public health impacts on sensitive populations, such as the EJ population represented in **Figures 6-1** and **6-2**.

Ozone Impacts. Ozone is known to cause numerous health effects, which can potentially affect EJ communities as follows:

- Lung irritation, inflammation and exacerbation of existing chronic conditions, even at low exposures (Alexis et al. 2010, Fann et al. 2012, Zanobetti and Schwartz 2011);
- Increased risk of asthma among children under 2 years of age, young males, and African American children (Lin et al., 2008, Burnett et al., 2001); and,
- Higher mortality, particularly in the elderly, women, and African Americans (Medina-Ramon and Schwartz, 2008).

Even though ozone is not directly emitted from emission sources of the project, precursor pollutants that create ozone, such as nitrogen oxides (NOx) and volatile organic compounds (VOCs), would be emitted. The NOx and VOC emissions of the project during operation would not exceed the threshold of 137 pounds per day. Therefore, the project would not be required to offset these emissions. In addition, secondary formation of ozone from the project's NOx and VOC emissions are modeled to be well below the significant impact levels. Therefore, secondary impacts of ozone would be less than significant. Please see more detailed discussion in **Section 5.1 Air Quality**.

For CalEnviroScreen, the air monitoring data used in this indicator have been updated to reflect ozone measurements for the years 2017 to 2019. CalEnviroScreen 4.0 uses the average daily maximum 8-hour ozone concentration (parts per million). According to CalEnviroScreen data, ozone concentrations in each census tract are ordered by ozone concentration values, and then are assigned a percentile based on the statewide distribution of values.

Results for ozone are shown in **Table 6-4**. This means ozone levels in the three census tracts are relatively low, with percentiles less than 25. Another way to look at the data is that more than 75 percent of all California census tracts have higher ozone levels than these census tracts near the project. For ozone, the census tracts within a six-mile radius of the proposed project's site are not exposed to high ozone concentrations compared to the rest of the state.

The project would not be expected to contribute significantly to the regional air quality as it relates to ozone. As discussed above, the project would not be required to offset ozone precursor (NOx and VOCs) emissions because they would be below the threshold of 137 pounds per dayand secondary impacts of ozone would be less than significant. In addition, as required by **AQ-SC5**, the project would control diesel construction-related emissions during construction, which would reduce NOx and VOCs during construction. Therefore, the project would not contribute significantly to regional ozone concentrations, relative to baseline conditions. The project's air quality impacts, as it related to ozone and ozone precursors would be less than significant for the census tracts of concern and the general population.

Staff concludes that the project would not expose sensitive receptors to substantial ozone and ozone precursor concentrations. The project's ozone and ozone precursor air quality impacts would be less than significant for the local EJ community and the general population. Additionally, the project would not result in a cumulatively considerable net increase of secondary pollutants such as ozone in the air basin.

PM2.5 Impacts. Particulate matter (PM) is a complex mixture of aerosolized solid and liquid particles including such substances as organic chemicals, dust, allergens and metals. These particles can come from many sources, including cars and trucks, industrial processes, wood burning, or other activities involving combustion. The composition of PM depends on the local and regional sources, time of year, location, and weather.

PM2.5 refers to particles that have a diameter less than or equal to 2.5 micrometers. PM2.5 is known to cause numerous health effects, which can potentially affect EJ communities. Particles in this size range can have adverse effects on the heart and lungs, including lung irritation, exacerbation of existing respiratory disease, and cardiovascular effects.

For CalEnviroScreen, the indicator PM2.5 is determined by the annual mean concentration of PM2.5 (weighted average of measured monitor concentrations and satellite observations, $\mu g/m^3$), averaged over three years (2015-2017). According to CalEnviroScreen data, PM2.5 concentrations in each census tract are ordered by PM2.5 concentration values, and then are assigned a percentile based on the statewide distribution of values and are shown in **Table 6-4**.

Census tract 06025010200 was at the 32.4 percentile in the PM2.5 category (see **Table 6-4**). This indicates that particulate matter concentrations in this census tract are higher than 32.4 percent of tracts statewide. This indicates that these communities are exposed to below average PM2.5 concentrations compared to the rest of the state. Census tract 06025010102 was at the 19.09 percentile in the PM2.5 category, which indicates the communities within the census tract are exposed to lower PM2.5 concentrations than those in the census tract 06025010200.

The project would be expected to comply with ambient air quality standards for PM2.5 during construction and operations. The project would be required to comply with **AQ-SC1** through **AQ-SC5** during construction, which would reduce particulate matter during construction. The project would therefore be expected to not contribute significantly to regional PM2.5 concentrations, relative to baseline conditions. The project's air quality impacts, as it related to PM2.5 would be less than significant for the census tract of concern and the general population.

Staff concludes that the project would not expose sensitive receptors to substantial PM2.5 concentrations.

Cultural and Tribal Cultural Resources

No Impact. Staff did not identify any Native American environmental justice populations that either reside within six miles of the project or that rely on any subsistence resources that could be impacted by the proposed project.

Hazards, Hazardous Materials/Waste, and Wildfire

Less Than Significant Impact with Mitigation Incorporated. EJ populations may experience disproportionate hazards, hazardous materials/waste, and wildfire impacts if the storage and use of hazardous materials within or near EJ communities occur to a greater extent than within the community at large, or if the project would contribute to or exacerbate the effects of cleanup sites and hazardous waste generators and facilities. A disproportionate impact upon the EJ population can also result from the planned storage and use of hazardous materials on the site. The project would be required to complete a Hazardous Materials Business Plan (HMBP) that would list the hazardous materials on site and their location per **HAZ-1**. Before any new hazardous material could be brought on site, it would have to be reviewed and approved by the Compliance Project Manager per **HAZ-2**, which would ensure that any new hazardous material would be stored per the applicable laws, ordinances, regulations, and standards (LORS). The project would be required to submit a Spill Prevention Control and Countermeasure (SPCC) plan due to large quantities of turbine and mineral oil on site, which would lay out the proper procedures to help prevent a release per **HAZ-1**. The project would also have to establish safety management plans for the delivery of each bulk chemical per **HAZ-3**. The safety management plans would include the required personal protective equipment, a comprehensive loading and unloading checklist, and requirements to ensure the proper bulk chemical is being unloaded. Therefore, the likelihood of a spill or release of sufficient quantity to impact the surrounding community and EJ population would be very unlikely and considered less than significant with mitigation incorporated.

A disproportionate waste management impact on an EJ population could occur if project wastes impacted the disadvantaged community. Additionally, since the overall CalEnviroScreen score reflects the collective impacts of multiple pollutants and factors, staff examined the individual contributions to indicators as they relate to hazardous wastes addressed in **Section 5.7 Hazards, Hazardous Materials/Waste, and Wildfire**. The wastes of concern in this analysis are those from construction and operational activities. The handling and disposal of each type of waste depends on the hazardous ranking of its constituent materials. Existing LORS ensure the desired handling and disposal of waste materials to prevent potential public or environmental health impacts. The CalEnviroScreen scores for the disadvantaged community census tracts in a six-mile radius of the project (see **Figure 6-1**) are presented in **Table 6-4** for each of the following environmental stressors that relate to waste management: cleanup sites and hazardous waste generators and facilities. The percentile for each disadvantaged census tract reflects its relative ranking among all of California's census tracts.

CalEnviroScreen assigns a score to each indicator of stressors. To assess the impact of a stressor on the population within a census tract, the score is assigned a weighting factor that decreases with distance from the census tract. For stationery stressors, the weighting factor diminishes to zero for distances larger than 1,000 meters (0.6 mile). As **Figure 6-1** shows, all but one of the assessed census tracts are more than 1,000 meters away from the project. The only tract that is within 1,000 meters of the proposed project site is tract 06025010102—the tract in which the project would be located. Therefore, this analysis focuses on that tract.

Cleanup Sites. This indicator is calculated by considering the number of cleanup sites including Superfund sites on the National Priorities List (NPL), the weight of each site, and the distance to the census tract. Sites undergoing cleanup actions by governmental authorities, or by property owners, have suffered environmental degradation due to the presence of hazardous substances. Of primary concern is the potential for people to come in contact with these substances.

The percentile score in the cleanup sites indicator for the only census tract within 1,000 meters of the project site (tract 06025010102) is 74.19 (see **Table 6-4**). The interpretation is that contamination threats due to the presence of cleanup sites in this census tract are among the highest of all tracts statewide. This is an indication that the communities within that tract are located alongside a relatively high proportion of cleanup sites.

If there is any existing or unknown contamination at the project site, it would be remediated by the project owner in accordance with **HAZ-7**, **HAZ-8**, and **HAZ-9** that would ensure there would be no impacts to on- or off-site receptors. In addition, the project owner would have to comply with appropriate LORS that would require additional cleanup of contaminated soils and groundwater that might be encountered during construction and operation activities. Therefore, the project would not contribute significantly to the effects from cleanup sites for the relevant census tract and for the general population.

Hazardous Waste Generators and Facilities. This indicator is calculated by considering the number of permitted treatment, storage, and disposal facilities (TSDFs) or generators of hazardous waste, the weighting factor of each generator or site, and the distance to the census tract. Most hazardous waste must be transported from hazardous waste generators to permitted TSDFs by registered hazardous waste transporters. Most shipments must be accompanied by a hazardous waste manifest. There are widespread concerns for both human health and the environment from sites that serve for the processing and disposal of hazardous waste. Newer facilities are designed to prevent the contamination of air, water, and soil with hazardous material. However, even newer facilities may negatively affect perceptions of surrounding areas in ways that have economic, social, and health impacts.

The percentile score in the hazardous waste generators and facilities indicator for the only census tract within 1,000 meters of the project site (tract 06025010102) is 93.25 (see **Table 6-4**). The interpretation is that this census tract is among the worst of all tracts statewide in terms of threats related to hazardous waste generation and facilities, meaning that the communities in that tract are located alongside sites with a high relative proportion of hazardous waste generators and facilities.

The project would not contribute significantly to hazardous waste generation or to the number or size of facilities handling hazardous waste processing. Further, the project would be required to comply with appropriate LORS to control storage and disposal of hazardous waste during its construction and operation phases. The project would implement modern operational phase controls to prevent or reduce the generation of hazardous wastes and to dispose of them in a manner that would minimize impacts to the environment both during project construction and operation. The project's impacts related to hazardous waste generation and disposal would be reduced to less than significant for the relevant census tract and the general population.

Land Use, Agriculture, and Forestry

Less Than Significant Impact. The proposed project is consistent with the allowed uses and development standards for the applicable zoning districts, and the project would not involve uses that could cause unmitigated hazardous or nuisance impacts. (**Section 5.1 Air Quality**, **Section 5.7 Hazards, Hazardous Materials/Waste**, **and Wildfire**, **Section 5.9 Noise and Vibration**, **Section 5.10 Public Health**, **and Section 5.14 Transportation** of this document evaluate the project's potential impacts relating to nuisance effects and hazards.) The project would not conflict with land use plans or policies such that significant environmental impacts would occur. Although the conversion of Important Farmland would be a significant impact without mitigation, it is not the type of impact that typically disproportionately affects EJ populations in the area. Land Use, Agriculture, and Forestry impacts from the project would be less than significant with mitigation, including potential disproportionate impacts on an EJ population.

Noise and Vibration

Less Than Significant Impact. EJ populations may experience disproportionate noise impacts if the siting of unmitigated industrial facilities occurs within or near EJ communities to a greater extent than within the community at large. The project site is within an area having an EJ population. The area surrounding the site is primarily industrial uses. The nearest residence is located over three and a half miles from the center of the project site.

Construction activities would increase existing noise levels at the adjacent land uses, but they would be temporary and intermittent. In addition, the County's General Plan Noise Element establishes a noise level threshold for a single piece or combination of construction equipment—noise levels from the equipment shall not exceed 75 dBA Leq averaged over and eight-hour period at the nearest sensitive receptor. Additionally,

construction equipment operations would be limited to the hours of 7:00 A.M. to 7:00 P.M., Mondays through Fridays, and 9:00 A.M. to 6:00 P.M., Saturdays. Commercial construction operations are not permitted on Sundays or holidays. While construction of the proposed project would temporarily increase noise levels in the immediate neighboring areas of the project site, since there are no noise-sensitive land uses in the immediate vicinity of the project site, construction activities would result in a less than significant noise impact for the EJ community.

Sources of operational noise for the project would include the steam turbine generator, mechanical equipment including cooling towers and other equipment necessary for project operation. The County's General Plan Noise Element includes goals to minimize the effects of operational noise impacts from new industrial development on sensitive land uses. Since the project is not adjacent to, or in close proximity of a residential land use, no noise reduction measures would be required and operation of the project would have a less than significant impact for all the area's population, including the EJ population.

Public Health

Less Than Significant with Mitigation Incorporated. **Table 6-4** and **Table 6-5** include indicators that relate to public health. Indicators that are associated with protecting public health are: diesel particulate matter (DPM), pesticide use, toxic release from facilities, traffic density, asthma ER visits, low birth weight infants, and cardiovascular disease. Each of these public health indicators are summarized below.

DPM. This indicator represents how much diesel PM is emitted into the air within and near the census tract. The data are from 2016 California Air Resources Board's emission data from on-road vehicles (trucks and buses) and off-road sources (ships and trains, for example). This is the most recent data available with which to make the necessary comparisons.

Table 6-4 shows that census tracts 06025010102 and 06025010200 are at the 9.09 and 11.55 percentile in the DPM category. This indicates that the background concentration of DPM in these census tracts is below the statewide average and these communities are not exposed to high level DPM as compared to the rest of the state. Also, according to the results of the health risk assessment (HRA) conducted for this project in **Section 5.10 Public Health**, impacts associated with diesel PM from the proposed project construction and operation activities (diesel-fueled equipment) would be less than significant and would not have a significant cumulative contribution to the DPM levels in the disadvantaged communities.

Pesticide Use. Specific pesticides included in the Pesticide Use category were narrowed from the list of all registered pesticides in use in California to focus on a subset of 132 active pesticide ingredients that are filtered for hazard and volatility for the years 2017-2019 collected by the California Department of Pesticide Regulation. Only pesticides used on agricultural commodities are included in the indicator.

Table 6-4 shows that census tracts 06025010102 and 06025010200 are higher than the 90th percentile (i.e. 90.52 and 92.93) in the Pesticide Use category. This indicates that pesticide use in these census tracts are higher than the statewide average and these communities are exposed to high pesticide concentrations as compared to the rest of the state. Please note that this indicator only presents potential exposure, not actual exposure to pesticides.

Census tract 06025010102 has an estimated 1,275.86 pounds of active ingredients used per square mile. The percentile for this census tract is 90.52, meaning it is higher than 90.52 percent of the census tracts in California. The selected pesticides with highest use in this tract are: (1) 1,3-dichloropropene, (2) trifluralin, (3) chloropicrin, (40) chlorthal-dimethyl, and (5) methomyl. However, according to the results of the HRA conducted for this project in **Section 5.10 Public Health**, impacts associated with toxic air contaminants (TACs) from the proposed project construction and operation activities would be less than significant with mitigation incorporated and therefore would not have a significant cumulative contribution on these disadvantage communities with existent potential burden on pesticides.

Census tract 06025010200 has an estimated 2,030.99 pounds of active ingredients used per square mile. The percentile for this census tract is 92.93, meaning it is higher than 92.93 percent of the census tracts in California. The selected pesticides with highest use in this tract are: (1) 1,3-dichloropropene, (2) eptc, (3) chlorthal-dimethyl, (4) trifluralin, and (5) methomyl. However, since this census tract is six miles away from the proposed project site, the toxic air emitted from the project would not have cumulative impact on these disadvantage communities with existent potential burden on pesticides.

Toxic Releases from Facilities. This indicator represents modeled toxicity-weighted concentrations of chemical releases to air from facility emissions and off-site incineration in and near the census tract. The U.S. EPA provides public information on the amount of chemicals released into the environment from many facilities. This indicator uses the modeled air concentration and toxicity of the chemical to determine the toxic release score. The data is averaged over 2017 to 2019.

Table 6-4 shows that census tracts 06025010102 and 06025010200 are at the 7.58 and 7.06 percentile in the Toxic Release category. This indicates that toxic release from facilities threats in these census tracts is below the statewide average and these communities are lower than the state average for exposure to toxic releases. Also, according to the results of the HRA conducted for this project in **Section 5.10 Public Health**, impacts associated with TACs from the proposed project construction and

operation activities would be less than significant with mitigation incorporated and therefore would not have a significant cumulative contribution to toxic releases in the disadvantaged communities.

Traffic Impacts. This indicator represents the average traffic volumes per amount of roadways. It is calculated by dividing the traffic volumes by the total road length within and 150 meters around the census tract. The data is from 2017. Traffic impacts are related to the diesel PM emitted from diesel-fueled vehicles.

Table 6-4 shows that census tracts 06025010102 and 06025010200 are at the 3.06 and 12.61 percentile in the Traffic Impacts category. This indicates that average traffic volumes per amount of roadways in these census tracts are below the statewide average and these communities are lower than the state average for traffic impacts. Also, according to the results of the HRA conducted for this project in **Section 5.10 Public Health**, impacts associated with diesel PM from the proposed project construction and operation activities (diesel-fueled equipment) would be less than significant and would not have a significant cumulative contribution to the diesel PM-related traffic density in the disadvantaged communities.

The proposed project would generate a small number of vehicle trips to the site. These trips include workers, material, and equipment deliveries. It is unlikely that the addition of vehicle trips from the project would result in a significant contribution to the traffic density on any roadway in the vicinity of the project site. The project's traffic volume impact would not have a significant cumulative contribution to the traffic density for the local EJ community and the general population.

Asthma. This indicator is a representation of an asthma rate. It measures the number of emergency department (ED) visits for asthma per 10,000 people over the years 2015 to 2017. The information was collected by the California Office of Statewide Health Planning and Development (OSHPD).

Table 6-5 shows that census tract 06025010200 is higher than the 90th percentile (i.e. 99.25) in the Asthma category. Census tract 06085503712 is slightly lower, at the 87.62 percentile. This indicates that these two communities have above average numbers of ED visits due to asthma compared to the rest of the state.

In census tract 06025010200, an estimated 157 people per 10,000 people in this census tract visited the emergency department for asthma. The asthma percentile for this census tract is 99.25, meaning the asthma rate is higher than 99.25 percent of the census tracts in California. In census tract 06085503712, an estimated 85 people per 10,000 people in this census tract visited the emergency department for asthma. The asthma percentile for this census tract is 88, meaning the asthma rate is higher than 88 percent of the census tracts in California.

According to the results of the health risk assessment conducted for the project in **Section 5.10 Public Health**, impacts associated with TACs from the proposed project construction and operation activities would be less than significant with mitigation incorporated and therefore would not have a significant cumulative contribution to asthma ED visits. The project's emissions would not have a significant cumulative contribution to asthma ED visits for the local EJ community and the general population.

Low Birth Weight Infants. This indicator measures the percentage of babies born weighing less than 2500 grams (about 5.5 pounds) out of the total number of live births over the years 2009 to 2015. The information was collected by the California Department of Public Health (CDPH).

Table 6-5 shows that census tract 06025010200 is at the 82.91 percentile in the Low Birth Weight category. Census tract 06085503712 is at the 26.87 percentile. This indicates that the communities of census tract 0602501020 has lower birth weight compared to the rest of the state.

In census tract 06025010200, 6.45 percent of births in this census tract were low birth weight. The low birth weight percentile for this census tract is 82.91, meaning the percent low birth weight is higher than 82.91 percent of the census tracts in California.

Staff's HRA in **Section 5.10 Public Health** for the proposed project was based on a highly conservative health-protective methodology that accounts for impacts on the most sensitive individuals in a given population. According to the results of the assessment, the risks at the nearest sensitive receptors (i.e., Maximally Exposed Sensitive Receptor and Maximally Exposed Individual Resident [MEIR]) are below health-based thresholds. Therefore, the toxic emissions from the project would not cause significant health effects for the low birth-weight infants in these disadvantaged communities or have a significant cumulative contribution to these disadvantaged communities.

Cardiovascular Disease. This indicator represents the rate of heart attacks. It measures the number of emergency department (ED) visits for acute myocardial infarction (AMI) (or heart attack) per 10,000 people over the years 2015 to 2017.

Table 6-5 shows that census tract 06025010200 is higher than the 90th percentile (i.e. 91.65) in the cardiovascular disease category. Census tract 06085503712 is slightly lower, at the 83.15 percentile. This indicates that these community are above the average number of emergency department visits for AMI compared to the rest of the state.

In census tract 06025010200, an estimated 21.26 people per 10,000 visited the emergency department for a heart attack. The cardiovascular disease percentile for this census tract is 91.65, meaning it is higher than 91.65 percent of the census tracts in California. In census tract 06085503712, an estimated 18.64 people per 10,000 visited the emergency department for a heart attack. The cardiovascular disease percentile for

this census tract is 83.15, meaning it is higher than 83.15 percent of the census tracts in California.

According to the results of the HRA conducted for the project in **Section 5.10 Public Health**, impacts associated with TACs from the proposed project construction and operation activities would be less than significant with mitigation incorporated and therefore would not have a significant cumulative contribution to cardiovascular disease. The project's emissions would not have a significant cumulative contribution to cardiovascular disease for the local EJ community and the general population.

Socioeconomics

Less Than Significant Impact. The study area used to analyze the population influx and housing supply includes the city of Calipatria, and unincorporated Imperial County. Staff considered the project's socioeconomic impacts on the EJ population living in these geographic areas.

The potential for socioeconomic impacts is predominantly driven by the temporary influx of non-local construction workers seeking lodging closer to a project site. The project's socioeconomic impact could disproportionately affect an EJ population if the influx of non-local workers were to displace minority or low-income residents from where they live, causing them to find housing elsewhere. For the project, construction workers would be drawn from Imperial County or the San Diego metropolitan area. Approximately 20 percent of the construction workers would be non-local and may temporarily relocate closer to the project site. The project would include a construction camp for construction workers to temporarily relocate closer to the project site. In addition, there are nearby hotels and motels and RV parks and campgrounds. The operations workers are anticipated to be drawn from Imperial County. If some operations workers were to relocate closer to the project site, there would be sufficient housing in the project area As the project would not displace any residents or remove any housing, there would be no disproportionate impact to EJ populations from this project.

Solid Waste Management

Less Than Significant Impact. A disproportionate solid waste impact on an EJ population could occur if the project would contribute to or exacerbate the effects of local solid waste disposal facilities. Since the overall CalEnviroScreen score reflects the collective impacts of multiple pollutants and factors, staff examined the individual contributions to indicators as they relate to wastes addressed under utilities and system services. The wastes of concern in this analysis are those from construction and operational activities. The handling and disposal of each type of waste is dependent on the hazardous ranking of its constituent materials.

Existing laws, ordinances, regulations, and standards ensure the desired handling and disposal of waste materials without potential public or environmental health impacts. The CalEnviroScreen scores for the disadvantaged community census tracts in a six-mile

radius of the project (see **Figure 6-1**) are presented in **Table 6-1** for each of the following environmental stressors that relate to solid waste facilities. The percentile for each disadvantaged census tract reflects its relative ranking among all of California's census tracts. A disproportionate solid waste management impact on an EJ population could occur if project wastes impacted the disadvantaged community. CalEnviroScreen assigns a score to each category of stressors.

To assess the impact of a stressor on the population within a census tract, the score is assigned a weighting factor that's inversely proportional to the distance from the census tract. As **Figure 6-1** shows, two census tracts are located within the 6-mile radius; 06025010102 and 06025010101. However, the project site is within census tract 06025010102, and therefore this analysis focuses on that census tract.

Solid Waste Facilities. This indicator is calculated by considering the number of solid waste facilities including illegal sites, the weighting factor of each, and the distance to a census tract. Newer solid waste landfills are designed to prevent the contamination of air, water, and soil with hazardous materials. However, older sites that are out of compliance with current standards or illegal solid waste sites may degrade environmental conditions in the surrounding area and pose a risk of exposure. Other types of facilities, such as composting, treatment, and recycling facilities may raise concerns about odors, vermin, and increased traffic.

Census tract 06025010102 scored in the 86.5 percentile for the Solid Waste Facilities category (see **Table 6-4**). This indicates that the number and type of facilities within or nearby this census tract and the environmental deterioration due to their presence are among the highest of tracts statewide.

Solid waste generated during the construction and operation of the project would be segregated, where practical, for recycling, and would be disposed of where there is adequate capacity for non-hazardous waste. Also, the project would be required to develop and implement plans that would ensure proper disposal of nonhazardous waste at appropriately licensed facilities. The project owner would use solid waste sites or facilities that are verified to be in compliance with current laws, ordinances, regulations, and standards. In addition, there would be no increase in solid waste generators and facilities in the area due to project construction or operation because there is adequate capacity to dispose of waste from the project. Therefore, there would be no significant impact related to solid waste facilities that would disproportionately impact an EJ community in the relevant census tract.

Transportation

Less Than Significant Impact. Generally, reductions in transportation options may significantly impact EJ populations. In particular, an impact to bus transit, pedestrian facilities, or bicycle facilities could cause disproportionate impacts to low-income communities, as low-income residents more often use these modes of transportation. As concluded in **Section 5.14 Transportation**, all transportation impacts, including

impacts to alternative modes of transportation, would be less than significant and therefore would cause less than significant impacts to EJ populations. Likewise, transportation impacts would not be disproportionate.

Visual Resources

Less Than Significant Impact. A disproportionate impact pertaining to Aesthetics/Visual Resources to an EJ population may occur if a project is in proximity to an EJ population and the following:

- The project, if in an "urbanized area" per Public Resources Code section 21071 conflicts with applicable zoning and other regulations governing scenic quality.
- The project, if in a non-urbanized area, substantially degrades the existing visual character or quality of the public view of the site and its surroundings.
- The project creates a new source of substantial light and glare that would adversely affect day or nighttime views in the area.

Public Resources Code § 21071 defines "urbanized area." Following Public Resources Code § 21071, the proposed project was determined to be in a non-urbanized area. According with section 21071, and as discussed in section 5.15 Visual Resources the project would not significantly degrade the existing visual character or quality of public views of the site and its surroundings.

Staff viewed current aerial and street imagery (Google Earth, Google Maps), other maps, and site photographs in addition to the EJ figures in the EJ section and concluded the nearest EJ population would have a low visibility of the project due to the existence of aboveground landscape components (buildings, structures, earthworks, trees, etc.) obstructing or obscuring the public view of the project, topography, and the distance from an identified EJ population.

The project design includes shielding, directional light, non-reflectance materials, and other light pollution and reflectance facility design measures. Project components would have a low reflectance offsite.

The project would not have a disproportionate effect to an EJ population and would have a less than significant effect.

Water Resources

Less Than Significant Impact. A disproportionate water resources impact on an EJ population could occur if the project would contribute to drinking water degradation, exacerbate groundwater contamination, or discharge additional pollutants to impaired surface water bodies. Since the overall CalEnviroScreen score reflects the collective impacts of multiple pollutants and factors, staff examined the individual contributions to indicators as they relate to water resources. The pollutants of concern in this analysis are those from construction and operation activities. The CalEnviroScreen scores for the

disadvantaged community census tracts in a six-mile radius of the project (see **Figure 6-1**) are presented in **Table 6-4** for each of the following environmental stressors that relate to water resources: Drinking Water Contaminants, Groundwater Threat, and Impaired Water Bodies. The percentile for each disadvantaged census tract reflects its relative ranking among all of California's census tracts.

CalEnviroScreen 4.0 assigns a score to each type of stressor. To assess the impact of a stressor on population within a census tract, the score is assigned a weighting factor that decreases with distance from the census tract. For stationary stressors related to water resources, the weighting factor diminishes to zero for distances larger than 1,000 meters (0.6 mile). As **Figure 6-1** shows, two census tracts are located within the 6-mile radius; 06025010102 and 06025010101. However, the project site is within census tract 06025010102, and therefore this analysis focuses on that census tract.

Drinking Water Contaminants. Low-income and rural communities, particularly those served by small community water systems, can be disproportionately exposed to contaminants in their drinking water. CalEnviroScreen aggregates drinking water quality data from the California Department of Public Health, the U.S. EPA, and the California State Water Resources Control Board (SWRCB). The score provided by the Drinking Water Contaminant metric calculation is intended to rank water supplies relative to their history or likelihood to provide water that exceeds drinking water standards.

Census tract 6025010102 scored 31 percent in the Drinking Water Contaminants category (see Table 6-4). This indicates the drinking water contamination threat in this census tract is low to moderate, and that the community does not have a significant level of exposure to contaminants through drinking water. The project would not be expected to contribute significantly to drinking water source degradation. The project would be required to comply with the Clean Water Act (CWA) and California's Porter-Cologne Water Quality Control Act by controlling the discharge of pollutants during its construction and operation phases. In addition, the majority of drinking water is supplied from surface water sources from outside of the area. The project would implement modern storm water and containment controls that would improve upon the site's potential to release contaminants to the environment. The project's hydrology and water quality impacts would be reduced to less than significant for the census tract of concern and the general population.

Groundwater Threats. Common groundwater pollutants found at contaminant release sites in California include gasoline and diesel fuels; chlorinated solvents and other volatile organic compounds; heavy metals such as lead, chromium and arsenic; polycyclic aromatic hydrocarbons; persistent organic pollutants like polychlorinated biphenyls and pesticides; and perchlorate. CalEnviroScreen aggregates data from the SWRCB's GeoTracker website about groundwater threats. The score provided by the Groundwater Threat metric calculation is intended to rank the relative risk of environmental impact by groundwater contamination within each census tract.

Census tract 6025010102 scored 78 percent in the Groundwater Threat category (see Table 6-4). This indicates that the community is located alongside a high proportion of groundwater threats and is within the top 25 percent of tracts statewide.

The project would not be expected to exacerbate groundwater contamination, relative to existing conditions. The project would be required to comply with the CWA by controlling the discharge of pollutants during its construction and operation phases. The project would implement modern storm water and containment controls that would limit the site's potential to release contaminants to groundwater. The project would therefore not be expected to degrade groundwater quality any further than baseline conditions. The project's hydrology and water quality impacts would be reduced to less than significant for the census tract of concern and the general population.

Impaired Water Bodies. Rivers, lakes, estuaries, and marine waters in California are important for many different uses. Water bodies used for recreation may also be important to the quality of life of nearby residents if subsistence fishing is critical to their livelihood. Water bodies also support abundant flora and fauna. Changes in aquatic environments can affect biological diversity and the overall health of ecosystems. Aquatic species important to local economies may be impaired if the habitats where they seek food and reproduce are changed. Additionally, communities of color, low-income communities, and tribes generally depend on the fish, aquatic plants, and wildlife provided by nearby surface waters to a greater extent than the general population. CalEnviroScreen aggregates data from the SWRCB's Final 2012 California Integrated Report (CWA Section 303(d) List / 305(b) Report). The score provided by the Impaired Water Bodies metric calculation is intended to rank the relative risk of impaired water bodies within each census tract.

Census tract 6025010102 scored 99 percent in the Impaired Water Bodies category (see Table 6-4). This indicates the threat to impaired water bodies in this census tract is high, and that there may be a significant impact to the community and local wildlife.

The project would not be expected to further impair local water bodies. The project would be required to comply with the CWA by controlling the discharge of pollutants during its construction and operation phases. The project would implement modern storm water and containment controls that would limit the site's potential to release contaminants to the environment. The project's hydrology and water quality impacts would be reduced to less than significant for the census tract of concern.

List of Preparers and Contributors

The following are a list of preparers and contributors to **Section 6 Environmental Justice**:

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Brett Fooks	Hazards, Hazardous Materials, and Wildfire impact analysis
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James Ackerman	Water Resources, Solid Waste Management impact analyses.
Ellen LeFevre	Socioeconomics impact analysis.
Spencer Reed	Transportation impact analysis.
Mark Hamblin	Visual Resources impact analysis.

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Section 7

Public Benefits

7 Public Benefits

Ellen LeFevre

7.1 Public Benefits

Public Resources Code section 25523(h) requires the California Energy Commission's (CEC's) decision to contain a discussion of any public benefits from the project including, but not limited to, economic benefits, environmental benefits, and electricity reliability benefits. To facilitate the development of the CEC's final decision and to support any statement of overriding consideration, staff includes this chapter.

To assess public benefits staff considers the changes in local economy activity and local tax revenue that would result from project construction and operation. To assess the indirect and induced economic benefits of the project, the applicant used an IMPLAN input/output model of the Imperial County economy. The IMPLAN model includes county-level data to describe the local economy in a given year (2021) in an online platform. Impact estimates reflect two scenarios: the construction phase and the operations phase of the project. For both phases, the applicant estimated the total direct, indirect, and induced economic effects on employment and labor income.

Direct economic effects represent:

- employment,
- labor income, and
- spending associated with construction and operation of the project.

Indirect economic effects represent expenditures on intermediate goods made by suppliers who provide goods and services to the project. Induced economic effects represent changes in household spending that occur due to the wages, salaries, and proprietor's income generated through direct and indirect economic activity.

IMPLAN Model Components:

- Estimates do not represent a precise forecast, but rather an approximate estimate of the overall economic effect.
- Is a static model, meaning that it relies on inter-industry relationships and household consumption patterns as they exist at the time of the analysis.
- Assumes that prices remain fixed, regardless of changes in demand, and that industry purchaser-supplier relationships operate in fixed proportions.
- Does not account for substitution effects, supply constraints, economies of scale, demographic change, or structural adjustments.

Table 7-1 reports the applicant's estimates of the economic impacts/benefits that would accrue to Imperial County due to project construction and operation.

TABLE 7-1 MORTON BAY GEOTHERMAL PROJECT ECONOMIC BENEFITS (2022 Dollars)[1]	
TOTAL FISCAL BENEFITS	
Estimated Annual Property Taxes	$9.4 to $16.2 million
State and Local Taxes	
Construction	$6,060,100 (total), $1,368,400 (county)
Operation	$1,625,500
School Impact Fees	Total Estimated Fees: $47,000
	(Calipatria Unified School District)
TOTAL NON-FISCAL BENEFITS	
Total Capital Costs	$750 million to 1.3 billion
Construction Payroll (including benefits)	$108.1 million
Construction materials and supplies	$78.2 million
Operations Budget (annual)	$21 million
TOTAL DIRECT, INDIRECT, AND INDUCED BENEFITS	
Estimated Direct Benefits	
Construction Jobs	255 (average), 560 (peak)
Operation Jobs	61
Estimated Indirect Benefits	
Construction Jobs	647
Construction Income	$38,771,400
Operation Jobs	85
Operation Income	$11,648,100
Estimated Induced Benefits	
Construction Jobs	97
Construction Income	$4,436,600
Operation Jobs	23
Operation Income	$1,061,400

Notes: 1 Based on applicant's estimates. Source: Jacobs 2023a

Property Tax

The Board of Equalization (BOE) has jurisdiction over the valuation of a power generating facility for tax purposes if the power plant produces 50 megawatts (MW) or greater. For a power-generating facility producing less than 50 MW, the county has jurisdiction of the valuation. MBGP would be a 140- MW (net) power generating facility, and therefore, BOE is responsible for assessing property value. The property tax rate is set by the Imperial County Auditor- Controller's office. Property taxes are collected and distributed at the county level.

Construction of the power plant would add approximately $750 million to $1.3 billion (capital cost) and with a property tax rate consistent with the current rate (fiscal year 2022) for the existing project site (1.2478 percent), the project would generate approximately $ 9.4 to $16.2 million in property taxes during the first operation year of the project (Jacobs 2023). The revenue collected from property taxes is distributed among school districts, special districts, redevelopment trust funds, unincorporated areas, and incorporated areas (cities) by Imperial County.

Other Public Benefits

MBGP would provide the following environmental and reliability benefits:

- MBGP would help fulfill the long-term energy needs of California and goals of State Bill 100 by providing clean, efficient power using renewable geothermal resources. ENGP would be an eligible renewable energy resource able to satisfy California's Renewable Portfolio Standard (RPS) requirements and would generate geothermal energy 24 hours a day, 365 days a year, with an average availability of 95% or higher.
- MBGP would contribute to the State's goal for transitioning to a 100 percent renewable energy and zero-carbon resource supply to end-use customers by 2045 by providing 140 megawatts (net) baseload renewable electricity using geothermal resources. This generation would potentially displace generation from fossil fuel combustion.
- MBGP would contribute to the reliability of the state's grid by diversifying the types of renewable energy generation on the system and by offering reliable baseload renewable generation to complement wind and solar generation.

7.2 References

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Section 8

Alternatives

8 Alternatives

Jeanine Hinde[1]

8.1 Introduction

This section evaluates alternatives to the 140-megawatt (MW) Morton Bay Geothermal Project (MBGP or project). The MBGP would include a 14-cell cooling tower (Jacobs 2023a, 2023kk). California Energy Commission (CEC) staff considered the feasibility of alternative power plant cooling technologies to reduce the MBGP's water consumption. Cooling technology alternatives initially considered and not evaluated further, primarily due to feasibility issues or an inability to attain most of the basic project objectives, include the following: 1) Air-cooled condenser (ACC) or Air-cooled heat exchanger (ACHE) alternative, 2) Hybrid cooling system alternative (ACHE and cooling towers in combination), and 3) Wet surface air cooling system alternative.

Regarding alternative sites, several properties in the project area were evaluated as possible sites for the MBGP before being rejected, primarily due to greater environmental impacts and related construction challenges and site control issues. A reduced capacity version of the MBGP was considered by CEC staff and rejected due to an inability to substantially lessen the project's significant impacts, including impacts on cultural and tribal cultural resources.

No potentially feasible alternatives were identified that would 1) attain the key project objectives to develop a baseload renewable electrical generating facility capable of satisfying the energy resource procurement requirements under the California Public Utilities Commission Mid-Term Reliability Decision for 2023–2026, and 2) avoid or substantially lessen any of the project's significant impacts. Therefore, other than the No Project/No Build Alternative, no alternatives were fully analyzed and compared to the project.

8.2 CEQA Requirements

As the California Environmental Quality Act (CEQA) lead agency for the MBGP, the CEC is required to consider and discuss alternatives to the project. The CEQA Guidelines provide the regulatory requirements for an alternatives analysis in an environmental impact report (EIR) (Cal. Code Regs., tit. 14, § 15000 et seq.). Section 15126.6 of the CEQA Guidelines provides that the alternatives analysis must:

- describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project;
- evaluate the comparative merits of the alternatives;

1 Environmental and engineering staff members who contributed to the Alternatives analysis are listed at the end of this Alternatives section.

- focus on alternatives that would avoid or substantially lessen any significant effects of the project, even if these alternatives would impede to some degree attainment of the project objectives, or would be more costly; and
- describe the rationale for selecting alternatives to be discussed and identify alternatives that were initially considered but then rejected from further evaluation.

These regulations also apply to the document used in place of an EIR in a certified regulatory program (this staff assessment), including the site certification program of the State Energy Resources Conservation and Development Commission (CEC) (Pub. Resources Code, § 21080.5, subd. (a); Cal. Code Regs., tit. 14, §§ 15251, subd. (j), and 15252).

CEQA requires that an EIR "consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation" (Cal. Code Regs., tit. 14, § 15126.6, subd. (a)). Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are failure to meet most of the basic project objectives, infeasibility, or inability to avoid significant environmental impacts (Cal. Code Regs., tit. 14, § 15126.6, subd. (c)). The range of potentially feasible alternatives selected for analysis is governed by a "rule of reason," requiring evaluation of only those alternatives "necessary to permit a reasoned choice" (Cal. Code Regs., tit. 14, § 15126.6, subd. (f)).

An EIR is not required to consider alternatives that are infeasible (Cal. Code Regs., tit. 14, § 15126.6, subd. (a)). In addressing feasibility of alternatives, factors that may be taken into account are site suitability; economic viability; availability of infrastructure; general plan consistency; other plans or regulatory limitations; jurisdictional boundaries; and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site (Cal. Code Regs., tit. 14, § 15126.6, subd. (f)(1)). An EIR "need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative" (Cal. Code Regs., tit. 14, § 15126.6, subd. (f)(3)).

The lead agency is also required to evaluate the "no project" alternative along with its impact. Analyzing a no project alternative allows decision makers to compare the impacts of approving the project with the impacts of not approving the project (Cal. Code Regs., tit. 14, § 15126.6, subd. (e)(1)). "The 'no project' analysis shall discuss the existing conditions at the time the notice of preparation is published…as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services. If the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives" (Cal. Code Regs., tit. 14, § 15126.6, subd. (e)(2)).

8.3 Project Objectives and Alternatives Screening

Section 15124 of the CEQA Guidelines includes the requirement for an EIR to contain a statement of objectives, as follows:

A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should include the underlying purpose of the project and may discuss the project benefits.

The applicant's primary purpose for the MBGP is to develop, construct, and operate a baseload renewable electrical generating facility that supports grid reliability and the state's goal for a transition to a 100 percent renewable energy and zero-carbon resource supply to end-use customers by 2045 (Jacobs 2023a).

The project objectives are as follows:

- Construct and operate an approximately 140-megawatt (net) baseload renewable electrical generating facility that uses geothermal resources.
- Develop a renewable electrical generating facility that minimizes significant environmental impacts of project development through the use of existing infrastructure, existing real property interests and rights-of-way, project design measures, and feasible mitigation measures.
- Develop new incremental capacity from a facility eligible under California's Renewables Portfolio Standard (RPS) program[2] with a capacity factor of at least 80 percent capable of satisfying the procurement requirements of load serving entities, including California's utilities under the California Public Utilities Commission (CPUC) Mid-Term Reliability Decision 21-06-035 and related decisions.
- Develop an eligible renewable energy resource facility that can assist community choice aggregators, investor-owned utilities, and publicly-owned utilities in meeting their load serving obligations, including Resource Adequacy (RA)[3] and RPS program requirements.
- Encourage the responsible development of the Salton Sea Known Geothermal Resource Area region in a manner that benefits local and regional communities and tribes.
- Create new, high-paying construction jobs, operations and maintenance jobs, and skilled trades and professional roles in Imperial County, California.

2 California's RPS program requires every electric load serving entity to procure 60 percent of its electricity portfolio from eligible renewable energy resources by 2030. The CPUC and the CEC jointly implement the RPS program.

3 The CPUC RA policy framework—implemented as the RA program—guides resource procurement and promotes infrastructure investment by requiring that load serving entities procure capacity so that capacity is available to the California Independent System Operator when and where it is needed.

Key project objectives listed above specify development of a baseload renewable electrical generating facility capable of satisfying the energy resource procurement requirements under the CPUC's Mid-Term Reliability Decision for 2023–2026 and subsequent decisions. This is in reference to the CPUC's 2021 procurement order (D.21-06-035), which was designed to achieve greenhouse gas (GHG) reduction targets for 2030 and meet the ultimate goal of 100 percent zero-carbon electricity resources by 2045. D.21-06-035 includes a requirement to procure at least 1,000 megawatts of generating resources by 2026 with zero onsite emissions and a capacity factor of at least 80 percent.[4] Qualifying resources must be able to deliver firm power with no use limitations or weather dependencies (CPUC 2021). (D.23-02-040 extended the required year for bringing these resources online from 2026 to 2028.)

8.4 Environmental Impacts of the Project

As described above, CEQA requires a discussion of alternatives that would avoid or lessen any of the project's significant effects. Throughout this staff assessment, staff evaluates the impacts of implementing the project and recommends conditions of certification (COCs) and mitigation measures (MMs) to reduce potentially significant impacts to less-than-significant levels. For cultural and tribal cultural resources, CEC staff evaluated impacts on a tribal cultural resource, the Southeast Lake Cahuilla Active Volcanic Cultural District (SELCAVCD); COCs/MMs are recommended to reduce the severity of impacts on the SELCAVCD, although at least one impact, Visual Degradation of the SELCAVCD Viewshed, remains significant even after implementation of available COCs/MMs (see section **5.4 Cultural and Tribal Cultural Resources** of this staff assessment).

For project issues covered in sections **4.1 Facility Design**, **4.3 Transmission System Engineering**, **4.4 Worker Safety and Fire Protection**, **5.13 Transmission Line Safety and Nuisance**, and **5.14 Transportation**, conformance with applicable laws, ordinances, regulations, and standards (LORS) would provide reasonable assurances that project construction and operation would be done in a manner that protects public health and safety; the recommended COCs/MMs primarily require fulfillment of permitting requirements, preparation and implementation of plans and programs, and oversight of regulatory processes to help ensure compliance with LORS.

For the other topics covered in section **5 Environmental Impact Assessment**, COCs/MMs are recommended for a mix of project-specific resource impacts and to ensure the project would comply with applicable LORS. This analysis of alternatives includes discussions of whether any of the project impacts could be substantially lessened or avoided by an alternative (see subsection "8.5 Alternatives Considered and Not Evaluated Further," below). Impacts associated with the MBGP are summarized as follows:

- **Air Quality** – Project construction would cause impacts relating to onsite and offsite air emissions from equipment use, site grading, materials dumping and loading, and vehicles traveling on paved and unpaved roads.

4 Capacity factor is a measure of how much energy a power plant produces over time.

Project operations would cause emissions of criteria pollutants from several power plant facilities, including the diesel-fired emergency generators, which would be equipped with Tier 4 certified engines.

The Imperial County Air Pollution Control District issued its Preliminary Determination of Compliance (PDOC) for the project, which contains Authority to Construct and Permit to Operate Conditions. These conditions apply to each unit of equipment and the project facility as a whole. The conditions are reproduced in section **5.1 Air Quality** of this staff assessment.

Implementation of all COCs/MMs for air quality contained in section **5.1 Air Quality** would reduce potentially significant impacts to less than significant.

- **Biological Resources** – Construction of the MBGP has the potential to cause direct and indirect impacts on four special-status plants that have a low potential to occur in the project area. Of the four, impacts on dwarf germander, if present, would be significant.

  Most of the project site does not provide natural habitat and foraging resources for Crotch's bumble bee, although the project area has some potential nesting and overwintering habitat should the bees be present on land adjacent to the project site. If this species is present, project construction could cause direct impacts, including loss or modification of foraging and nesting habitat, disturbance or destruction of occupied nesting sites, and exposure of individuals or nesting sites to human disturbance, fugitive dust, ground vibration, and hazardous materials. Indirect impacts could include the loss or degradation of habitat from invasive weeds.

  Desert pupfish are presumed to be present in Imperial Irrigation District (IID) water conveyance infrastructure, and significant direct impacts on this species could occur if construction of project infrastructure were to cause changes to aquatic habitat. Changes could include inundation of work areas, dewatering of habitat, accidental hazardous materials spills, exposure to fugitive dust, and vibration from pipe and pole installation. Indirect impacts on the species could also occur.

  Project construction could cause direct impacts on special-status and common bird species through destruction of nests or eggs or disruption of breeding behavior. Indirect impacts could include loss of habitat due to colonization of invasive or noxious weeds and long-term alterations of habitat. Project construction could directly impact habitat used by birds for foraging or winter migration.

  Project construction could directly impact burrowing owl burrows. Indirect impacts on burrowing owls could include loss or degradation of foraging or breeding habitat. Construction work could destroy occupied burrows or cause owls to abandon burrows. It is likely that up to six occupied burrows are within the project disturbance footprint. Human presence, noise, and fugitive dust could cause temporary impacts on breeding behavoir and possibly nest abandonment.

The project area could provide habitat for denning mammal species. Direct impacts on denning mammals during project construction could include loss of individual animals, destruction of natal dens, disruption of breeding behavior, and temporary and permanent loss of habitat.

A concrete-lined brine pond would be constructed at the power plant site to collect geothermal fluid. Wildlife could gain access to the brine pond and experience toxicity through ingestion or injury or mortality from entrapment. Brine ponds represent a potential source of hazardous waste and emissions; spill-related contamination could cause direct impacts on aquatic resources and wildlife habitat.

The project would include construction of a transmission line to tie into the IID transmission system. Avian species can be electrocuted by transmission lines from flying into the electrical lines, if wings simultaneously contact two conductors of different phases, or if body parts simultaneously contact a conductor and grounded hardware.

The project would cause temporary and permanent impacts on vegetation communities, including agricultural land, riparian habitat, and native habitat. It could also cause temporary impacts on canals or drains. Project design changes, should they occur, could cause temporary and permanent impacts on riparian or marshland habitat. The project could also cause direct and indirect impacts on native vegetation communities and sensitive habitats.

Implementation of all COCs/MMs for biological resources and all other COCs/MMs referenced in section **5.2 Biological Resources** would reduce potentially significant impacts to less than significant.

- **Cultural and Tribal Cultural Resources** – The MBGP has the potential to cause significant impacts on buried or inadvertently discovered cultural or tribal cultural resources and on a tribal cultural resource (the Southeast Lake Cahuilla Active Volcanic Cultural District). The archaeological project area of analysis has a moderate probability of containing buried archaeological resources, which could meet CEQA's criteria for historical resources. If such resources were damaged during construction, it would be considered significant because of the cultural loss to affiliated California Native American tribes or other local communities and the cultural and scientific data loss to all. Ground disturbance associated with project construction could result in the inadvertent discovery of human remains and associated funerary items that meet CEQA's criteria for historical, unique archaeological, or tribal cultural resources. Damage to human remains would be a significant impact under CEQA. With implementation of several recommended COCs/MMs for cultural and tribal cultural resources, these potentially significant impacts would be reduced to less than significant.

  The Southeast Lake Cahuilla Active Volcanic Cultural District (SELCAVCD) is a significant tribal cultural resource for the purposes of CEQA. Project construction

would cause several types of impacts on the SELCAVCD. The power plant would cause visual degradation of the SELCAVCD viewshed and dramatic changes to viewsheds to and from the SELCAVCD; COC/MM **CUL/TRI-8** requires a professional cultural anthropologist to complete detailed documentation of the SELCAVCD and nominate the cultural district to the California Register of Historical Resources and the National Register of Historic Places. Although **CUL/TRI-8** would reduce the severity of impacts on the SELCAVCD, the impact remains significant even after implementation of **CUL/TRI-8**.

Exterior nighttime lighting of project facilities would introduce intrusive nighttime visual elements that could diminish the historic integrity of the SELCAVCD; such nighttime visual intrusions would be a significant impact on this tribal cultural resource. With implementation of COCs/MMs for visual resources to reduce the potential effects of light and glare, this impact on cultural and tribal cultural resources would be reduced to less than significant (see section **5.15 Visual Resources**).

Project components like the service water pond, retention basin, and brine pond could attract and entrap or otherwise harm animals that the Kamia (California Indian ethnolinguistic group) consider integral to the SELCAVCD; this impact would be significant under CEQA for harming character-defining features of the SELCAVCD. With implementation of a COC/MM for biological resources, potential impacts on culturally important animals such as coyotes, reptiles, and burrowing owls and other birds would be reduced to less than significant (see section **5.2 Biological Resources**).

There are mud volcanoes and mud pots in the project area that are sites of healing, gathering pigment, and gathering. Project operations would include wells for water injection and geothermal fluid production in the geothermal reservoir. This process could alter the way the mud volcanoes and mud pots exhibit their living qualities (heartbeat and breath). Such changes, in turn, could degrade the therapeutic qualities of the mud pots and volcanoes. These project effects would cause severe damage to the SELCAVCD and degrade a prominent contributor to the district; COC/MM **CUL/TRI-9** requires monitoring and reporting on the functioning of the mud volcanoes and mud pots. This work must include the Cultural Resource Specialist assigned to the project and the Kwaaymii Laguna Band of Mission Indians, Agua Caliente Band of Cahuilla Indians, and Fort Yuma Quechan Tribe. **CUL/TRI-9** would reduce the severity of the impact on the Mud Volcanoes and Mud Pots; however, it is unclear whether the impact could be reduced to less than significant after implementation of **CUL/TRI-9**.

- **Geology, Paleontology, and Minerals** – Impacts relating to geologic hazards are reduced to less than significant through implementation of a COC/MM requiring conformance with geotechnical and geological investigation and design guidelines of the California Building Code.

Construction activities involving grading, trenching, drilling, and excavation would impact Lake Cahuilla bed sediments. Deep excavation and drilling could penetrate older, buried geologic deposits where paleontological resources could be encountered. Several COCs/MMs are recommended to address the potential for discovery of paleontological resources during excavation in native materials. With implementation of the COCs/MMs, these potentially significant impacts would be reduced to less than significant.

- **Hazards, Hazardous Materials/Waste, and Wildfire** – Project construction would include transport of common hazardous substances to the project site that would be used and stored at the project site; implementation of two COCs/MMs requiring development of construction worker safety programs and procedures to protect workers from exposure to hazardous materials and waste would reduce potential impacts to less than significant (see section **4.4 Worker Safety and Fire Protection**).

  Project operations and maintenance work would include the transport, use, and storage of various hazardous materials, including diesel fuel and hydrochloric acid; implementation of several COCs/MMs for hazards and hazardous materials or waste would reduce potentially significant impacts to less than significant.

  Project site preparation and construction and pipeline construction would disturb the ground, and this work could encounter contaminated groundwater or soil; implementation of COCs/MMs for hazards and hazardous materials or waste would ensure worker protection from potential toxicant exposure and reduce potentially significant impacts to less than significant.

- **Land Use, Agriculture, and Forestry** – Project construction would include development of materials laydown and parking areas and borrow pits, and temporary camps for construction workers could also be needed. Permanent offsite project components would also be constructed. Implementation of a COC/MM would ensure compliance with applicable LORS for temporary construction facilities and permanent structures. Project construction could encroach on the IID's water and power delivery infrastructure; implementation of a COC/MM to obtain an encroachment permit, if needed, would reduce this potentially significant impact to less than significant.

  Project facilities would permanently convert approximately 6 acres of land classified as "Important Farmland" to a non-agricultural use (the shared switching station site). CEC staff used the California Agricultural Land Evaluation and Site Assessment (LESA) Model prepared by the California Department of Conservation (CDOC) to help determine impact significance of this conversion of Important Farmland. Using LESA model scoring thresholds, staff concluded that conversion of agricultural land at the switching station site would cause a significant impact on Important Farmland. Staff recommends a COC/MM requiring implementation of one of Imperial County's mitigation options to compensate for the permanent conversion of Important

Farmland, which would reduce the impact to less than significant. The power plant site, well pad areas, and pipeline alignments include no Important Farmland.

Some areas planned for materials laydown and parking during construction and possible camps for construction workers are classified as Important Farmland, and borrow pit sites would be graded and excavated on land classified as Important Farmland; a COC/MM requiring implementation of a restoration plan for temporarily disturbed and altered areas would reduce this impact to less than significant.

The project would make a cumulatively considerable contribution to the impact of converting Important Farmland to a non-agricultural use; a COC/MM specifying options to compensate for the permanent conversion of Important Farmland would reduce this impact to less than significant.

- **Noise and Vibration** – Use of certain equipment during demolition and construction would increase ambient noise levels at the Sonny Bono National Wildlife Refuge and Red Hill Marina Park. Use of pile drivers would generate noise that could exceed ambient noise levels at both of these sensitive receptor locations. Noise from steam blows during power plant commissioning could increase ambient noise levels at sensitive receptor locations. With implementation of several COCs/MMs, potentially significant construction-related noise impacts would be reduced to less than significant. During project operations, ambient noise levels would not increase at sensitive receptors.

- **Visual Resources** – The project has the potential to cause new sources of substantial light or glare that could adversely affect day or nighttime views in the area. Sunlight reflecting from project structures and building surfaces could cause daytime light or glare effects for views from publicly accessible vantage points. With implementation of COCs/MMs, potentially significant impacts from light and glare would be reduced to less than significant.

- **Water Resources** – Ground-disturbing construction activity could cause substantial degradation of water quality or an increase in rate or volume of stormwater runoff; implementation of COCs/MMs addressing all project elements of stormwater management during project construction and operations would reduce potentially significant impacts to less than significant. A concrete-lined brine pond would be constructed at the power plant site to collect geothermal fluid; a COC/MM requires compliance with the Waste Discharge Requirements of the Colorado River Basin Regional Water Quality Control Board for operation of the project's brine pond. Other COCs/MMs would prevent surface water runoff from causing onsite or offsite flooding during project construction and operation. Project operations would include injection of geothermal brine underground to replenish the geothermal reservoir; a COC/MM requires preparation and submittal of a Groundwater Quality Monitoring and Reporting Plan to monitor groundwater quality in the vicinity of the brine pond. A COC/MM requires that permits be obtained from the California Geologic Energy Management Division for installation and operation of the geothermal production and injection

wells. A COC/MM requires certification by a California registered civil engineer or architect to ensure the project meets the floodproofing criteria contained in the Imperial County Flood Damage Prevention Regulations. A COC/MM requires onsite septic systems to comply with state and local regulatory and permitting requirements for onsite wastewater treatment systems.

The project's estimated operational water use would be 5,560 acre-feet per year. To account for the possibility of future water conservation measures being imposed on IID, a COC/MM requires implementation of an agreement with IID to specify limits for water use during project construction and operation; daily recording of water use is required. The project would include a service water pond to hold IID water for the power plant; a COC/MM requires installation of a floating cover over the service water pond to avoid water loss due to evaporation.

With implementation of all COCs/MMs, potentially significant impacts on water resources would be reduced to less than significant.

8.5 Alternatives Considered and Not Evaluated Further

CEQA provides that the range of alternatives to the project, or to the location of the project, is to include those that would feasibly attain most of the basic project objectives but would avoid or substantially lessen any of the project's significant effects. CEQA defines feasible as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors" (Cal. Code Regs., tit. 14, §§ 15126.6, subd. (c), and 15364).

The MBGP would use a 14-cell cooling tower, which is the industry standard for a heat rejection system for a geothermal flash power plant like this one. Staff considered the feasibility of alternative power plant cooling technologies to reduce water consumption. These alternatives were initially considered by staff before being eliminated from detailed consideration due to potential feasibility issues that would likely prevent their successful development. Section **5.16 Water Resources** discusses long-term reliability of water supply for the MBGP, the Elmore North Geothermal Project (ENGP), and the Black Rock Geothermal Project (BRGP), all planned for concurrent construction. With implementation of the COCs/MMs described above, the projects would not cause significant impacts on water supply; however, staff considered it prudent to investigate the potential feasibility of alternative cooling technologies that might reduce water consumption.

Regarding alternative sites, the applicant evaluated other potential properties, all located in the Salton Sea Geothermal Field, before rejecting them due to greater environmental impacts and related construction challenges (Jacobs 2023a). The analysis included the proposed MBGP site. CEC staff considered whether a reduced capacity version of the project could substantially lessen significant impacts on cultural and tribal cultural resources before concluding that such a project alternative would make a marginal difference in the overall effects of impacts on those resources.

The following discussions provide staff's reasons for eliminating these alternatives from further analysis and comparison to the MBGP.

8.5.1 Air-cooled Condenser (ACC) or Air-cooled Heat Exchanger (ACHE) Alternative

An ACC is a direct dry-cooling heat rejection system. High-temperature fluid vapor (i.e., steam) exits the turbine exhaust and enters the ACC where heat rejection and condensation occurs. Fluid vapors pass through finned tubes arranged in parallel rows. An axial fan forces cool air across the finned tubes, thereby rejecting heat and condensing the vapor. ACCs are traditionally manufactured with carbon steel material.

Similar to an ACC, an ACHE is a direct dry-cooling heat rejection system. However, fluid vapor enters a surface condenser, converting vapor into fluid. Then the condensed fluid enters the ACHE where additional heat rejection occurs. In the ACHE, condensed fluid passes through finned tubes arranged in parallel rows, and an axial fan forces cool air across the finned tubes. ACHEs are manufactured with stainless steel material. Stainless steel is less susceptible to corrosion and the corrosive elements in the geothermal fluid.

ACCs and ACHEs could each replace the cooling tower; however, an ACHE would still require a surface condenser. Replacing the cooling tower with either an ACC or ACHE would eliminate the need for makeup water. Makeup water, which would be supplied by IID, accounts for water loss (drift) from the open system design of the cooling tower.

8.5.1.1 Potential Feasibility Issues

Potential feasibility issues with these systems include the following: the metallurgy's suitability for an alternative with direct dry cooling, increased cooling equipment footprint, increased water consumption to meet net generating capacity, and unproven reliability.

Elements found in the geothermal resource have corrosive properties. The corrosive elements would affect the carbon steel material in ACCs such that its functionality to consistently cool the geothermal fluid would be reduced significantly.

Cooling towers provide more cooling capacity than both ACCs and ACHEs, because water is better (i.e., more efficient) at cooling than air. As a heat transfer medium, water has four times more cooling capacity than air.[5] This means, for 1 pound (lb.) of water it takes 4 lb. of air to have the same heat rejection. In cooling towers, heat rejection is increased further through evaporation (latent heat of vaporization).[6] Evaporation is a heat rejection process in which small amounts of water absorb heat from air, wherein this water changes phase from liquid to vapor and exits the cooling tower cell in the form of plume. This

5 Specific heat capacity of water is 1-British thermal unit per pound mass Fahrenheit (BTU/lb-F). Specific heat capacity of air is 0.24 BTU/lb-F.

6 Latent heat of vaporization is the amount of heat required to convert a unit mass of liquid into vapor at constant pressure and temperature (i.e., 1 lb. of liquid mass at the standard atmospheric pressure of 14.7 lb. per square inch and its boiling point of 212 degrees Fahrenheit requires 970 BTU to convert it into a vapor). The latent heat of vaporization is lower at higher temperatures and pressures.

facilitates the effective cooling of the remaining amounts of water and air in the cooling tower. As a result, for the same cooling capacity cooling towers provide, the number of units and footprint needed for an ACC or ACHE would greatly increase, although the additional acreage required to accommodate the equipment for either system is unknown.

These systems use fans to increase cooling capacity, and fans require power. However, the ACC and ACHE's fans require more power to run, and thus, they would increase the power plant's parasitic load. An increase in parasitic load would decrease the project's net generating capacity. This loss can, however, be accounted for by increasing the geothermal fluid's input to allow the project's net capacity to be unchanged. Increasing the fluid input to meet net capacity would require more water for the geothermal fluid dilution process. As a result, replacing the cooling towers with ACCs or ACHEs would eliminate makeup water, but might not reduce the project's total water consumption.

Both ACCs and ACHEs are effective at conserving water, especially in water-scarce locations. Traditional power plants use these technologies (e.g., natural gas-fired plants throughout the state), and they are proven and reliable. However, these technologies have not been commercially proven in flashed geothermal steam power plants. These alternatives would be the first of their kind in operation for this type of project—their reliability is unknown.

8.5.2 Hybrid Cooling System Alternative (ACHE and Cooling Towers)

A hybrid cooling system would consist of paring ACHEs in parallel with cooling towers. An ACHE would provide primary cooling capacity during average temperature days. When temperatures reach a threshold (hot days) requiring more cooling capacity, the cooling towers would be operated to provide additional cooling.

8.5.2.1 Potential Feasibility Issues

Potential feasibility issues with this system include the following: increased cooling equipment footprint, increased water consumption to meet net generating capacity, and unproven reliability.

As stated above, cooling towers are better at cooling than ACHEs. However, having a hybrid system could resolve cooling capacity issues during hot days. A hybrid system would reduce the total number of cooling towers, but the cooling towers would have to be replaced by ACHEs. This system could increase the required cooling equipment footprint onsite. The additional acreage that could be required to feasibly accommodate the equipment for a hybrid cooling system is unknown.

As stated above, ACHEs would increase the parasitic load for the project, but increasing the geothermal fluid input would allow the proposed net capacity to be unchanged. Increasing the fluid input to meet net capacity would require more water for the dilution process. Replacing a few cooling tower cells with ACHEs might not reduce the project's total water consumption.

ACHEs and cooling towers are individually proven and reliable in traditional power plant applications. However, combining them in a hybrid system is still unproven, since utilizing the ACHE technology in a flashed geothermal fluid power plant has not yet been commercially proven. This Hybrid Cooling System Alternative would form an experimental technology—its reliability is unknown.

8.5.3 Wet Surface Air Cooling System (WSAC) Alternative

A WSAC is an alternative to a cooling tower. This system merges both evaporative cooling (cooling tower) and dry cooling (ACC/ACHE) technologies. Condensed fluid enters the WSAC and passes through tube bundles arranged in parallel rows, and an axial fan forces cool air across the finned tubes. In addition, the tube bundles are sprayed with water, and evaporative cooling is used to reject heat further.

WSAC systems consume water and use power more efficiently than evaporative and dry cooling systems, respectively, especially during hot summers. This system could contribute to water conservation efforts.

8.5.3.1 Potential Feasibility Issues

A potential feasibility issue with this system is that it is less efficient at heat rejection than cooling towers, especially in regions with high temperatures and low humidity (e.g., the project site). Because it is less efficient, it might require more units and onsite space to achieve the same cooling capacity as a cooling tower. The additional acreage that could be required to feasibly accommodate the equipment for a WSAC system alternative is unknown.

Another potential feasibility issue is a reduction of the proposed net capacity for the project. Similar to dry cooling, fans are used to increase the cooling capacity of this system. Fans also increase the parasitic load. This increase can be offset by processing more geothermal fluid to achieve the proposed net capacity. However, this process demands more water for the dilution process, which could counteract the water savings intended by this alternative cooling technology.

WSAC is a proven and reliable technology. However, as an alternative for this project where flashed geothermal fluid needs to be cooled, it is unproven. This alternative would be the first of its kind in operation for this type of project—its reliability is unknown.

8.5.4 Alternative Sites

The potential feasibility of an alternative site might depend on whether an alternative location has the resources and conditions necessary to facilitate construction and operation of a project. CEQA provides that "in some cases there may be no feasible alternative locations for a geothermal plant or mining project which must be in close proximity to natural resources at a given location" (Cal. Code Regs., tit. 14, § 15126.6, subd. (f)(2)(B)). The MBGP site is in a subarea of the Salton Sea Known Geothermal Resource Area (Salton Sea KGRA) called the Salton Sea Geothermal Field (CDOC 2013,

Jacobs 2023a). The Salton Sea KGRA has been known to have significant geothermal reserves since exploration of the resource in Imperial County began several decades ago. **Figure 8-1** shows the conceptual boundaries for the Salton Sea KGRA and the Salton Sea Geothermal Field.

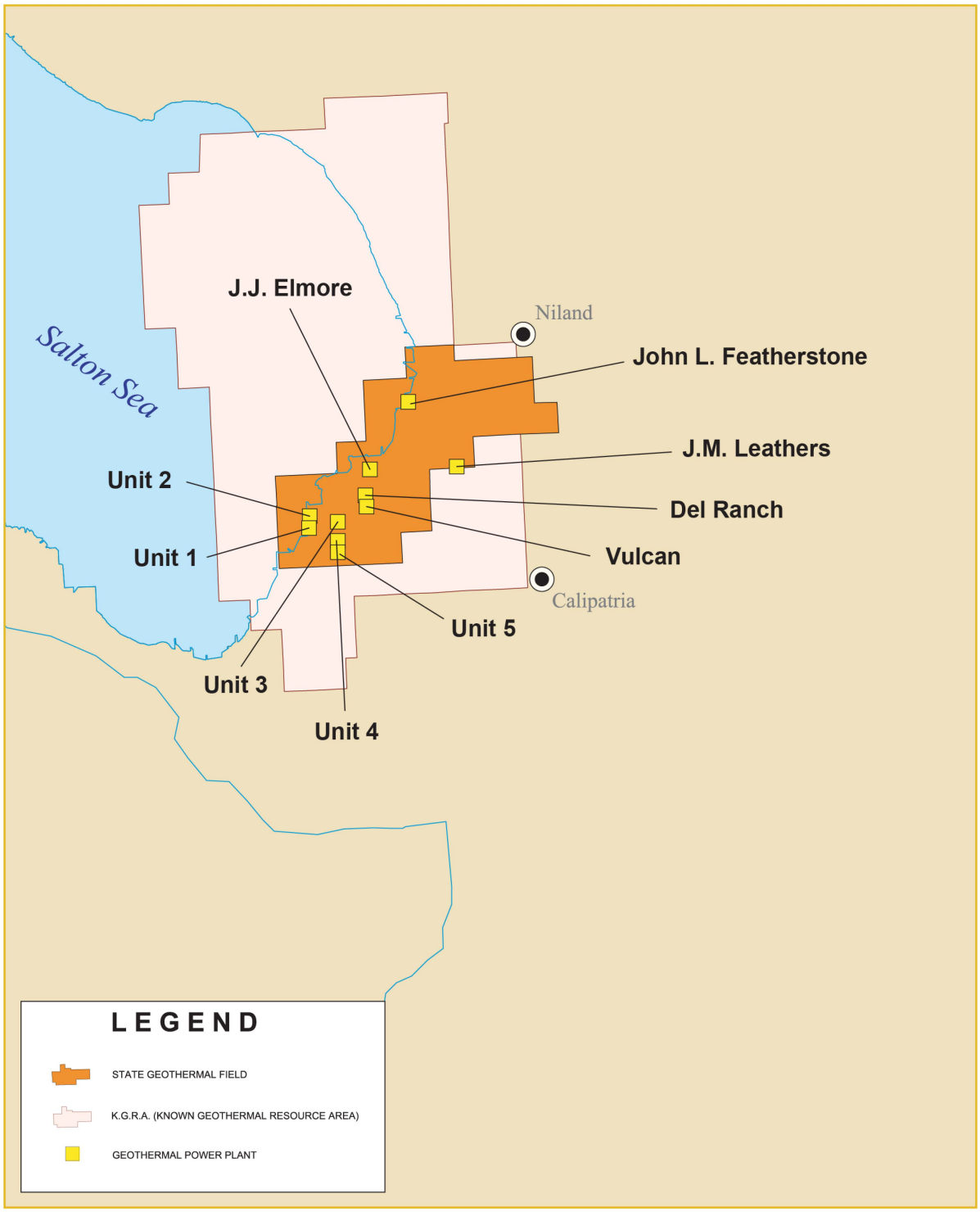

Figure 8-1
Existing Geothermal Power Plants at The Salton Sea

Source: IID 2016

Another facet of considering alternative sites is to determine which impacts of the project might be avoided or reduced at a different site. CEQA states that "[o]nly locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR" (Cal. Code Regs., tit. 14, § 15126.6, subd. (f)(2)(A)). The applicant's analysis of potential alternative sites eliminated some sites in part because environmental impacts would not be avoided or reduced, and at some properties the impacts could be greater. CEC cultural resources staff evaluated whether changes to MBGP facility locations could feasibly reduce impacts on resources discussed in section **5.4 Cultural and Tribal Cultural Resources** of this staff assessment.

8.5.4.1 Alternative Sites Evaluated by The Applicant

The applicant evaluated several properties in the Salton Sea Geothermal Field where the geothermal resource is proven to have the high heat flows needed for the project, including the MBGP site. The project site would allow locating the production and injection wells where sufficient capacity could be sustained for the project life (Jacobs 2023a, 2023bb).

Properties considered by the applicant for siting the MBGP are listed in **Table 8-1**. Most of them were rejected because of probable greater impacts on special-status species habitat and wetlands and other sensitive resources (Jacobs 2023bb). According to the applicant, configuring the project to avoid resources would cause greater construction challenges compared to the MBGP. Site ownership was considered in terms of whether the applicant could feasibly gain site control. Some properties where the applicant does not control the underlying minerals were determined too risky given that the mineral leaseholder might want to access the subsurface resources on a property where project facilities were installed. By comparison, the applicant owns the MBGP property and is the mineral leaseholder. **Figure 8-2** in this section shows the locations of these properties relative to the MBGP project site and the boundary of the Salton Sea Geothermal Field, based on mapping by the California Department of Conservation (CDOC); the properties are within an approximate 1½-mile radius of the MBGP site. **Figure 2-3** in the application shows the applicant's mineral leaseholds, including the properties considered for the MBGP (Jacobs 2023a).

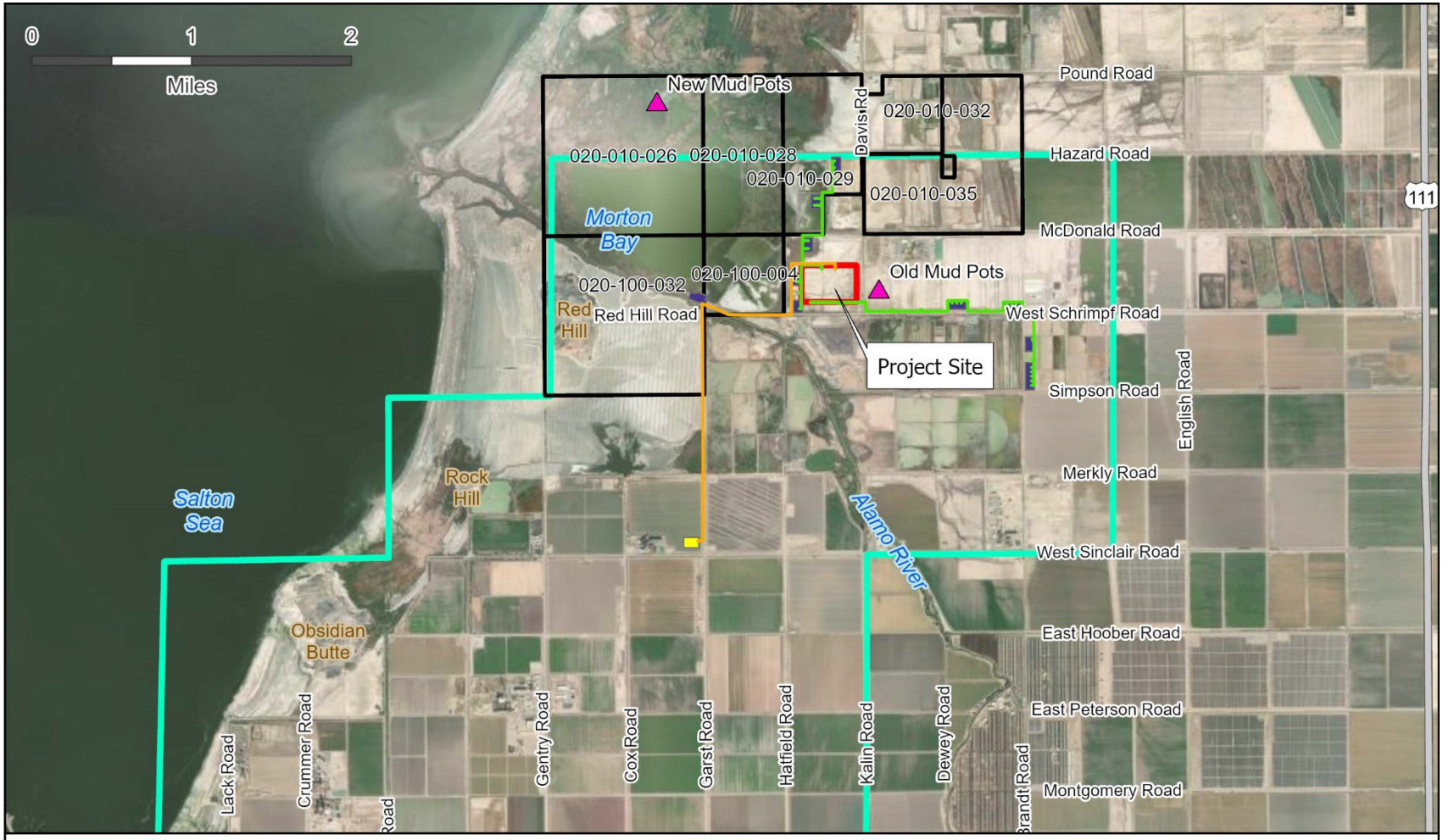

Figure 8-2
Alternative Project Sites Considered by the Applicant for the MBGP

Sources: CDOC 2013, Jacobs 2023bb, Imperial County 2024, and CEC Staff

TABLE 8-1. PROPERTIES CONSIDERED BY THE APPLICANT FOR THE MBGP

APN	Owner	BHER Mineral Leaseholder (Y/N)	Applicant Comments
020-100-004	Private	Y	Rejected due to habitat and wetlands impacts and related construction challenges.
020-010-026	Private	Y	Same as property -004, above.
020-100-032	Private	Y	Same as property -004, above.
020-010-028	Private	Y	Same as property -004, above.
020-010-029	Private	Y	Same as property -004, above.
020-010-032	Private	N	Rejected, BHER does not have mineral rights.
020-010-035	BHER	N	Same as property -010-032, above.

Notes: BHE Renewables and its affiliates (BHER), Assessor's Parcel Number (APN).

8.5.4.2 Cultural and Tribal Cultural Resources

The CEC held its Joint Environmental Scoping Meeting and Informational Hearing for the three geothermal power plant projects on August 31, 2023. Representatives of California Native American tribes in attendance described concerns with the siting of MBGP facilities near resources, including those associated with the Southeast Lake Cahuilla Active Volcanic Cultural District (SELCAVCD). Tribal representatives requested an analysis of the feasibility of incorporating cultural resource buffering into project facility planning (CEC 2023).

CEC staff facilitated in-field, intertribal meetings in the project area on February 9 and 26, 2024. Items discussed included project site physical features and elements of the SELCAVCD in or near the three geothermal projects. Tribal representatives and CEC staff together visited the project locations and many elements of the SELCAVCD, traversing these areas on foot wherever possible. Tribal representatives expressed concerns about potential impacts on contributing elements of the SELCAVCD, many concerning direct impacts on the physical expression of the mud pots and mud volcanoes, as well as potential impacts on cultural viewsheds, traditional soundscapes, culturally important biotic resources, noise and light pollution, and their ability to continue to use the district as a ceremonial and teaching place. Tribal representatives expressed that the project would be too close to the culturally sensitive SELCAVCD. Stating that the project should be moved farther away, tribal representatives cited the circumstances of the Salt River Project and Zuni Salt Lake where a coal mine was proposed 11 miles from Zuni Salt Lake, a sacred salt source within a larger volcanic cultural landscape. Plans for the coal mine were ultimately abandoned. Citing the Salt River example, tribal representatives indicated that a culturally appropriate buffer around the SELCAVCD is on a scale of several miles, if not tens of miles.

CEC cultural resources staff also evaluated the properties considered by the applicant for the MBGP that are listed in **Table 8-1**. Information on cultural and tribal cultural resources relating to those properties is summarized in **Table 8-2**.

TABLE 8-2. SUMMARY OF CULTURAL AND TRIBAL CULTURAL RESOURCES AT PROPERTIES CONSIDERED BY THE APPLICANT

APN	Cultural and Tribal Cultural Resources
020-100-004	Property is within the SELCAVCD and includes the Pond of Good Water (CA-IMP-003251H), a contributing resource to the district.
020-010-026	Property is within the SELCAVCD and includes the New Mud Pots and Volcanoes, a contributing resource to the district.
020-100-032	Property is within the SELCAVCD and includes Red Island, a contributing resource to the district.
020-010-028	Property is within the SELCAVCD and abuts the Pond of Good Water (CA-IMP-003251H), a contributing resource to the district.
020-010-029	Property is partially within the SELCAVCD and abuts the Pond of Good Water (CA-IMP-003251H), a contributing resource to the district.
020-010-032	Property abuts the SELCAVCD.
020-010-035	Property abuts the SELCAVCD.

8.5.4.3 Potential Feasibility Issues

Relocating the MBGP to achieve the buffer described by tribal representatives would move project facilities roughly 7–10 miles beyond the boundary of the Salton Sea Geothermal Field for areas north, east, and south of the project site (**Figure 8-2**). Viability of the MBGP depends on the geothermal resource and the high heat flows in the Salton Sea Geothermal Field; therefore, removing the project from the region where the resource is present would make it infeasible.

Some of the properties initially considered by the applicant might be feasible depending on the hypothetical resolution of construction challenges, resource issues, and site control (**Table 8-1**). However, none of the alternative properties would avoid or reduce impacts on cultural and tribal cultural resources, and for some properties, especially those located within the SELCAVCD, impacts would be greater than the MBGP.

8.5.5 Reduced Capacity Alternative

The MBGP power plant site would cover approximately 51 acres on a 160-acre parcel. CEC staff considered whether reducing the generating capacity of the MBGP from a 140-MW project to an approximately 77-MW alternative (i.e., a Reduced Capacity Alternative) at the project site could substantially lessen any of the project's significant impacts, including impacts on cultural and tribal cultural resources. (A summary of MBGP impacts on cultural and tribal cultural resources is included under subsection "8.4 Environmental Impacts of the Project," above.) The characteristics of this alternative are based on those of the proposed 77-MW BRGP, which would also cover approximately 51 acres on a 160-acre parcel.

The potential for sound intrusion to negatively impact the SELCAVCD is an issue of concern to California Native American tribal representatives (see section **5.4 Cultural and Tribal Cultural Resources**). CEC facility design staff concluded that the project operations noise effects at or near the project boundary for the MBGP would not be noticeably different compared to the 77-MW BRGP. The footprint for a Reduced Capacity Alternative would occupy the same power plant area on the MBGP property. Noise levels at sensitive receptor locations would be the same under a Reduced Capacity Alternative.

The MBGP would require a few more geothermal injection and production wells compared to the 77-MW BRGP. The potential effects of operating the geothermal production and injection wells on the "surface expressions" (sound, frequency of bubbling, and steam emitted) of the mud pots and volcanoes are unknown. It is also unknown if fewer wells for an alternative the size of the BRGP would change the surface expressions of the mud pots and volcanoes.

View obstruction of elements in the SELCAVCD and light pollution are among the issues of concern to California Native American tribal representatives. The massing of power plant facilities at the MBGP site would be similar to that of the BRGP. The effects of the MBGP on the SELCAVCD would not be substantially lessened by a Reduced Capacity Alternative. The effects of this alternative on access to the SELCAVCD by Native Americans for ceremonial and educational purposes would be similar compared to the MBGP. Likewise, the potential power plant lighting effects for the MBGP would not be substantially lessened compared to an alternative like the BRGP. Under this alternative, the impacts on cultural and tribal cultural resources would parallel those of the MBGP, and the resulting impacts would be significant.

The power plant site acreage required for a Reduced Capacity Alternative would be the same compared to the MBGP, and site configuration and equipment requirements would be similar. As stated above, the footprint for a Reduced Capacity Alternative would occupy the same power plant area on the MBGP property. Therefore, impacts on biological resources would be the same or similar under a Reduced Capacity Alternative.

For all topics covered in this staff assessment, a Reduced Capacity Alternative at the MBGP site would not change the significance levels of impacts or the conditions of certification and mitigation measures to reduce impacts to less than significant (see subsection "8.4 Environmental Impacts of the Project," above). A Reduced Capacity Alternative was not fully analyzed and compared to the MBGP because none of the project's significant impacts would be substantially lessened by this alternative.

8.5.6 Decision to Eliminate These Alternatives from Further Consideration

The applicant's primary purpose for the MBGP is to develop, construct and operate a baseload renewable electrical generating facility to support grid reliability and the state's goal for a transition to a 100 percent renewable energy and zero-carbon resource supply to end-use customers by 2045 (Jacobs 2023a).

The MBGP would be a baseload power plant with a capacity factor of at least 80 percent; meaning, it would mostly operate around the clock. Having a cooling system with an unknown level of reliability would significantly reduce the power plant's ability to generate electricity continuously, which could affect the reliability of the electricity grid. Therefore, any alternative cooling technology would require a comprehensive assessment of its total water-saving potential, as well as any operational challenges. A geothermal project developer considering alternative cooling technologies not yet deployed in a desert environment would likely need to conduct a detailed analysis of a project's specific conditions to find the right balance between water conservation while also meeting its operational demands. CEC staff concludes that no known alternative cooling technology could be substituted for the project's cooling towers without compromising power plant reliability objectives.

The applicant evaluated several properties in the Salton Sea Geothermal Field where the geothermal resource is proven to have the high heat flows needed for the project. These properties were rejected primarily due to an inability to avoid onsite sensitive habitats and wetlands; construction challenges; and site access issues, including access to the underlying geothermal resource. Based on the preferences for resource buffering expressed by California Native American Tribes, it was determined that relocating the project to avoid impacts on contributing elements of the culturally sensitive SELCAVCD would entail removing the site from the Salton Sea Geothermal Field where the resource needed to sustain the project exists. CEC staff knows of no potentially feasible alternative site where any of the project's significant impacts would be avoided or substantially lessened; therefore, no alternative site was fully analyzed and compared to the MBGP.

Staff considered whether a Reduced Capacity Alternative like the 77-MW BRGP could avoid or lessen any of the MBGP's significant impacts. Staff concludes that the quantities and massing of MBGP project facilities would be similar to those for a Reduced Capacity Alternative. The significant impacts of the MBGP on cultural and tribal cultural resources would not be substantially lessened by a Reduced Capacity Alternative. It is unknown if fewer wells for an alternative the size of BRGP would change the surface expressions of the mud pots and volcanoes, which are elements in the SELCAVCD. Potential impacts on biological resources would be similar to or the same as the MBGP under a Reduced Capacity Alternative.

Staff concludes that a Reduced Capacity Alternative would not avoid or substantially lessen any of the project's significant impacts (summarized under subsection "8.4 Environmental Impacts of the Project," above); therefore, this alternative was not fully analyzed and compared to the MBGP.

8.6 Alternatives Selected for Analysis and Comparison to the Project

No potentially feasible alternatives were identified that would 1) attain the key project objectives to develop a baseload renewable electrical generating facility capable of satisfying the energy resource procurement requirements under the California Public

Utilities Commission Mid-Term Reliability Decision for 2023–2026, and 2) avoid or substantially lessen any of the project's significant impacts. Therefore, no alternatives were fully analyzed and compared to the project other than the no project alternative.

CEQA provides that the no project alternative can be "the circumstance under which the project does not proceed" (Cal. Code Regs., tit. 14, § 15126.6, subd. (e)(3)(B)). Consistent with this provision, for this project it is the No Project/No Build Alternative (Alternative 1).

8.6.1 Alternative 1: No Project/No Build Alternative

As described above, the MBGP site is in a subarea of the Salton Sea KGRA called the Salton Sea Geothermal Field (CDOC 2013, Jacobs 2023a). The MBGP site would cover approximately 51 acres on an undeveloped, 160-acre parcel that is owned by the applicant. Ancillary project facilities would be constructed at locations on and off the power plant site (e.g., injection and production wells, pipelines, transmission line, and a switching station). The John L. Featherstone Geothermal Power Plant (also referred to as Hudson Ranch Power I) is on an adjacent property east of the MBGP site.

Under Alternative 1, the CEC would not issue a license to the applicant to construct and operate the MBGP. In that circumstance, BHE Renewables might continue to pursue development of a different geothermal power facility on the same property. However, the design, potential impacts, and time frame concerning a future project would be subjects of speculation. Under the No Project/No Build Alternative, the site would remain undeveloped for an unknown period. If the MBGP were not implemented the project objectives would not be attained, including the key objectives to develop a baseload renewable electrical generating facility capable of satisfying the energy resource procurement requirements under the CPUC Mid-Term Reliability Decision for 2023–2026 and subsequent decisions.

The No Project/No Build Alternative would avoid the significant impacts relating to construction and operation of the project, summarized as follows:

- **Air Quality** – This alternative would avoid construction-related air emissions from fugitive dust and exhaust from equipment use, site grading, and other soil disturbances. This alternative would avoid project operations emissions of criteria air pollutants from power plant equipment.
- **Biological Resources** – This alternative would avoid the project's potentially significant impacts on biological resources because project construction and operation would not occur. This includes impacts on plants that could be present in native habitats; and direct and indirect impacts on wildlife, including invertebrates, fish, mammals, and special-status and common bird species. Potential degradation and loss of wildlife habitats would be avoided. Temporary and permanent impacts on vegetation communities would be avoided.
- **Cultural and Tribal Cultural Resources** – No ground disturbing activities would occur under the No Project/No Build Alternative. Therefore, this alternative would

avoid discovery of and potential impacts on buried archaeological or ethnographic resources that could be encountered during ground disturbing activities. Because construction and operation of the project would not occur, this alternative would avoid impacts on the SELCAVCD and tribal cultural resources.

- **Geology, Paleontology, and Minerals** – This alternative would avoid disturbing previously undiscovered, buried paleontological resources that could be present because deep excavation and drilling activities associated with project construction would not occur.
- **Hazards, Hazardous Materials/Waste, and Wildfire** – Under this alternative, hazardous materials would not be transported to the project site for use and storage. Potential hazards to workers from handling or in the event of accidental spills would not occur. This alternative would avoid potential impacts on workers and the environment from exposure to remnant contaminated soil or groundwater that could be encountered during ground disturbing activities.
- **Land Use, Agriculture, and Forestry** – This alternative would avoid temporary disturbance or excavation of soil in areas classified as Important Farmland, including materials laydown, construction parking, and borrow pit sites. It would also avoid permanently converting approximately 6 acres classified as Important Farmland to a non-agricultural use.
- **Noise and Vibration** – This alternative would avoid potential construction noise impacts at sensitive receptors, including the Sonny Bono National Wildlife Refuge and Red Hill Marina Park, because construction of the project would not occur.
- **Visual Resources** – This alternative would avoid the potential effects of substantial light or glare that could adversely affect day or nighttime views in the area because no project structures or buildings would be built.
- **Water Resources** – This alternative would avoid potential impacts on water quality from stormwater runoff during project construction and operation. Potential impacts on groundwater quality would not occur without construction and operation of the geothermal production and injection wells. Potential impacts relating to the project's water consumption would be avoided.

8.7 Environmentally Superior Alternative

CEQA requires that an EIR identify the *environmentally superior alternative* and discuss the facts supporting that selection. Alternative 1, the No Project/No Build Alternative, is the environmentally superior alternative because it would avoid all impacts of the project by not creating any physical changes to the environment. However, Alternative 1 would not attain any of the project objectives. "If the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives" (Cal. Code Regs., tit. 14, § 15126.6, subd. (e)(2)).

This alternatives analysis shows there are no other potentially feasible alternatives that could attain the project objectives while avoiding or substantially lessening any of the

project's significant impacts. Alternative sites initially considered by the applicant are near the MBGP site because project viability depends on the geothermal resource and high heat flows in the Salton Sea Geothermal Field. CEC cultural resources staff consulted with California Native American tribal representatives on preferred distances for buffering MBGP facilities from resources, including those associated with the SELCAVCD. The preferred distance would entail relocating project facilities miles away from their proposed locations, and possibly tens of miles, which would place them several miles outside of the Salton Sea Geothermal Field. While such an alternative would avoid impacts on cultural and tribal cultural resources, it would make the MBGP infeasible and unable to meet any of the project objectives.

CEC cultural resources staff considered whether a Reduced Capacity Alternative could feasibly reduce any of the significant impacts on cultural and tribal cultural resources. Staff concluded that changing the MBGP to resemble the proposed 77-MW BRGP would not lessen impacts to any meaningful extent. And it would not avoid or substantially lessen any other significant impacts on resources evaluated in this staff assessment. Therefore, a Reduced Capacity Alternative was not included for full analysis.

No project alternatives are fully analyzed and compared to the project because none are known that could feasibly attain the project objectives while avoiding or substantially reducing any of the project's significant impacts. Therefore, the No Project/No Build Alternative remains the environmentally superior alternative.

Table 8-3 lists staff members who contributed to this Alternatives analysis.

TABLE 8-3 STAFF CONTRIBUTORS TO THE ALTERNATIVES ANALYSIS

Technical Area	Staff
Cultural and Tribal Cultural Resources	Patrick Riordan Cameron Travis Gabriel Roark, M.A.
Facility Design and Noise	Kenneth Salyphone Ardalan Sofi, Ph.D., P.E.

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Section 9

Compliance Conditions and Compliance Monitoring Plan

9 Compliance Conditions and Compliance Monitoring Plan

Joe Douglas

9.1 Introduction

The Morton Bay Geothermal Project (MBGP) Compliance COCs (COC's), including a Compliance Monitoring Plan (Compliance Plan), are established as required by Public Resources Code section 25532. The Compliance Plan provides a means for assuring that the facility is constructed, operated, and closed in compliance with public health and safety and environmental law; all other applicable laws, ordinances, regulations, and standards (LORS); and the conditions adopted by the California Energy Commission (CEC) Final Decision (Decision) on the project's Application for Certification (AFC), or otherwise required by law.

The Compliance Plan is composed of elements that:

- set forth the duties and responsibilities of the compliance project manager (CPM), the project owner or operator, delegate agencies, and others;
- set forth the requirements for handling confidential records and maintaining the compliance record;
- state procedures for settling disputes and making post-certification changes;
- state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission-approved COC's;
- establish contingency planning, facility non-operation protocols, and closure requirements; and
- establish a tracking method for the technical area COC's that contain measures required to mitigate potentially adverse project impacts associated with construction, operation, and closure below a level of significance; each technical COC also includes one or more verification provisions that describe the means of assuring that the condition has been satisfied.

9.2 Key Project Event Definitions

The following terms and definitions help determine when various COC's are implemented.

Project Certification

Project certification occurs on the day the CEC dockets its decision after adopting it at a publicly noticed Business Meeting or hearing. At that time, all CEC COC's become binding on the project owner and the proposed facility. Also at that time, the project enters the compliance phase. It retains the same docket number it had during its siting review, but the letter "C" is added at the end (for example, 19-AFC-8C) to differentiate the compliance phase activities from those of the certification proceeding.

Site Assessment and Pre-Construction Activities

The below-listed site assessment and pre-construction activities may be initiated or completed prior to the start of construction, subject to the CPM's approval of the specific site assessment or pre-construction activities.

Site assessment and pre-construction activities include the following, but only to the extent the activities are minimally disruptive to soil and vegetation and will not affect listed or special-status species or other sensitive resources:

1. the installation of environmental monitoring equipment;
2. a minimally invasive soil or geological investigation;
3. a topographical survey;
4. any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility;
5. any minimally invasive work to provide safe access to the site for any of the purposes specified in 1 through 4, above; and
6. removal of small surface structures and equipment that is minimally invasive such as sheds, trailers, and similar sized structures.

Site Mobilization and Construction

When a COC requires the project owner to take an action or obtain CPM approval prior to the start of construction, or within a period of time relative to the start of construction, that action must be taken, or approval must be obtained, prior to any site mobilization or construction activities, as defined below.

Site mobilization and construction activities are those necessary to provide site access for construction mobilization and facility installation, including both temporary and permanent equipment and structures, as determined by the CPM.

Site mobilization and construction activities include, but are not limited to:

1. ground disturbance activities like grading, boring, trenching, leveling, mechanical clearing, grubbing, and scraping;
2. site preparation activities, such as access roads, temporary fencing, trailer and utility installation, construction equipment installation and storage, equipment and supply laydown areas, borrow and fill sites, temporary parking facilities, chemical spraying, and controlled burns; and
3. permanent installation activities for all facility and linear structures, including access roads, fencing, utilities, parking facilities, equipment storage, mitigation and landscaping activities, and other installations, as applicable.

Commissioning

Commissioning activities test the functionality of the installed components and systems to ensure the facility operates safely and reliably. Commissioning provides a multistage, integrated, and disciplined approach to testing, calibrating, and proving all of the project's systems, software, and networks. For compliance monitoring purposes, examples of commissioning activities include interface connection and utility pre-testing, "cold" and "hot" electrical testing, system pressurization and optimization tests, grid synchronization, and combustion turbine "first fire" and tuning.

Start of Commercial Operation

For compliance monitoring purposes, "commercial operation" or "operation" begins once commissioning activities are complete, the certificate of occupancy has been issued, and the power plant has reached reliable steady-state electrical production. At the start of commercial operation, plant control is usually transferred from the construction manager to the plant operations manager. Operation activities can include a steady state of electrical production.

Non-Operation and Closure

Non-operation is time limited and can encompass part or all of a facility. Non-operation can be a planned event, usually for equipment maintenance or repair, or unplanned, usually the result of unanticipated events or emergencies.

Closure is a facility shutdown with no intent to restart operation. It may also be the cumulative result of unsuccessful efforts to restart over an increasingly lengthy period of non-operation. Facility closures can occur due to a variety of factors, including, but not limited to, irreparable damage and/or functional or economic obsolescence.

9.3 Roles and Responsibilities

Provided below is a generalized description of the compliance roles and responsibilities for CEC staff (staff) and the project owner for the construction and operation of the Stanton project.

Compliance Project Manager Responsibilities

The CPM's compliance monitoring and project oversight responsibilities include:

1. ensuring that the design, construction, operation, and closure of the project facilities are in compliance with the terms and conditions of the Decision;
2. resolving complaints;
3. processing post-certification project amendments for changes to the project design, operation or performance requirements, COC's, ownership or operational control, and requests for extension of the deadline for the start of construction (see COC **COM-10** for instructions on filing a Petition to Amend (PTA) or to extend a construction start date);

4. documenting and tracking compliance filings; and
5. ensuring that the compliance files are maintained and accessible.

The CPM is the central contact person for the CEC during project preconstruction, construction, operation, emergency response, and closure. The CPM will consult with the appropriate responsible parties when handling compliance issues, disputes, complaints, and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal requires CPM approval required by a condition of certification, the approval will involve appropriate CEC staff and management. All submittals must include searchable electronic versions (.pdf, MS Word, or equivalent files).

Pre-Construction and Pre-Operation Compliance Meeting

The CPM usually schedules pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. These meetings are used to assist the CEC and the project owner's technical staff in the status review of all required pre-construction or pre-operation conditions of certification, and facilitate staff taking proper action if outstanding conditions remain. In addition, these meetings shall ensure, to the extent possible, that CEC's conditions of certification do not delay the construction and operation of the plant due to last-minute unforeseen issues, or a compliance oversight. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

Energy Commission Record

The CEC maintains the following documents and information as public record, in either the Compliance file or Dockets Unit files, for the life of the project (or other period as specified):

1. all documents demonstrating compliance with any legal requirements relating to the construction, operation, and closure of the facility;
2. all Monthly and Annual Compliance Reports (MCRs, ACRs) and other required periodic compliance reports (PCRs) filed by the project owner;
3. all project-related formal complaints of alleged noncompliance filed with the CEC; and
4. all petitions for project or condition of certification changes and the resulting action by staff or the CEC.

Chief Building Official Delegation and Agency Cooperation

Public Resources Code section 25532 requires the CEC to establish a monitoring system to assure that any facility it certifies is constructed and operated in a manner consistent with law and the CEC's Decision. In carrying out these responsibilities through monitoring construction and operation of the project, the CEC has the responsibilities of the chief building official (CBO) consistent with Health and Safety Code section 18949.27 and Title

24, part 2, section 104 (commonly referred to as the California Building Code, or CBC). Staff may delegate some CBO responsibility to either an independent third-party contractor or a local building official, as per section 103.3 of part 2 of the CBC. However, staff retains CBO authority when selecting a delegate CBO (DCBO), including the interpretation and enforcement of state and local codes, and the use of discretion, as necessary, in implementing the various codes and standards. (See section 104.1 of part 2 of the CBC).

The DCBO will be responsible for the implementation of all appropriate codes, standards, and CEC requirements. The DCBO will conduct on-site (including linear facilities) reviews and inspections at intervals necessary to fulfill these responsibilities. The project owner will pay all DCBO fees necessary to cover the costs of these reviews and inspections.

Project Owner Responsibilities

Should the project be approved, the project owner is responsible for ensuring that all COCs and applicable LORS in the project Decision are satisfied. The project owner will submit all compliance submittals to the CPM for processing unless the conditions specify another recipient. The Compliance COCs regarding post-certification changes specify measures that the project owner must take when modifying the project's design, operation, or performance requirements, or to transfer ownership or operational control. Failure to comply with any of the COCs or applicable LORS may result in a notice of violation, an administrative fine, certification revocation, or any combination thereof, as appropriate.

9.4 Compliance Enforcement

The CEC's legal authority to enforce the terms and conditions of its Decision are specified in Public Resources Code sections 25534 and 25900. The CEC may amend or revoke a project certification and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Decision. The CEC's actions and fine assessments would take into account the specific circumstances of the incident(s).

Periodic Compliance Reporting

Many of the COC's require submittals in the MCRs and ACRs. All compliance submittals assist the CPM in tracking project activities and monitoring compliance with the terms and conditions of the project Decision. During construction, the project owner or an authorized agent will submit compliance reports on a monthly basis. During operation, compliance reports are submitted annually; though reports regarding compliance with various technical area COC's may be required more often (e.g. Biological Resources), and if the project is operating with a temporary permit to occupy. Further detail regarding the MCR/ACR content and the requirements for an accompanying compliance matrix are described below.

Investigation Requests and Complaint Procedures

Any person may file a Request for Investigation alleging non-compliance with the COCs, CEC regulations, or orders. Such a request shall be filed with and reviewed by the Executive Director. The provisions setting forth the Request for Investigation process can be found in Title 20, California Code of Regulations, sections 1230 through 1232.5. The Request for Investigation may result in the Executive Director bringing a complaint against the alleged violator under section 1233 and seeking administrative penalties. The California Office of Administrative Law provides on-line access to the California Code of Regulations at http://www.oal.ca.gov/.

9.5 Post-Certification Changes to the Energy Commission Decision

The project owner must petition the CEC pursuant to Title 20, California Code of Regulations, section 1769, to amend the Decision in order to modify the design, operation, or performance requirements of the project and/or the linear facilities, or to transfer ownership or operational control of the facility. It is the responsibility of the project owner to contact the CPM to determine if a proposed project change should be considered a project modification pursuant to section 1769, and the CPM will determine whether staff approval will be sufficient, or whether CEC approval will be necessary.

A project owner is required to submit a $5,000 fee for every PTA the license for a previously certified facility, pursuant to Public Resources Code section 25806(e). If the actual amendment processing costs exceed $5,000, the total petition reimbursement fees owed by a project owner will not exceed the maximum filing fee for an AFC, which is $1,050,850, adjusted annually. Current amounts for PTA fees are available at http://www.energy.ca.gov/siting/filing_fees.html. Implementation of a project modification without first securing CEC approval may result in an enforcement action including civil penalties in accordance with Public Resources Code, section 25534.

Below is a summary of the criteria for determining the type of approval process required, reflecting the provisions of Title 20, California Code of Regulations, section 1769, at the time this compliance plan was drafted. If the CEC modifies this regulation, the language in effect at the time of the requested change shall apply. Upon request, the CPM can provide sample formats of these submittals.

Amendment

The project owner shall submit a petition to amend the CEC Decision, pursuant to Title 20, California Code of Regulations, section 1769(a), when proposing modifications to the design, operation, or performance requirements of the project and/or the linear facilities. If a proposed modification results in an added, changed, or deleted COC, the changes causing noncompliance with any applicable LORS, or creates a significant environmental

impact, the petition will be processed as a formal amendment to the Decision and must be approved by the full Commission.

Change of Ownership and/or Operational Control

Change of ownership or operational control also requires that the project owner file a petition pursuant to section 1769 (b). This process requires public notice and approval by the full Commission, but does not require submittal of an amendment processing fee.

Staff-Approved Project Modification

Pursuant to section 1769(a)(3), staff shall approve a project change where staff determines the following:

1. there is no possibility that the change may have a significant effect on the environment, or the change is exempt from the California Environmental Quality Act;
2. the change would not cause the project to fail to comply with any applicable LORS; and
3. the change will not require a change to, or deletion of, a condition of certification adopted by the commission in the final decision or subsequent amendments.

Staff, in consultation with the air pollution control district where the project is located, may approve any change to a condition of certification regarding air quality, provided:

4. that the criteria in subdivisions 1759(a)(3)(A)(i) and (ii) are met; and
5. that no daily, quarterly, annual or other emission limit will be increased as a result of the change.

Once the CPM files a statement summarizing its actions taken pursuant to subdivisions Title 20, CCR section 1769(a)(1), any person may file an objection to a staff action taken pursuant to subdivisions (a)(3)(A) or (B) within 14 days of the filing of staff's statement. Any such objection must make a showing supported by facts that the change does not meet the criteria in this subdivision. Speculation, argument, conjecture, and unsupported conclusions or opinions are not sufficient to support an objection to staff approval.

If there is a valid objection to a staff action, the petition must be processed as a formal amendment to the Decision and must be considered for approval by the full Commission at a publicly noticed Business Meeting.

Staff and Project Owner Jointly Initiated Amendments

Staff and a project owner may jointly initiate an amendment to a final decision adopted pursuant to section 1769.1, provided that the purpose of the proposed amendment is to update the decision to reconcile the COCs with other legal requirements or changes to compliance protocols or methodologies, or to modify a condition that is moot, impossible, or otherwise unnecessary to avoid potentially significant effects and remain in compliance with all applicable LORS. An amendment jointly initiated by staff and the project owner

shall include the information specified in section 1769(a)(1) and be accompanied by a summary of the amendment consistent with the requirements of section 1769(a)(2). The amendment shall be considered by the commission in a manner consistent with the process set forth in section 1769(a)(4). The amendment shall not be approved by the commission unless the agreement of the project owner with the proposed amendment is reflected in the joint proposal presented to the commission for approval.

Verification Change

Pursuant to section 1770(d), a verification may be modified by the CPM, after giving notice to the project owner, if the change does not conflict with any condition of certification.

9.6 Emergency Response Contingency Planning and Incident Reporting

To protect public health and safety and environmental quality, the COC's include contingency planning and incident reporting requirements to ensure compliance with necessary health and safety practices. A well-drafted contingency plan avoids or limits potential hazards and impacts resulting from serious incidents involving personal injury, hazardous spills, flood, fire, explosions or other catastrophic events and ensures a comprehensive timely response. All such incidents must be reported immediately to the CPM and documented. These requirements are designed to protect the public, build from "lessons learned," limit the hazards and impacts, anticipate and prevent recurrence, and provide for the safe and secure shutdown and restart of the facility.

9.7 Facility Closure

The CEC cannot reasonably foresee all potential circumstances in existence when a facility permanently closes. Therefore, the closure conditions provided herein strive for the flexibility to address circumstances that may exist at some future time. Most importantly, facility closure must be consistent with all applicable CEC COCs and the LORS in effect at that time.

Prior to submittal of the facility's Final Closure Plan to the CEC, the project owner and the CPM will hold a meeting to discuss the specific contents of the plan. In the event that significant issues are associated with the plan's approval, the CPM will hold one or more workshops and/or the CEC may hold public hearings as part of its approval procedure.

With the exception of measures to eliminate any immediate threats to public health and safety or to the environment, facility closure activities cannot be initiated until the CEC approves the Final Closure Plan and Cost Estimate, and the project owner complies with any requirements the CEC may incorporate as conditions of approval of the Final Closure Plan.

9.8 Compliance Conditions of Certification

COM-1 Unrestricted Access. The project owner shall take all steps necessary to ensure that the CPM, responsible CEC staff, and delegate agencies or consultants have unrestricted access to the facility site, related facilities, project-related staff, and the records maintained on site for the purpose of conducting audits, surveys, inspections, or general or closure-related site visits. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time, whether such visits are by the CPM in person or through representatives from CEC staff, delegated agencies, or consultants.

COM-2 Compliance Record. The project owner shall maintain electronic copies of all project files and submittals on site, or at an alternative site approved by the CPM, for the operational life and closure of the project. The files shall also contain at least one hard copy of:

1. the facility's Application of Certification;
2. all amendment petitions and CEC orders;
3. all site-related environmental impact and survey documentation;
4. all appraisals, assessments, and studies for the project;
5. all finalized original and amended structural plans and "as-built" drawings for the entire project;
6. all citations, warnings, violations, or corrective actions applicable to the project, and
7. the most current versions of any plans, manuals, and training documentation required by the COC's or applicable LORS.

The CEC staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files maintained pursuant to this condition.

COM-3 Compliance Verification Submittals. Verification lead times associated with the start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification. The verification procedures, unlike the conditions, may be modified as necessary by the CPM after notice to the project owner.

A cover letter from the project owner or an authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. The cover letter subject line shall identify the project by AFC number, cite the appropriate condition of certification number(s), and give a brief description of the subject of the submittal. When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal and the condition(s) of certification applicable.

All reports and plans required by the project's COCs shall be submitted in a searchable electronic format (.pdf, MS Word or Excel, etc.) and include standard formatting elements

such as a table of contents identifying by title and page number each section, table, graphic, exhibit, or addendum. All report and/or plan graphics and maps shall be adequately scaled and shall include a key with descriptive labels, directional headings, a bar scale, and the most recent revision date.

The project owner is responsible for the content and delivery of all verification submittals to the CPM and that the actions required by the verification were satisfied by the project owner or an agent of the project owner. All submittals shall be submitted electronically by email.

COM-4 Pre-Construction Matrix and Tasks Prior to Start of Construction. Prior to construction, the project owner shall submit to the CPM a compliance matrix including only those conditions that must be fulfilled before the start of construction. The matrix shall be included with the project owner's first compliance submittal or prior to the first pre-construction meeting, whichever comes first, and shall be submitted in a format similar to the description below.

Site mobilization and construction activities shall not start until the following have occurred:

1. the project owner has submitted the pre-construction matrix and all compliance verifications pertaining to pre-construction COC's; and
2. the CPM has issued an authorization-to-construct letter to the project owner.

The deadlines for submitting various compliance verifications to the CPM allow staff sufficient time to review and comment on, and, if necessary, also allow the project owner to revise the submittal in a timely manner. These procedures help ensure that project construction proceeds according to schedule. Failure to submit required compliance documents by the specified deadlines may result in delayed authorizations to commence various stages of the project.

If the project owner anticipates site mobilization immediately following project certification, it may be necessary for the project owner to file compliance submittals prior to project certification. In these instances, compliance verifications can be submitted in advance of the required deadlines and the anticipated authorizations to start construction. The project owner must understand that submitting items required in compliance verifications prior to these authorizations is at the owner's own risk. Any approval by CEC staff prior to project certification is subject to change based upon the Decision, or amendment thereto, and early staff compliance approvals do not imply that the CEC will certify the project for actual construction and operation.

COM-5 Compliance Matrix. The project owner shall submit a compliance matrix to the CPM with each MCR and ACR. The compliance matrix shall identify:

1. the technical area (e.g., biological resources, facility design, etc.);
2. the condition number;

3. a brief description of the verification action or submittal required by the condition;
4. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.);
5. the expected or actual submittal date;
6. the date a submittal or action was approved by the Delegate Chief Building Official (DCBO), CPM, or delegate agency, if applicable;
7. the compliance status of each condition (e.g., "not started," "in progress" or "completed" (include the date)); and
8. if the condition was amended, the updated language and the date the amendment was proposed or approved.

The CPM can provide a template for the compliance matrix upon request.

COM-6 Monthly Compliance Report. The first MCR is due 30 days following the docketing of the project's Decision unless otherwise agreed to by the CPM. The first MCR shall include the AFC number and an initial list of dates for each of the events identified on the Key Events List. (The Key Events List form is found at the end of this **Compliance Conditions and Compliance Monitoring Plan** section.) During pre-construction, construction, or closure, the project owner or authorized agent shall submit an electronic searchable version of the MCR to the CPM within 10 business days after the end of each reporting month.

MCRs shall be submitted each month until construction is complete and the final certificate of occupancy is issued by the DCBO. MCRs shall be clearly identified for the month being reported. The MCR shall contain, at a minimum:

1. a summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
2. documents required by specific conditions to be submitted along with the MCR. Each of these items shall be identified in the transmittal letter, as well as the conditions they satisfy, and submitted as attachments to the MCR;
3. an initial, and thereafter updated, compliance matrix showing the status of all COC's;
4. a list of conditions that have been satisfied during the reporting period, and a description or reference to the actions that satisfied the condition;
5. a list of any submittal deadlines that were missed, accompanied by an explanation and an estimate of when the information will be provided;
6. a cumulative listing of any approved changes to COC's;
7. a listing of any filings submitted to, and permits issued by, other governmental agencies during the month;

8. a projection of project compliance activities scheduled during the next two months; the project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with COC's;
9. a listing of the month's additions to the on-site compliance file; and
10. a listing of incidents, complaints, notices of violation, official warnings, and citations received during the month; a list of any incidents that occurred during the month, a description of the actions taken to date to resolve the issues; and the status of any unresolved actions noted in the previous MCRs.

COM-7 Periodic and Annual Compliance Reports. After construction is complete, the project must submit searchable electronic ACRs to the CPM, as well as other periodic compliance reports (PCRs) required by the various technical disciplines. ACRs shall be completed for each year of commercial operation and are due each year on a date agreed to by the CPM. Other PCRs (e.g. quarterly reports or decommissioning reports to monitor closure compliance), may be specified by the CPM. The searchable electronic copies may be filed on an electronic storage medium or by e-mail, subject to CPM approval. Each ACR must include the AFC number, identify the reporting period, and contain the following:

1. an updated compliance matrix which shows the status of all COC's (fully satisfied conditions do not need to be included in the matrix after they have been reported as completed);
2. a summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
3. documents required by specific conditions to be submitted along with the ACR; each of these items shall be identified in the transmittal letter with the condition(s) it satisfies, and submitted as an attachment to the ACR;
4. a cumulative list of all post-certification changes approved by the Energy Commission or the CPM;
5. an explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
6. a listing of filings submitted to, or permits issued by, other governmental agencies during the year;
7. a projection of project compliance activities scheduled during the next year;
8. a listing of the year's additions to the on-site compliance file;
9. an evaluation of the Site Contingency Plan, including amendments and plan updates; and
10. a listing of complaints, incidents, notices of violation, official warnings, and citations received during the year, a description of how the issues were resolved, and the status of any unresolved complaints.

COM-8 Confidential Information. Any information that the project owner designates as confidential shall be submitted to the Energy Commission's Executive Director with an application for confidentiality, pursuant to Title 20, California Code of Regulations, section 2505(a). Any information deemed confidential pursuant to the regulations will remain undisclosed, as provided in Title 20, California Code of Regulations, section 2501 *et seq*.

COM-9 Annual Energy Facility Compliance Fee. Pursuant to the provisions of section 25806 (b) of the Public Resources Code, the project owner is required to pay an annually adjusted compliance fee. Current compliance fee information is available on the CEC's website at http://www.energy.ca.gov/siting/filing_fees.html. The project owner may also contact the CPM for the current fee information. The initial payment is due on the date the CEC dockets its final Decision. All subsequent payments are due by July 1 of each year in which the facility retains its certification.

COM-10 Amendments, Staff-Approved Project Modifications, Ownership/Operational Control Changes, Staff and Project Owner Jointly Initiated Amendments and Verification Changes. The project owner shall petition the CEC, pursuant to title 20, California Code of Regulations, section 1769, to modify the design, operation, or performance requirements of the project or linear facilities, or to transfer ownership or operational control of the facility. The CPM will determine whether staff approval will be sufficient, or whether Commission approval will be necessary. It is the project owner's responsibility to contact the CPM to determine if a proposed project change triggers the requirements of section 1769. Section 1769 details the required contents for a petition to amend a CEC Decision.

A project owner is required to submit a $5,000 fee for every petition to amend a previously certified facility, pursuant to Public Resources Code section 25806 (e). If the actual amendment processing costs exceed $5,000, the total PTA reimbursement fees owed by a project owner will not exceed the AFC cap of $1,050,850, adjusted annually. Current amendment fee information is available on the CEC's website at http://www.energy.ca.gov/siting/filing_fees.html.

Staff and Project Owner Jointly Initiated Amendments, and Verification Changes, are exempt from 25806(e) and, therefore, do not require a filing fee.

COM-11 Reporting of Complaints, Notices, and Citations. Prior to the start of construction or closure, the project owner shall send a letter to property owners within one mile of the project, notifying them of a telephone number to contact project representatives with questions, complaints or concerns. If the telephone is not staffed 24 hours per day, it must include automatic answering with date and time stamp recording.

The project owner shall respond to all recorded complaints within 24 hours or the next business day. The project owner shall post the telephone number onsite and make it easily visible to passersby during construction, operation, and closure. The project owner shall provide the contact information to the CPM and promptly report any disruption to

the contact system or telephone number change to the CPM, who will provide it to any persons contacting him or her with a complaint.

Within five business days of receipt, the project owner shall report, and provide copies to the CPM, all complaints, including, but not limited to, noise and lighting complaints, notices of violation, notices of fines, official warnings, and citations. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the Noise and Vibration conditions of certification. All other complaints shall be recorded on the complaint form at the end of this compliance plan. Additionally, the project owner must include in the next MCR, ACR or PCR, copies of all complaints, notices, warnings, citations and fines, a description of how the issues were resolved, and the status of any unresolved or ongoing matters.

COM-12 Emergency Response Site Contingency Plan. No less than 60 days prior to the start of construction (or other CPM-approved) date, the project owner shall submit, for CPM review and approval, an Emergency Response Site Contingency Plan (Contingency Plan). Subsequently, no less than 60 days prior to the start of commercial operation, the project owner shall update (as necessary) and resubmit the Contingency Plan for CPM review and approval. The Contingency Plan shall evidence a facility's coordinated emergency response and recovery preparedness for a series of reasonably foreseeable emergency events. The CPM may require Contingency Plan updating over the life of the facility. Contingency Plan elements include, but are not limited to:

1. a site-specific list and direct contact information for persons, agencies, and responders to be notified for an unanticipated event;
2. a detailed and labeled facility map, including all fences and gates, the windsock location (if applicable), the on and off-site assembly areas, and the main roads and highways near the site;
3. a detailed and labeled map of population centers, sensitive receptors, and the nearest emergency response facilities;
4. a description of the on-site, first response and backup emergency alert and communication systems, site-specific emergency response protocols, and procedures for maintaining the facility's contingency response capabilities, including a detailed map of interior and exterior evacuation routes, and the planned location(s) of all permanent safety equipment;
5. an organizational chart including the name, contact information, and first aid/emergency response certification(s) and renewal date(s) for all personnel regularly on-site;
6. a brief description of reasonably foreseeable, site-specific incidents and accident sequences (on- and off-site), including response procedures and protocols and site security measures to maintain twenty-four-hour site security;
7. procedures for maintaining contingency response capabilities; and

8. the procedures and implementation sequence for the safe and secure shutdown of all non-critical equipment and removal of hazardous materials and waste (see also specific conditions of certification for the technical areas of **Public Health, Waste Management, Hazards, Hazardous Materials Management, and Wildfire and Worker Safety and Fire Protection**).

COM-13 Incident-Reporting Requirements. The project owner shall notify the CPM within one hour after it is safe and feasible, of any incident at the facility that results in any of the following:

1. An event of any kind that causes a "Forced Outage" as defined in the CAISO tariff;
1. The activation of onsite emergency fire suppression equipment to combat a fire;
2. Any chemical, gas or hazardous materials release that could result in potential health impacts to the surrounding population; or create an offsite odor issue; and
3. Notification to, or response by, any off-site emergency response federal, state or local agency regarding a fire, hazardous materials release, onsite injury, or any physical or cyber security incident.

Notification shall describe the circumstances, status, and expected duration of the incident. If warranted, as soon as it is safe and feasible, the project owner shall implement the safe shutdown of any non-critical equipment and removal of any hazardous materials and waste that pose a threat to public health and safety and to environmental quality (also, see specific conditions of certification for the technical areas of **Hazards, Hazardous Materials Management and Wildfire and Waste Management**).

Within six business days of the incident, the project owner shall submit to the CPM a detailed incident report that includes, as applicable, the following information:

1. A brief description of the incident, including its date, time, and location;
2. A description of the cause of the incident, or likely causes if it is still under investigation;
3. The location of any off-site impacts;
4. Description of any resultant impacts;
5. A description of emergency response actions associated with the incident;
6. Identification of responding agencies;
7. Identification of emergency notifications made to federal, state, and local agencies;
8. Identification of any hazardous materials released and an estimate of the quantity released;
9. A description of any injuries, fatalities, or property damage that occurred as a result of the incident;
10. Fines or violations assessed or being processed by other agencies;

11. Name, phone number, and e-mail address of the appropriate facility contact person having knowledge of the event; and
12. Corrective actions to prevent a recurrence of the incident.

The project owner shall maintain all incident report records for the life of the project, including closure. After the submittal of the initial report for any incident, the project owner shall submit to the CPM copies of incident reports within 48 hours of a request.

If the project owner requests that an incident notification or report be designated as a confidential record and not publicly disclosed, the project owner shall submit copies of notices or reports with an application for confidential designation in accordance with CEC regulations.

COM-14 Non-Operation and Repair/Restoration Plans.

a. If the facility ceases operation temporarily (excluding planned and unplanned maintenance for longer than one week (or other CPM approved date), but less than three months (or other CPM-approved date), the project owner shall notify the CPM. Notice of planned non-operation shall be given at least two weeks prior to the scheduled date. Notice of unplanned non-operation shall be provided no later than one week after non-operation begins.

   For any non-operation, a Repair/Restoration Plan for conducting the activities necessary to restore the facility to availability and reliable and/or improved performance shall be submitted to the CPM within one week after notice of non-operation is given. If non-operation is due to an unplanned incident, temporary repairs and/or corrective actions may be undertaken before the Repair/Restoration Plan is submitted. The Repair/Restoration Plan shall include:

   1. Identification of operational and non-operational components of the plant;
   2. A detailed description of the repair and inspection or restoration activities;
   3. A proposed schedule for completing the repair and inspection or restoration activities;
   4. An assessment of whether or not the proposed activities would require changing, adding, and/or deleting any COC's, and/or would cause noncompliance with any applicable LORS; and
   5. Planned activities during non-operation, including any measures to ensure continued compliance with all COC's and LORS.

b. Written monthly updates (or other CPM-approved intervals) to the CPM for non-operational periods, until operation resumes, shall include:

   1. Progress relative to the schedule;
   2. Developments that delayed or advanced progress or that may delay or advance future progress;

3. Any public, agency, or media comments or complaints; and
4. Projected date for the resumption of operation.

c. During non-operation, all applicable COC's and reporting requirements remain in effect. If, after one year from the date of the project owner's last report of productive repair/restoration plan work, the facility does not resume operation or does not provide a plan to resume operation, the Executive Director may assign suspended status to the facility and recommend commencement of permanent closure activities. Within 90 days of the Executive Director's determination, the project owner shall do one of the following:

   1. If the facility has a closure plan, the project owner shall update it and submit it for CEC review and approval; or
   2. If the facility does not have a closure plan, the project owner shall develop one consistent with the requirements in this Compliance Plan and submit it for CEC review and approval.

COM-15: Facility Closure Planning. To ensure that a facility's eventual permanent closure and maintenance do not pose a threat to public health and safety and/or to environmental quality, the project owner shall coordinate with the CEC to plan and prepare for eventual permanent closure.

Final Closure Plan and Cost Estimate

a. No less than one year (or other CPM-approved date) prior to initiating a permanent facility closure, or upon an order compelling permanent closure, the project owner shall submit for CEC review and approval a Final Closure Plan and Cost Estimate, which includes any site maintenance and monitoring.

   Prior to submittal of the facility's Final Closure Plan to the CEC, the project owner and the CPM will hold a meeting to discuss the specific contents of the plan. In the event that significant issues are associated with the plan's approval, the CPM will hold one or more workshops and/or the CEC may hold public hearings as part of its approval procedure.

b. Final Closure Plan and Cost Estimate contents include, but are not limited to:

   1. a statement of specific Final Closure Plan objectives;
   2. a statement of qualifications and resumes of the technical experts proposed to conduct the closure activities, with detailed descriptions of previous power plant closure experience;
   3. identification of any facility-related installations or maintenance agreements not part of the CEC certification, designation of who is responsible for these, and an explanation of what will be done with them after closure;

4. a comprehensive scope of work and itemized budget for permanent plant closure and site maintenance activities, with a description and explanation of methods to be used, broken down by phases, including, but not limited to:
    a. dismantling and demolition;
    b. recycling and site clean-up;
    c. impact mitigation and monitoring;
    d. site remediation and/or restoration;
    e. exterior maintenance, including paint, landscaping and fencing;
    f. site security and lighting; and
    g. any contingencies.
5. a final cost estimate for all closure activities, by phases, including site
    a. monitoring and maintenance costs, and long-term equipment
    b. replacement;
6. a schedule projecting all phases of closure activities for the power plant site and all appurtenances constructed as part of the CEC-certified project;
7. an electronic submittal package of all relevant plans, drawings, risk assessments, and maintenance schedules and/or reports, including an above and below-ground infrastructure inventory map and registered engineer's or DCBO's assessment of demolishing the facility;
8. additionally, for any facility that permanently ceased operation prior to submitting a Final Closure Plan and Cost Estimate and for which only minimal or no maintenance has been done since, a comprehensive condition report focused on identifying potential hazards;
9. all information additionally required by the facility's COC's applicable to plant closure;
10. an equipment disposition plan, including:
    a. recycling and disposal methods for equipment and materials; and
    b. identification and justification for any equipment and materials that will remain on-site after closure.
11. a site disposition plan, including but not limited to proposed rehabilitation, restoration, and/or remediation procedures, as required by the conditions of certification and applicable LORS, and site maintenance activities;
12. identification and assessment of all potential direct, indirect, and cumulative impacts and proposal of mitigation measures to reduce significant adverse impacts to a less-than-significant level. Potential impacts to be considered shall include, but not be limited to:
    a. traffic;

b. noise and vibration;
c. soil erosion;
d. air quality degradation;
e. solid waste;
f. hazardous materials;
g. waste water discharges; and
h. contaminated soil;

13. identification of all current conditions of certification, LORS, federal, state, regional, and local planning efforts applicable to the facility, and
14. proposed strategies for achieving and maintaining compliance during closure;
15. updated mailing list and Listserv of all responsible agencies, potentially interested parties, and property owners within one mile of the facility;
16. identification of alternatives to plant closure and assessment of the feasibility and environmental impacts of these; and
17. description of and schedule for security measures and safe shutdown of all non-critical equipment and removal of hazardous materials and waste (see COC's **Public Health, Waste Management, Hazards, Hazardous Materials Management, and Wildfire and Worker Safety and Fire Protection**).

If the CEC-approved Final Closure Plan and Cost Estimate procedures are not initiated within one year of the plan approval date, it shall be updated and re-submitted to the CEC for supplementary review and approval. If a project owner initiates but then suspends closure activities, and the suspension continues for longer than one year, the CEC may initiate corrective actions against the project owner to complete facility closure. The project owner remains liable for all costs of contingency planning and closure.

KEY EVENTS LIST

PROJECT: Morton Bay Geothermal Project

DOCKET #: 23-AFC-01

COMPLIANCE PROJECT MANAGER: Joe Douglas

EVENT DESCRIPTION	DATE
Certification Date	
Obtain Site Control	
On-line Date	
POWER PLANT SITE ACTITIES	
Start Site Assessment/Pre-construction	
Start Site Mobilization/Construction	
Begin Pouring Major Foundation Concrete	
Begin Installation of Major Equipment	
Completion of Installation of Major Equipment	
First Combustion of Turbine	
Obtain Building Occupation Permit	
Start Commercial Operation	
Complete All Construction	
TRANSMISSION LINE ACTIVITIES	
Start Transmission Line Construction	
Complete Transmission Line Construction	
Synchronization with Grid and Interconnection	
GEOTHERMAL FLUID PIPING ACTIVITIES	
Start Geothermal Pipeline Construction and Connections	
Complete Geothermal Pipeline Construction	
WATER SUPPLY LINE ACTIVITIES	
Start Water Supply Line Construction	
Complete Water Supply Line Construction	
Start Recycled Water Supply Line Construction	
Complete Recycled Water Supply Line Construction	

COMPLAINT LOG NUMBER:_____ DOCKET NUMBER:_____

PROJECT NAME:_____

COMPLAINANT INFORMATION

NAME:_____ PHONE NUMBER:_____

ADDRESS:_____

COMPLAINT

DATE COMPLAINT RECEIVED:_____ TIME COMPLAINT RECEIVED:_____

COMPLAINT RECEIVED BY: _____ ☐ TELEPHONE ☐ IN WRITING (COPY ATTACHED)

DATE OF FIRST OCCURRENCE:_____

DESCRIPTION OF COMPLAINT (INCLUDING DATES, FREQUENCY, AND DURATION):_____

FINDINGS OF INVESTIGATION BY PLANT PERSONNEL:_____

DOES COMPLAINT RELATE TO VIOLATION OF A CEC REQUIREMENT? ☐ YES ☐ NO

DATE COMPLAINANT CONTACTED TO DISCUSS FINDINGS:_____

DESCRIPTION OF CORRECTIVE MEASURES TAKEN OR OTHER COMPLAINT RESOLUTION:_____

DOES COMPLAINANT AGREE WITH PROPOSED RESOLUTION? ☐ YES ☐ NO

IF NOT, EXPLAIN:_____

CORRECTIVE ACTION

IF CORRECTIVE ACTION NECESSARY, DATE COMPLETED:_____

DATE FIRST LETTER SENT TO COMPLAINANT (COPY ATTACHED):_____

DATE FINAL LETTER SENT TO COMPLAINANT (COPY ATTACHED):_____

OTHER RELEVANT INFORMATION:_____

"This information is certified to be correct."

PLANT MANAGER SIGNATURE:_____ DATE: _____

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Appendix A

LESA Model

APPENDIX A: LESA MODEL

As discussed earlier in **Section 5.8 "Land Use, Agriculture, and Forestry"** of this document, staff used the California Agricultural Land Evaluation and Site Assessment Model (1997) (LESA Model), a model prepared by the California Department of Conservation, as an optional tool for assessing the project's impacts on agriculture and farmland. The LESA Model helps determine whether a project's impacts to agriculture and farmland are significant by scoring "Land Evaluation" factors (types of affected soils) and "Site Assessment" factors (size of the project, availability of water resources for irrigation, amount of surrounding agriculture, and amount of surrounding protected resource lands) (Department of Conservation 1997). A project's final score provided by the LESA model helps determine whether the project's impacts to agriculture and farmland are significant. The scoring is as follows (Department of Conservation 1997):

- 0 to 39 points – Not Considered Significant
- 40 to 59 points – Considered Significant only if "Land Evaluation" and "Site Assessment" subscores are each greater than or equal to 20 points
- 60 to 79 points – Considered Significant unless either "Land Evaluation" or "Site Assessment" subscore is less than 20 points
- 80 to 100 points – Considered Significant

This section shows the calculations used when applying the LESA Model to the project.

Land Evaluation Worksheet

Land Capability Classification (LCC)[1]					
A	**B**	**C**	**D**	**E**	**F**
Soil Map Unit	**Project Acres**	**Proportion of Project Area**	**LCC**	**LCC Rating**	**LCC Score**
115-Imperial-Glenbar silty clay loams, wet	2.8	0.7	3w	60	42
114-Imperial silty clay, wet	1.2	0.3	3w	60	18
Totals	4	1			**60**

1 Land Capability Classification (LCC) indicates the suitability of a soil type for most kinds of crops. It is based on the limitations of a soil type for growing crops. Soils are rated from Class I (best for growing crops) to Class VIII (worst for growing crops) (Department of Conservation 1997). Some LCC numerical ratings are followed by letters indicating specific constraints. For example, "w" indicates that excess water in the soil is the main issue limiting crop cultivation (Land ID 2022).

Site Assessment Worksheet 1

Project Size Score		
I	**J**	**K**
LCC Classes 1 - 2	**LCC Class 3**	**LCC Classes 4 - 8**
	2.8	
	1.2	
Total	**Total**	**Total**
0 acres	4 acres	0 acres
Project Size Score	**Project Size Score**	**Project Size Score**
0	0	0

Highest Project Size Score: 0 (LCC Class III soils of fewer than 10 acres receives a score of 0)

Site Assessment Worksheet 2 – Water Resources Availability

A	**B**	**C**	**D**	**E**
Project Portion	**Water Source**	**Proportion of Project Area**	**Water Availability Score**	**Weighted Availability Score (C x D)**
All	Imperial Irrigation District Canal Water	1.0	75[1,2]	75

1 Based on Option 6 in LESA Table 5: Physical restrictions in water during drought and non-drought years.

2 Based on referenced CalMatters 2023 article.

Final LESA Scoresheet

A	B		C		D
Factor Name	**Factor Rating (0 to 100 points)**	**X**	**Factor Weighting (Total = 1.0)**	**=**	**Weighted Factor Rating**
Land Evaluation					
1. Land Capability Classification	**60**	**X**	**0.5**	**=**	**30**
Site Assessment					
1. Project Size	**0**	**X**	**0.15**	**=**	**0**
2. Water Resource Availability	**75**	**X**	**0.15**	**=**	**11.25**
3. Surrounding Agricultural Lands	**90**	**X**	**0.15**	**=**	**13.5**
4. Protected Resource Lands	**0**	**X**	**0.05**	**=**	**0**
Total LESA Score					**54.75**

The project scores approximately 54.75 points, falling in the scoring category of 40 to 59 points, which is significant if, as in this case, the "Land Evaluation" and "Site Assessment" subscores are each greater than or equal to 20 points. In this case, they are each greater than 20 points, so **impacts are significant**.

Appendix A: References

CalMatters 2023 – Bland, Alastair. "Growers Brace to Give Up Some Colorado River Water". CalMatters, January 17, 2023. Accessed on April 3, 2024. Accessed online at: https://calmatters.org/environment/2023/01/colorado-river-water/

Department of Conservation 1997 – State of California Department of Conservation. California Agricultural Land Evaluation and Site Assessment Model Instruction Manual. Adopted 1997. Accessed on February 29, 2024. Accessed online at: https://www.conservation.ca.gov/dlrp/Pages/qh_lesa.aspx

Land ID 2022 – Land ID. "Everything You Need to Know About Land Capability Classification". Land ID Blog, July 21, 2022. Accessed on 6/3/2024. Accessed online at: https://id.land/blog/everything-you-need-to-know-about-land-capability-classification

Appendix B

Key Observation Point Evaluation Worksheets

APPENDIX B: KEY OBSERVATION POINT EVALUATION WORKSHEETS
Summary Sheet for Worksheet Tables

Key Observation Point No. 1 - Rock Hill Summit

LANDSCAPE			
Table 3 LANDSCAPE CHARACTER	Aesthetic Aspect		See attached Table 3.
	Perceptual Aspect		
	Basic Design Element		
	Landscape	**Rating**	Write the rating selected in the attached Table 4.
Table 4 UNITY	Rarity	Low to Moderate	
	Detractors	Moderate	
	Distinctiveness	Low to Moderate	
	Diversity	Moderate to High	
	Integrity	Moderate to High	
	Rating	**Checkbox**	Check (√) the rating selected in the attached Tables 5 and 6.
Table 5 PUBLIC VIEW	High		
	Moderate		
	Low	√	
	None		
Table 6 VISIBILITY	Dominant		
	High		
	Moderate to High	√	
	Moderate		
	Low to Moderate		
	Low		

PROJECT PROMINENCE			
Table 7 Basic Design Element Contrast			
Basic Design Element	**Rating**	**Weight**	**Points**
Color	Strong = 3	x 3	3
	Moderate = 2		
	Weak = 1		
	None = 0		
Form	Strong = 3	x 2	2
	Moderate = 2		
	Weak = 1		
	None = 0		
Line	Strong = 3	x 1	1
	Moderate = 2		
	Weak = 1		
	None = 0		
Texture	Strong = 3	x 1	1
	Moderate = 2		
	Weak = 1		
	None = 0		
		Maximum 21 points	7

Table 8 SCALE DOMINANCE				
Rating				**Points**
Dominant	The project is the major object in the landscape and occupies a large part of the landscape.			12
Codominant	The project is one of the major objects in the landscape or is the major object or area in a panoramic landscape.			8
Subordinate	The project is of significant size but occupies a minor part of the landscape.			4
Insignificant	The project is a small object occupying an exceedingly small area in the landscape.			0
		Single highest points	Maximum 12 points	4

Table 9 SPATIAL DOMINANCE				
Category	**Rating**	**Single Highest Rating**		**Points**
Spatial composition of the landscape.	prominent	Dominant 2-3 categories rated prominent.		6
	significant			
	inconspicuous	**Codominant** 1 category rated prominent, or 2 categories rated significant.		4
Spatial position of the project.	prominent			
	significant			
	inconspicuous	Subordinate 1 category rated significant.		2
Backdrop to the project.	prominent			
		Insignificant All categories rated inconspicuous.		0
	inconspicuous			
		Single highest points	Maximum 6 points	4

Table 10 PROJECT PROMINENCE RATING	
Total Points	**Rating**
32-39	Severe
24-31	Strong
16-23	Moderate
8-15	**Weak**
0-7	Negligible
	Rating ≡ Weak

VISUAL ABSORPTION CAPABILITY			
Table 11 CAPABIITY **Table 12 ABSORPTION**	**Rating**	**Checkbox**	The existing landscape capability to absorb the physical change by the proposed project without an alteration to its landscape character.
	High		
	Moderate		
	Low	**√**	

Table 13 MAGNITUDE OF CHANGE		
		Checkbox
Dominant	Project commands or controls the view in the landscape.	
Prominent	Project stands out or is striking in the view in the landscape.	
Conspicuous	Project is clearly visible and noticeable in the view in the landscape.	
Apparent	Project visible or evident in the view in the landscape.	**√**
Unobtrusive	Project indistinct or not obvious in the view in the landscape.	

Table 14 VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OF SITE AND ITS SURROUNDINGS		
CEQA Guidelines Level of Effect on the Environment	Significant Effect	
	Less Than Significant Effect	**√**

Key Observation Point Evaluation Tables
Full Evaluation Worksheet Tables Displayed

Key Observation Point No. 1

Table 3 LANDSCAPE CHARACTER

Aesthetic	**Description**								Check (√) the description that best describes the aspect of the landscape.
Balance	harmonious		balanced	√	discordant		chaotic		
Complexity	uniform		simple	√	diverse		complex		
Dynamic	sweeping		spreading	√	disperse		channeled		
Enclosure	expansive		open	√	enclosed		constrained		
Pattern	formal		organized		regular	√	random		
Perceptual									
Pleasure	beautiful		attractive		pleasant	√	unpleasant		nasty
Security	intimate		comfortable		safe	√	unsettling		threatening
Stimulus	inspiring		challenging		interesting		bland	√	monotonous
Tranquility	inaccessible		remote		vacant	√	peaceful		busy
Basic Design Element									
Color	monochrome		muted	√	colorful		garish		The basic design elements are the source of visual contrast in the landscape that an individual sees and responds to when viewing a space.
Form	angular	√	curvilinear		horizontal		rounded		
Line	straight	√	curved		vertical		horizontal		
Texture	smooth		textured	√	rough		very rough		
Scale	intimate		small		large	√	vast		

Adapted from Carys Swanwick, "Landscape Character Assessment Guidance for England and Scotland," prepared for The Countryside Agency and Scottish Natural Heritage, 2002, pp. 30-36.

Table 4 UNITY

Landscape	**Rating**					**Guidance**
	High	**Moderate to High**	**Moderate**	**Low to Moderate**	**Low**	
Rarity	rare			√	common	Is this landscape unique or familiar in the region or state?
Detractors	many		√		few	Are there man-made and/or natural landscape features out of place?
Distinctiveness	distinct			√	indistinct	Is it easy to remember this landscape? Are patterns dramatic or take detecting?
Diversity	orderly	√			muddled	Is there a recognizable order to the landscape features or are too many patterns overlapping?
Integrity	whole	√			remnant	What patterns in the landscape are evident? Are sections missing and to what extent?

Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 36.

Table 5 PUBLIC VIEW	
Rating	
High	
	Public view includes areas where the aesthetic value is protected by federal, state, county or city, law, ordinance, regulation, or standard. Public view includes federal, state, county, city designated areas of aesthetic, cultural, and recreational claim, such as: a park, outdoor recreation area, etc.; coastal or forest reserve, open space preserve, urban green space, etc.; scenic overlook, scenic river, scenic trail, etc.; historic building, district, or site; a site having a cultural resource. Public view includes a federal or state designated scenic byway, highway, or road; designated scenic highway or road of regional importance; a segment of travel route, such as a road, rail line, pedestrian and equestrian trail, bicycle path near a designated area of aesthetic claim and leading directly to it. View approaching an area of aesthetic, cultural, and recreational claim that may be closely related to the appreciation of the aesthetic, cultural, and recreational significance at that designation. Public view includes an urban residential use area and segment of road that serves as the primary access route to it.
Moderate	
	Public view includes undesignated but popularly used or appreciated area of aesthetic, cultural, and recreational claim of significance in the region. Public view includes a highway or road locally designated as a scenic route and of importance only to the local population, or informally designated as such in road atlases, road maps, and tour book guides. Public view includes segments of travel routes, such as roads, pedestrian and equestrian trails, bicycle paths that are near and are the primary access to a popularly used undesignated area important for their aesthetic, cultural, or recreational claim. Public view includes a segment of travel route near a designated area of aesthetic claim serving as a secondary access route to the area. Public view includes a rural residential use area and segment of road that serves as the primary access route to it within one mile. Public view includes a maintained religious facility or cemetery.
Low	
√	Public view includes an agricultural, commercial, industrial, manufacturing, research and development intensive land use area. Public view includes a small aggregation of dwellings.
None	
	No public view.
Adapted from Aspen Environmental Group, "Final Environmental Impact Report Tranquillon Ridge Oil and Gas Development Project" prepared for County of Santa Barbara Planning and Development. Santa Barbara, CA, April 2008, Vol. 1, pp. 5.13-5-6, and "Final Environmental Impact Report Southern California International Gateway Project," Appendix B Aesthetics Visual Resource Methodology, Los Angeles Harbor Department, Los Angeles, CA, March 2013.	

Table 6 VISIBILITY	
Rating	
Dominant Dominates view because project would fill most of visual field for views in its general direction. Stark contrast in form, line, color, texture, luminance, or motion may contribute to view dominance.	An object with strong visual contrast that is of such enormous size that it occupies most of the visual field, and views of it cannot be avoided except by turning the head greater than 45 degrees from a direct view of the object. The object is the major focus of visual attention, and its large apparent size is a major factor in its view dominance. In addition to size, contrast in form, line, color, and texture, bright light sources, and moving objects associated with the project may contribute substantially to drawing viewer attention. The visual prominence of the project detracts noticeably from views of other landscape components.
High Strongly attracts visual attention of views in general direction of project. Attention may be drawn by stark contrast in form, line, color, or texture, luminance, or motion.	An object that is not of enormous size, but contrasts with the surrounding landscape components so strongly that it is a major focus of visual attention, drawing viewer attention immediately, and tending to hold viewer attention. In addition to stark contrast in form, line, color, and texture, bright light sources, and moving objects associated with the project may contribute substantially to drawing viewer attention. The visual prominence of project interferes noticeably with views of nearby landscape components.
Moderate to High √ Plainly visible, could not be missed by casual observer, but does not strongly attract visual attention, or dominate view because of apparent size, for views in general direction of project.	An object that is obvious and with enough size or contrast to compete with other landscape components, but with insufficient visual contrast to strongly attract visual attention and insufficient size to occupy most of the observer's visual field.
Moderate Visible after brief glance in general direction of project and unlikely to be missed by casual observer.	An object that can be easily detected after a brief look and would be visible to most casual observers, but without enough size or contrast to compete with major landscape components.
Low to Moderate Visible when scanning in general direction of project; otherwise, likely to be missed by casual observer.	An object that is exceedingly small and/or faint, but when the observer is scanning the horizon or looking more closely at an area can be detected without extended viewing. A casual observer could sometimes notice it; however, most people would not notice it without some active looking.
Low Visible only after extended, close viewing; otherwise, invisible.	An object that is near the extreme limit of visibility. A person who was not aware of it in advance and looking for it could not see it. Even under those circumstances, the object can only be seen after looking at it closely for an extended period.
Adapted from R.G. Sullivan, L.B. Kirchler, T. Lahti, S. Roche, K. Beckman, B. Cantwell, P. Richmond, "Wind Turbine Visibility and Visual Impact Threshold Distances in Western Landscapes," University of Chicago Argonne, LLC submitted to the National Association of Environmental Professionals 37th Annual Conference Proceedings, Portland, Oregon, May 21-24, 2012, p. 17.	

Table 7 BASIC DESIGN ELEMENT CONTRAST				
Element	**Rating[1]**	**Weight**	**Points**	
Color	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 3	3	Color is "the light-reflecting qualities of a project's surface (for example, dark or light, blue or gray) in relation to background colors."[2] "Colors that harmonize well seem to belong together and produce pleasing visual effects. Colors that do not harmonize are disturbing to the viewer."[3] Contrast in color depends on the exterior surface degree of lightness or darkness, gradation or variety of a color, the degree of saturation or brilliance of a color in the project to those that continue to exist in the landscape.
Form	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 2	2	Form is "the configuration and outline of the project in terms of masses, patterns, and linear elements. For example, a structure may have a bulky, vertical, geometric silhouette which contrasts with an irregular horizontal landscape of rolling hills."[4] Forms exist in three dimensions (height, length, width). For instance, the shape is a square its form is a cube. Forms that are bold, regular, solid, or vertical tend to prevail in the landscape. Contrast in form depends on how alike the form(s) of the project is to those that continue to exist in the landscape.
Line	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 1	1	"Line is the path, real or imagined that the eye follows when perceiving abrupt differences when objects are aligned in a one-dimensional sequence."[5] "Line in the landscape is created by the edge between two materials, the outline or silhouette of a form, or a long linear feature."[6] Properties of lines include: straight, diagonal, curve, vertical, horizontal. Contrast in line depends on edge types and interruption, or introduction of edges, bands, and silhouette lines in the project to those that continue to exist in the landscape.
Texture	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 1	1	Texture is "the aggregation of small forms or color mixtures into a continuous surface pattern; the aggregated parts are enough that they do not appear as discrete objects in the composition of the scene."[7] "Details of the surface pattern, as in smooth polished metal surfaces versus the rough, uneven textures of the foliage of trees and bushes"[8] Contrast in texture depends on the relative dimensions of the surface variations from large to small, spacing of surface variations, and the degree of uniform recurrence and symmetrical arrangement of the surface variation in the project to those that continue to exist in the landscape.
	Overall Rating[9]		+	
	Maximum 21 points		7	

Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, CA, 1979.

[1] **Strong** — the project contrast demands attention will not be overlooked and is dominant in the landscape. **Moderate** — the project contrast begins to attract attention and begins to dominate the characteristic landscape. **Weak** — the project contrast can be seen but does not attract attention. **None** — the project contrast is not visible or perceived. (U.S. Department of Interior Bureau of Land Management Manual 8431-Visual Resources Contrast Rating, January 17, 1986.)

[2] Stephen R.J. Sheppard, *Visual Simulation A User's Guide For Architects, Engineers, And Planners*, Van Nostrand Reinhold, New York, 1989, p. 46.

[3] U.S. Department of Transportation Federal Highway Administration, "A Guide to Visual Quality in Noise Barrier Design," Chapter 3. Visual Design Principles, n.d.

[4] Sheppard, p. 46.

[5] U.S. Department of Interior Bureau of Land Management Manual 8431-1 Visual Resources Contrast Rating, January 17, 1986.

[6] Gail Hansen, "Basic Principles of Landscape Design." Florida Cooperative Extension Service Institute of Food and Agricultural Science, University of Florida, Gainesville, Florida, July 2010.

[7] U.S. Department of Interior Bureau of Land Management Manual 8431-1 Visual Resources Contrast Rating, January 17, 1986.

[8] Sheppard, p. 47.

[9] Overall Rating is for descriptive purpose: Strong — 1-3 ratings Strong or 3 ratings Moderate; Moderate — 1-2 ratings Moderate with no higher ratings; Weak — 1-3 ratings Weak with no higher ratings; None — all ratings None.

Table 8 SCALE DOMINANCE				
Rating				**Points**
Dominant	The project is the major object in the landscape and occupies a large part of the landscape.			12
Codominant	The project is one of the major objects in the landscape or is the major object or area in a panoramic landscape.			8
Subordinate	The project is of significant size but occupies a minor part of the landscape.			4
Insignificant	The project is a small object occupying an exceedingly small area in the landscape.			0
		Single highest points	Maximum 12 points	4
Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1979.				

Table 9 SPATIAL DOMINANCE

Category			Single Highest Rating
Spatial composition of the landscape	"[T]he arrangement of objects and voids in the landscape can be categorized by their spatial composition .... Some compositions, especially those which are distinctly focal, enclosed, or feature-oriented, are more vulnerable to modifications than others, depending upon how strongly the spatial configuration draws the eye to certain locations."[1]		**Dominant** 2-3 categories rated prominent = 6 points **Codominant √** 1 category rated prominent, or 2 categories rated significant = 4 points **Subordinate** 1 category rated significant = 2 points **Insignificant** All categories rated inconspicuous = 0 points
	Rating	**Description**	
	prominent	Feature[2], Focal[2], or Enclosed[2] landscape.	
	significant	Panoramic,[2] or weak focal, feature or enclosed landscape.	
	inconspicuous	Canopied,[2] indistinct or obscured landscape.	
Spatial position of the project	"Spatial position of the project in relation to the three-dimensional arrangement of objects and voids in the landscape. Important spatial aspects of the project include relationship to the skyline, location in topographic spaces such as focal valleys or broad plains, and position with regard to streetscapes and architectural arrangements."[3]		
	Rating	**Description**	
	prominent	Interfluve,[4] High Level,[4] High Slope,[4]	
	significant	Low Level,[4] Lowslope,[4] Midslope[4]	
	inconspicuous	Basin Floor,[4] Footslope,[4] Toeslope[4]	
Backdrop to the project	"[T]he backdrop against which an object is seen affects its visual contrast. Modifications seen against the sky or water are usually more prominent than against a land backdrop."[5]		
	Rating	**Description**	
	prominent	All or a significant part of the project will be seen against sky or water.	
	inconspicuous	All or a significant part of the project will be seen against land.	
	Single highest points	Maximum 6 points	4

Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1979.

[1] U.S. Department of Interior Bureau of Land Management Manual H-8431-1 Visual Resources Contrast Rating, January 17, 1986.

[2] **Canopied** — landscape where features overhead (above eye level) create a canopy or ceiling. **Enclosed** — a space, large or small surrounded by continuous grouping of objects creating walls and floor. It may have a large vertical dimension, but typically a restricted horizontal one. **Feature** — landscape dominated by a feature or a group of objects in the distance to which the eye is drawn. **Focal** — converging lines in the landscape or progressions of aligned objects lead the eye to a focal point in the landscape. **Panoramic** — a broad horizontal composition. Little or no sense of boundary restriction; no apparent limit to the view. Foreground or middle ground objects do not substantially block viewing of background objects. (U.S. Department of Interior Bureau of Land Management Manual H-8431-1 Visual Resources Contrast Rating, January 17, 1986.)

[3] Stephen R.J. Sheppard, *Visual Simulation A User's Guide For Architects, Engineers, And Planners*, Van Nostrand Reinhold, New York, 1989, p. 46.

[4] **Basin Floor** — nearly level to gently sloping, bottom surface of an intermontane basin. **Footslope** — the gently inclined hillslope at the foot of a hill. **High Level** — level top of plateau. **High Slope** — geomorphic part that forms the uppermost inclined surface at the top of a slope (e.g., shoulder slope, upper slope). **Interfluve** — linear top of ridge, hill or mountain. **Low Level** — valley floor, or shoreline being the former position of an alluvial plain, lake, or shore. **Lowslope** — inner gently inclined surface at the base of a slope. Surface profile is generally concave and a transition between midslope or backslope, and toeslope. **Midslope** — intermediate slope position between high and low (e.g., middle slope). (Adapted from T. Liang [1951]; J.B. Dalrymple, R.J. Blong, and A. Conacher. [1968])
Toeslope — the gently inclined surface at the base of a hillslope. Toeslope in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors. (USDA Soil Survey Manual Handbook No. 18, issued March 2017 as amended February 2018).

[5] U.S. Department of Interior Bureau of Land Management Manual H-8431-1.

Table 11 CAPABILITY							
Category	For each category check (√) the rating that best describes the existing landscape.						
		Rating					
		High		**Moderate**		**Low**	
Topography		High amount of topographic diversity and variety.		Moderate amount of topographic diversity and variety.		Low amount of topographic diversity and variety.	√
Land Use Pattern	If project in rural landscape	Small natural or vegetated areas. Man-made structures dominant in the view.		Natural areas of local significance. Man-made structures widespread but not dominant in the view.		Remote natural areas of regional significance. Man-made structures and features limited and scattered.	√
	If project in urban landscape	Developed areas including commercial development. Large-scale infrastructure or structures may be common and more dominant.		Suburban or mostly developed areas with components of local importance. Large-scale infrastructure or structures may be visible but not dominant.		Clustered development surrounded by rural scattered development. Large-scale infrastructure or structures limited and scattered.	
Visual Variety		Landscape exhibits a high degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit high degree of variety in landforms and vegetation.		Landscape exhibits a moderate degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit moderate variety in landforms and vegetation.		Landscape exhibits a low degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit minimal variety in landforms and vegetation.	√
Major Focal Points or Features		Focal points or features in the viewshed that are either natural or man-made, commonly found, minimal local importance/value, or contribute little to the character of the landscape or are indistinct.	√	Focal points or features in the viewshed that are either natural or man-made, somewhat commonly found, local importance/value, or make a minor contribution to the character of the landscape.		Focal points or features in the viewshed that are either natural or man-made and are unusual or rare, regional importance/value, or make a major contribution to the character of the landscape or are somewhat distinctive.	
Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 17, and L. Blocker, T. Slider, J. Ruchman, J. Mosier, L. Kok, J. Silbemagle, J. Beard, D. Wagner, G. Brogan, D. Jones, N. Laughlinn, L. Anderson, "Landscape Aesthetic (AH 701-i) - Visual Absorption Capability (Appendix C)," United States Department of Agriculture Forest Service, 1995, pp. C-1-C-8.							

Table 12 ABSORPTION	
Circle the applicable rating for the proposed project in the existing landscape; High = H, Moderate = M, Low = L.	
Exposure	**Rating**
What is the level of exposure of the project in the landscape? The higher the level of exposure the lower the absorption.	H M (L)
What is the intensity of the observation of the project? The more the project is observed from certain intensive land uses the lower its absorption (e.g., view from a densely populated residential area versus a heavy manufacturing area).	H (M) L
What is the view distance to the project? The farther the viewing distance to the project from the vantage point the lower its exposure the higher its absorption. Is the project more than three miles away?	H (M) L
What is the project distance from an urban skyline or a natural skyline (e.g., high-rise buildings or a mountain range against a backdrop of sky)? The closer the project is to an urban or natural skyline the lower its absorption.	(H) M L
What is the project topographic position in the landscape? As the project position increases its absorption decreases (e.g., toeslope to summit).	(H) M L
Focal Point	
Is the project near a focal point in the landscape? A focal point is a converging of lines in the landscape or progressions of aligned objects that lead the eye to a point. A focal point gives the viewer something interesting to look at in the view. The closer the project is to a focal point, the greater viewer scrutiny, the lower the absorption.	(H) M L
Does the edge(s) in the landscape have a diverse background but have the propensity to become a focal point? An edge is a transitional linear place where one space or landscape becomes part of another. An edge has a high absorption due to a diverse background, a low absorption due to the propensity to become a focal point (e.g., city meets country, a woodland edge, an alpine tree line, coastline).	(H) M L
Trees & Vegetation	
Are trees and vegetation in the landscape missing, deficient, or uniform? The greater the density of trees and vegetation, the greater the coverage, the greater the capacity of an area to absorb physical change.	H M (L)
What is the type(s) of tree(s) and vegetation in the landscape? Tree and vegetation types vary the absorption of the physical change. A uniformly tall, dense stand of trees has screening ability. Vegetation types such as evergreen shrubs and similar have greater absorption than dwarf shrubs, ornamental grasses, and grass-like plants. Trees and vegetation can provide high absorption in the foreground but lower absorption in the background.	H M (L)
Disturbed Surface Area	
What is the period of time to restore the project disturbed surface area to its pre-construction activity condition? The longer the time to restore the disturbed area to its undisturbed original condition, the lower the absorption; 1 year = high, 2 to 3 years = moderate, 3 years or more = low.	H (M) L
Adapted from S. Amir, E. Gidalizon, "Expert-based method for the evaluation of visual absorption capacity of the landscape*," Journal of Environmental Management, 1990, Vol. 30, pp. 251-263, and W.C. Yeomans, "A Proposed Biophysical Approach to Visual Absorption Capability (VAC),[1]" Pacific Southwest Forest and Range Experimental Station, Berkeley, California, 1979 submitted to the National Conference on Applied Techniques for Analysis and Management of Visual Resource, Incline Village, Nevada, April 23-25, 1979, pp. 172-181.	

Table 13 MAGNITUDE OF CHANGE				
Dominant	**Prominent**	**Conspicuous**	**Apparent**	**Unobtrusive**
Project commands or controls the view in the landscape.	Project stands out or is striking in the view in the landscape.	Project is clearly visible and noticeable in the view in the landscape.	Project visible or evident in the view in the landscape.	Project indistinct or not obvious in the view in the landscape.
Project causes a very large alteration to the landscape or features within the landscape such that there is a fundamental change from the existing physical environment.	Project causes a large alteration to the landscape or features within the landscape such that there is an unmistakable change from the existing physical environment.	Project causes a moderate alteration to the landscape or features within the landscape such that there is a distinct change from the existing physical environment.	Project causes a small alteration to the landscape or features within the landscape such that there is a perceptible change from the existing physical environment.	Project causes a very small alteration to the landscape, or features within the landscape such that there is a de minimis change from the existing physical environment.
Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 20.				

Table 14 VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OF SITE AND ITS SURROUNDINGS							
Landscape		**Project Prominence**		**Visual Absorption Capability**	**Magnitude Of Change**		**CEQA Guidelines Level Of Effect On The Environment** (See Table 15)
Table	**Rating**	**Rating**		**Rating**			
Landscape Character	See Table 3	Severe		High	Dominant		Significant Effect
Unity	See Table 4	Strong			Prominent		
Public View	**Low**	Moderate		Moderate	Conspicuous		
Visibility	**Moderate to High**	**Weak**	√	Low	**Apparent**	√	Less Than Significant Effect
		Negligible			Unobtrusive		

Table 15 CEQA GUIDELINES LEVEL OF EFFECT ON THE ENVIRONMENT

Significant Effect on the Environment "means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic and aesthetic significance." (14 CCR § 15382) (Pub. Res. Code § 21060.5, 14 CCR § 15360) The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, noncompliance with which means the effect will normally be determined to be significant by the [lead] agency...." (14 CCR § 15064.7[a])

Less Than Significant Effect with Mitigation Incorporated. The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "... but (1) revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed [CEQA environmental document (e.g., Negative Declaration) is] released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and (2) there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment." (Pub. Res. Code § 21064.5, 14 CCR § 15369.5) (Pub. Res. Code § 21002)

Less Than Significant Effect. The physical change by the proposed project to the existing physical environment does not reach the threshold of significance "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, ... compliance with which means the effect normally will be determined to be less than significant." (14 CCR § 15064.7[a])

Key Observation Point Evaluation Worksheet
Summary Sheet for Worksheet Tables

Key Observation Point No. 2 - Red Hill Marina Park

LANDSCAPE			
Table 3 LANDSCAPE CHARACTER	Aesthetic Aspect		See attached Table 3.
	Perceptual Aspect		
	Basic Design Element		
	Landscape	**Rating**	Write the rating selected in the attached Table 4.
Table 4 UNITY	Rarity	Low to Moderate	
	Detractors	Moderate	
	Distinctiveness	Low to Moderate	
	Diversity	Moderate	
	Integrity	Moderate	
	Rating	**Checkbox**	Check (√) the rating selected in the attached Tables 5 and 6.
Table 5 PUBLIC VIEW	High		
	Moderate		
	Low	√	
	None		
Table 6 VISIBILITY	Dominant		
	High		
	Moderate to High		
	Moderate	√	
	Low to Moderate		
	Low		

PROJECT PROMINENCE			
Table 7 Basic Design Element Contrast			
Basic Design Element	**Rating**	**Weight**	**Points**
Color	Strong = 3	x 3	0
	Moderate = 2		
	Weak = 1		
	None = 0		
Form	Strong = 3	x 2	2
	Moderate = 2		
	Weak = 1		
	None = 0		
Line	Strong = 3	x 1	1
	Moderate = 2		
	Weak = 1		
	None = 0		
Texture	Strong = 3	x 1	1
	Moderate = 2		
	Weak = 1		
	None = 0		
		Maximum 21 points	4

Table 8 SCALE DOMINANCE				
Rating				**Points**
Dominant	The project is the major object in the landscape and occupies a large part of the landscape.			12
Codominant	The project is one of the major objects in the landscape or is the major object or area in a panoramic landscape.			8
Subordinate	The project is of significant size but occupies a minor part of the landscape.			4
Insignificant	The project is a small object occupying an exceedingly small area in the landscape.			0
		Single highest points	Maximum 12 points	0

Table 9 SPATIAL DOMINANCE				
Category	**Rating**	**Single Highest Rating**		**Points**
Spatial composition of the landscape.	prominent	Dominant 2-3 categories rated prominent.		6
	significant			
	inconspicuous	Codominant 1 category rated prominent, or 2 categories rated significant.		4
Spatial position of the project.	prominent			
	significant			
	inconspicuous	**Subordinate** 1 category rated significant.		2
Backdrop to the project.	prominent			
		Insignificant All categories rated inconspicuous.		0
	inconspicuous			
		Single highest points	Maximum 6 points	2

Table 10 PROJECT PROMINENCE RATING	
Total Points	**Rating**
32-39	Severe
24-31	Strong
16-23	Moderate
8-15	Weak
0-7	**Negligible**
	Rating ≡ Negligible

VISUAL ABSORPTION CAPABILITY			
Table 11 CAPABILITY **Table 12 ABSORPTION**	**Rating**	**Checkbox**	The existing landscape capability to absorb the physical change by the proposed project without an alteration to its landscape character.
	High	**√**	
	Moderate		
	Low		

Table 13 MAGNITUDE OF CHANGE		
		Checkbox
Dominant	Project commands or controls the view in the landscape.	
Prominent	Project stands out or is striking in the view in the landscape.	
Conspicuous	Project is clearly visible and noticeable in the view in the landscape.	
Apparent	Project visible or evident in the view in the landscape.	**√**
Unobtrusive	Project indistinct or not obvious in the view in the landscape.	

Table 14 VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OF SITE AND ITS SURROUNDINGS		
CEQA Guidelines Level of Effect on the Environment	Significant Effect	
	Less Than Significant Effect	**√**

Key Observation Point Evaluation Tables
Full Evaluation Worksheet Tables Displayed

Key Observation Point No. 2

Table 3 LANDSCAPE CHARACTER											
Aesthetic	**Description**										Check (√) the description that best describes the aspect of the landscape.
Balance	harmonious		balanced		discordant	√	chaotic				
Complexity	uniform		simple		diverse	√	complex				
Dynamic	sweeping		spreading		disperse	√	channeled				
Enclosure	expansive		open	√	enclosed		constrained				
Pattern	formal		organized	√	regular		random				
Perceptual											
Pleasure	beautiful		attractive		pleasant	√	unpleasant		nasty		
Security	intimate		comfortable		safe	√	unsettling		threatening		
Stimulus	inspiring		challenging		interesting		bland	√	monotonous		
Tranquility	inaccessible		remote		vacant	√	peaceful		busy		
Basic Design Element											
Color	monochrome		muted	√	colorful		garish		The basic design elements are the source of visual contrast in the landscape that an individual sees and responds to when viewing a space.		
Form	angular	√	curvilinear		horizontal		rounded				
Line	straight		curved		vertical	√	horizontal				
Texture	smooth		textured		rough	√	very rough				
Scale	intimate		small		large	√	vast				

Adapted from Carys Swanwick, "Landscape Character Assessment Guidance for England and Scotland," prepared for The Countryside Agency and Scottish Natural Heritage, 2002, pp. 30-36.

Table 4 UNITY						
Landscape	**Rating**					**Guidance**
	High	**Moderate to High**	**Moderate**	**Low to Moderate**	**Low**	
Rarity	rare			√	common	Is this landscape unique or familiar in the region or state?
Detractors	many		√		few	Are there man-made and/or natural landscape features out of place?
Distinctiveness	distinct			√	indistinct	Is it easy to remember this landscape? Are patterns dramatic or take detecting?
Diversity	orderly		√		muddled	Is there a recognizable order to the landscape features or are there too many patterns overlapping?
Integrity	whole		√		remnant	What patterns in the landscape are evident? Are sections missing and to what extent?

Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 36.

Table 5 PUBLIC VIEW	
Rating	
High	
	Public view includes areas where the aesthetic value is protected by federal, state, county or city, law, ordinance, regulation, or standard. Public view includes federal, state, county, city designated areas of aesthetic, cultural, and recreational claim, such as: a park, outdoor recreation area, etc.; coastal or forest reserve, open space preserve, urban green space, etc.; scenic overlook, scenic river, scenic trail, etc.; historic building, district, or site; a site having a cultural resource. Public view includes a federal or state designated scenic byway, highway, or road; designated scenic highway or road of regional importance; a segment of travel route, such as a road, rail line, pedestrian and equestrian trail, bicycle path near a designated area of aesthetic claim and leading directly to it. View approaching an area of aesthetic, cultural, and recreational claim that may be closely related to the appreciation of the aesthetic, cultural, and recreational significance at that designation. Public view includes an urban residential use area and segment of road that serves as the primary access route to it.
Moderate	
	Public view includes undesignated but popularly used or appreciated area of aesthetic, cultural, and recreational claim of significance in the region. Public view includes a highway or road locally designated as a scenic route and of importance only to the local population, or informally designated as such in road atlases, road maps, and tour book guides. Public view includes segments of travel routes, such as roads, pedestrian and equestrian trails, bicycle paths that are near and are the primary access to a popularly used undesignated area important for their aesthetic, cultural, or recreational claim. Public view includes a segment of travel route near a designated area of aesthetic claim serving as a secondary access route to the area. Public view includes a rural residential use area and segment of road that serves as the primary access route to it within one mile. Public view includes a maintained religious facility or cemetery.
Low	
√	Public view includes an agricultural, commercial, industrial, manufacturing, research and development intensive land use area. Public view includes a small aggregation of dwellings.
None	
	No public view.

Adapted from Aspen Environmental Group, "Final Environmental Impact Report Tranquillon Ridge Oil and Gas Development Project" prepared for County of Santa Barbara Planning and Development. Santa Barbara, CA, April 2008, Vol. 1, pp. 5.13-5-6, and "Final Environmental Impact Report Southern California International Gateway Project," Appendix B Aesthetics Visual Resource Methodology, Los Angeles Harbor Department, Los Angeles, CA, March 2013.

Table 6 VISIBILITY	
Rating	
Dominant Dominates view because project would fill most of visual field for views in its general direction. Stark contrast in form, line, color, texture, luminance, or motion may contribute to view dominance.	An object with strong visual contrast that is of such enormous size that it occupies most of the visual field, and views of it cannot be avoided except by turning the head greater than 45 degrees from a direct view of the object. The object is the major focus of visual attention, and its large apparent size is a major factor in its view dominance. In addition to size, contrast in form, line, color, and texture, bright light sources, and moving objects associated with the project may contribute substantially to drawing viewer attention. The visual prominence of the project detracts noticeably from views of other landscape components.
High Strongly attracts visual attention of views in general direction of project. Attention may be drawn by stark contrast in form, line, color, or texture, luminance, or motion.	An object that is not of enormous size, but contrasts with the surrounding landscape components so strongly that it is a major focus of visual attention, drawing viewer attention immediately, and tending to hold viewer attention. In addition to stark contrast in form, line, color, and texture, bright light sources, and moving objects associated with the project may contribute substantially to drawing viewer attention. The visual prominence of project interferes noticeably with views of nearby landscape components.
Moderate to High Plainly visible, could not be missed by casual observer, but does not strongly attract visual attention, or dominate view because of apparent size, for views in general direction of project.	An object that is obvious and with enough size or contrast to compete with other landscape components, but with insufficient visual contrast to strongly attract visual attention and insufficient size to occupy most of the observer's visual field.
Moderate √ Visible after brief glance in general direction of project and unlikely to be missed by casual observer.	An object that can be easily detected after a brief look and would be visible to most casual observers, but without enough size or contrast to compete with major landscape components.
Low to Moderate Visible when scanning in general direction of project; otherwise, likely to be missed by casual observer.	An object that is very small and/or faint, but when the observer is scanning the horizon or looking more closely at an area can be detected without extended viewing. A casual observer could sometimes notice it; however, most people would not notice it without some active looking.
Low Visible only after extended, close viewing; otherwise, invisible.	An object that is near the extreme limit of visibility. A person who was not aware of it in advance and looking for it could not see it. Even under those circumstances, the object can only be seen after looking at it closely for an extended period.
Adapted from R.G. Sullivan, L.B. Kirchler, T. Lahti, S. Roche, K. Beckman, B. Cantwell, P. Richmond, "Wind Turbine Visibility and Visual Impact Threshold Distances in Western Landscapes," University of Chicago Argonne, LLC submitted to the National Association of Environmental Professionals 37th Annual Conference Proceedings, Portland, Oregon, May 21-24, 2012, p. 17.	

Table 7 BASIC DESIGN ELEMENT CONTRAST

Element	Rating[1]	Weight	Points	
Color	Strong = 3 Moderate = 2 Weak = 1 **None = 0**	x 3	0	Color is "the light-reflecting qualities of a project's surface (for example, dark or light, blue or gray) in relation to background colors."[2] "Colors that harmonize well seem to belong together and produce pleasing visual effects. Colors that do not harmonize are disturbing to the viewer."[3] Contrast in color depends on the exterior surface degree of lightness or darkness, gradation or variety of a color, the degree of saturation or brilliance of a color in the project to those that continue to exist in the landscape.
Form	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 2	2	Form is "the configuration and outline of the project in terms of masses, patterns, and linear elements. For example, a structure may have a bulky, vertical, geometric silhouette which contrasts with an irregular horizontal landscape of rolling hills."[4] Forms exist in three dimensions (height, length, width). For instance, the shape is a square its form is a cube. Forms that are bold, regular, solid, or vertical tend to prevail in the landscape. Contrast in form depends on how alike the form(s) of the project is to those that continue to exist in the landscape.
Line	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 1	1	"Line is the path, real or imagined that the eye follows when perceiving abrupt differences when objects are aligned in a one-dimensional sequence."[5] "Line in the landscape is created by the edge between two materials, the outline or silhouette of a form, or a long linear feature."[6] Properties of lines include: straight, diagonal, curved, vertical, horizontal. Contrast in line depends on edge types and interruption, or introduction of edges, bands, and silhouette lines in the project to those that continue to exist in the landscape.
Texture	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 1	1	Texture is "the aggregation of small forms or color mixtures into a continuous surface pattern; the aggregated parts are enough that they do not appear as discrete objects in the composition of the scene."[7] "Details of the surface pattern, as in smooth polished metal surfaces versus the rough, uneven textures of the foliage of trees and bushes"[8] Contrast in texture depends on the relative dimensions of the surface variations from large to small, spacing of surface variations, and the degree of uniform recurrence and symmetrical arrangement of the surface variation in the project to those that continue to exist in the landscape.
	Overall Rating[9]		+ 4	
	Maximum 21 points			

Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, CA, 1979.

[1] **Strong** — the project contrast demands attention will not be overlooked and is dominant in the landscape. **Moderate** — the project contrast begins to attract attention and begins to dominate the characteristic landscape. **Weak** — the project contrast can be seen but does not attract attention. **None** — the project contrast is not visible or perceived. (U.S. Department of Interior Bureau of Land Management Manual 8431-Visual Resources Contrast Rating, January 17, 1986.)

[2] Stephen R.J. Sheppard, *Visual Simulation A User's Guide For Architects, Engineers, And Planners*, Van Nostrand Reinhold, New York, 1989, p. 46.

[3] U.S. Department of Transportation Federal Highway Administration, "A Guide to Visual Quality in Noise Barrier Design," Chapter 3. Visual Design Principles, n.d.

[4] Sheppard, p. 46.

[5] U.S. Department of Interior Bureau of Land Management Manual 8431-1 Visual Resources Contrast Rating, January 17, 1986.

[6] Gail Hansen, "Basic Principles of Landscape Design." Florida Cooperative Extension Service Institute of Food and Agricultural Science, University of Florida, Gainesville, Florida, July 2010.

[7] U.S. Department of Interior Bureau of Land Management Manual 8431-1 Visual Resources Contrast Rating, January 17, 1986.

[8] Sheppard, p. 47.

[9] Overall Rating is for descriptive purpose: Strong — 1-3 ratings Strong or 3 ratings Moderate; Moderate — 1-2 ratings Moderate with no higher ratings; Weak — 1-3 ratings Weak with no higher ratings; None — all ratings None.

Table 8 SCALE DOMINANCE				
Rating				**Points**
Dominant	The project is the major object in the landscape and occupies a large part of the landscape.			12
Codominant	The project is one of the major objects in the landscape or is the major object or area in a panoramic landscape.			8
Subordinate	The project is of significant size but occupies a minor part of the landscape.			4
Insignificant	The project is a small object occupying an exceedingly small area in the landscape.			0
		Single highest points	Maximum 12 points	0
Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1979.				

Table 9 SPATIAL DOMINANCE

Category			Single Highest Rating
Spatial composition of the landscape	"[T]he arrangement of objects and voids in the landscape can be categorized by their spatial composition .... Some compositions, especially those which are distinctly focal, enclosed, or feature-oriented, are more vulnerable to modifications than others, depending upon how strongly the spatial configuration draws the eye to certain locations."[1]		**Dominant** 2-3 categories rated prominent = 6 points **Codominant** 1 category rated prominent, or 2 categories rated significant = 4 points **Subordinate √** 1 category rated significant = 2 points **Insignificant** All categories rated inconspicuous = 0 points
	Rating	**Description**	
	prominent	Feature[2], Focal[2], or Enclosed[2] landscape.	
	significant	Panoramic,[2] or weak focal, feature or enclosed landscape.	
	inconspicuous	Canopied,[2] indistinct or obscured landscape.	
Spatial position of the project	"Spatial position of the project in relation to the three-dimensional arrangement of objects and voids in the landscape. Important spatial aspects of the project include relationship to the skyline, location in topographic spaces such as focal valleys or broad plains, and position with regard to streetscapes and architectural arrangements."[3]		
	Rating	**Description**	
	prominent	Interfluve,[4] High Level,[4] High Slope,[4]	
	significant	Low Level,[4] Lowslope,[4] Midslope[4]	
	inconspicuous	Basin Floor,[4] Footslope,[4] Toeslope[4]	
Backdrop to the project	"[T]he backdrop against which an object is seen affects its visual contrast. Modifications seen against the sky or water are usually more prominent than against a land backdrop."[5]		
	Rating	**Description**	
	prominent	All or a significant part of the project will be seen against sky or water.	
	inconspicuous	All or a significant part of the project will be seen against land.	
	Single highest points	Maximum 6 points	2

Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1979.

[1] U.S. Department of Interior Bureau of Land Management Manual H-8431-1 Visual Resources Contrast Rating, January 17, 1986.

[2] **Canopied** — landscape where features overhead (above eye level) create a canopy or ceiling. **Enclosed** — a space, large or small surrounded by continuous grouping of objects creating walls and floor. It may have a large vertical dimension, but typically a restricted horizontal one. **Feature** — landscape dominated by a feature or a group of objects in the distance to which the eye is drawn. **Focal** — converging lines in the landscape or progressions of aligned objects lead the eye to a focal point in the landscape. **Panoramic** — a broad horizontal composition. Little or no sense of boundary restriction; no apparent limit to the view. Foreground or middle ground objects do not substantially block viewing of background objects. (U.S. Department of Interior Bureau of Land Management Manual H-8431-1 Visual Resources Contrast Rating, January 17, 1986.)

[3] Stephen R.J. Sheppard, *Visual Simulation A User's Guide For Architects, Engineers, And Planners*, Van Nostrand Reinhold, New York, 1989, p. 46.

[4] **Basin Floor** — nearly level to gently sloping, bottom surface of an intermontane basin. **Footslope** — the gently inclined hillslope at the foot of a hill. **High Level** — level top of plateau. **High Slope** — geomorphic part that forms the uppermost inclined surface at the top of a slope (e.g., shoulder slope, upper slope). **Interfluve** — linear top of ridge, hill or mountain. **Low Level** — valley floor, or shoreline being the former position of an alluvial plain, lake, or shore. **Lowslope** — inner gently inclined surface at the base of a slope. Surface profile is generally concave and a transition between midslope or backslope, and toeslope. **Midslope** — intermediate slope position between high and low (e.g., middle slope). (Adapted from T. Liang [1951]; J.B. Dalrymple, R.J. Blong, and A. Conacher. [1968]) **Toeslope** — the gently inclined surface at the base of a hillslope. Toeslope in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors. (USDA Soil Survey Manual Handbook No. 18, issued March 2017 as amended February 2018).

[5] U.S. Department of Interior Bureau of Land Management Manual H-8431-1.

Table 11 CAPABILITY							
Category	For each category check (√) the rating that best describes the existing landscape.						
		Rating					
		High		**Moderate**		**Low**	
Topography		High amount of topographic diversity and variety.		Moderate amount of topographic diversity and variety.		Low amount of topographic diversity and variety.	√
Land Use Pattern	If project in rural landscape	Small natural or vegetated areas. Man-made structures dominant in the view.		Natural areas of local significance. Man-made structures widespread but not dominant in the view.	√	Remote natural areas of regional significance. Man-made structures and features limited and scattered.	
	If project in urban landscape	Developed areas including commercial development. Large-scale infrastructure or structures may be common and more dominant.		Suburban or mostly developed areas with components of local importance. Large-scale infrastructure or structures may be visible but not dominant.		Clustered development surrounded by rural scattered development. Large-scale infrastructure or structures limited and scattered.	
Visual Variety		Landscape exhibits a high degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit high degree of variety in landforms and vegetation.		Landscape exhibits a moderate degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit moderate variety in landforms and vegetation.	√	Landscape exhibits a low degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit minimal variety in landforms and vegetation.	
Major Focal Points or Features		Focal points or features in the viewshed that are either natural or man-made, commonly found, minimal local importance/value, or contribute little to the character of the landscape or are indistinct.	√	Focal points or features in the viewshed that are either natural or man-made, somewhat commonly found, local importance/value, or make a minor contribution to the character of the landscape.		Focal points or features in the viewshed that are either natural or man-made and are unusual or rare, regional importance/value, or make a major contribution to the character of the landscape or are somewhat distinctive.	

Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 17, and L. Blocker, T. Slider, J. Ruchman, J. Mosier, L. Kok, J. Silbemagle, J. Beard, D. Wagner, G. Brogan, D. Jones, N. Laughlinn, L. Anderson, "Landscape Aesthetic (AH 701-i) - Visual Absorption Capability (Appendix C)," United States Department of Agriculture Forest Service, 1995, pp. C-1-C-8.

Table 12 ABSORPTION	
Circle the applicable rating for the proposed project in the existing landscape; High = H, Moderate = M, Low = L.	
Exposure	**Rating**
What is the level of exposure of the project in the landscape? The higher the level of exposure the lower the absorption.	**(H) M L**
What is the intensity of the observation of the project? The more the project is observed from certain intensive land uses the lower its absorption (e.g., view from a densely populated residential area versus a heavy manufacturing area).	**(H) M L**
What is the view distance to the project? The farther the viewing distance to the project from the vantage point the lower its exposure the higher its absorption. Is the project more than three miles away?	**H (M) L**
What is the project distance from an urban skyline or a natural skyline (e.g., high-rise buildings or a mountain range against a backdrop of sky)? The closer the project is to an urban or natural skyline the lower its absorption.	**(H) M L**
What is the project topographic position in the landscape? As the project position increases its absorption decreases (e.g., toeslope to summit).	**(H) M L**
Focal Point	
Is the project near a focal point in the landscape? A focal point is a converging of lines in the landscape or progressions of aligned objects that lead the eye to a point. A focal point gives the viewer something interesting to look at in the view. The closer the project is to a focal point, the greater viewer scrutiny, the lower the absorption.	**(H) M L**
Does the edge(s) in the landscape have a diverse background but have the propensity to become a focal point? An edge is a transitional linear place where one space or landscape becomes part of another. An edge has a high absorption due to a diverse background, a low absorption due to the propensity to become a focal point (e.g., city meets country, a woodland edge, an alpine tree line, coastline).	**(H) M L**
Trees & Vegetation	
Are trees and vegetation in the landscape missing, deficient, or uniform? The greater the density of trees and vegetation, the greater the coverage, the greater the capacity of an area to absorb physical change.	**(H) M L**
What is the type(s) of tree(s) and vegetation in the landscape? Tree and vegetation types vary the absorption of the physical change. A uniformly tall, dense stand of trees has screening ability. Vegetation types such as evergreen shrubs and similar have greater absorption than dwarf shrubs, ornamental grasses, and grass-like plants. Trees and vegetation can provide high absorption in the foreground but lower absorption in the background.	**(H) M L**
Disturbed Surface Area	
What is the period of time to restore the project disturbed surface area to its pre-construction activity condition? The longer the time to restore the disturbed area to its undisturbed original condition, the lower the absorption; 1 year = high, 2 to 3 years = moderate, 3 years or more = low.	**H (M) L**
Adapted from S. Amir, E. Gidalizon, "Expert-based method for the evaluation of visual absorption capacity of the landscape*," Journal of Environmental Management, 1990, Vol. 30, pp. 251-263, and W.C. Yeomans, "A Proposed Biophysical Approach to Visual Absorption Capability (VAC),[1]" Pacific Southwest Forest and Range Experimental Station, Berkeley, California, 1979 submitted to the National Conference on Applied Techniques for Analysis and Management of Visual Resource, Incline Village, Nevada, April 23-25, 1979, pp. 172-181.	

Table 13 MAGNITUDE OF CHANGE				
Dominant	**Prominent**	**Conspicuous**	**Apparent**	**Unobtrusive**
Project commands or controls the view in the landscape. Project causes a very large alteration to the landscape or features within the landscape such that there is a fundamental change from the existing physical environment.	Project stands out or is striking in the view in the landscape. Project causes a large alteration to the landscape or features within the landscape such that there is an unmistakable change from the existing physical environment.	Project is clearly visible and noticeable in the view in the landscape. Project causes a moderate alteration to the landscape or features within the landscape such that there is a distinct change from the existing physical environment.	Project visible or evident in the view in the landscape. Project causes a small alteration to the landscape or features within the landscape such that there is a perceptible change from the existing physical environment.	Project indistinct or not obvious in the view in the landscape. Project causes a very small alteration to the landscape, or features within the landscape such that there is a de minimis change from the existing physical environment.
Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 20.				

Table 14 VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OF SITE AND ITS SURROUNDINGS							
Landscape		**Project Prominence**		**Visual Absorption Capability**	**Magnitude Of Change**		**CEQA Guidelines Level Of Effect On The Environment** (See Table 15)
Table	**Rating**	**Rating**		**Rating**			
Landscape Character	See Table 3	Severe		(High)	Dominant		Significant Effect
Unity	See Table 4	Strong			Prominent		
Public View	**Low**	Moderate		Moderate	Conspicuous		
Visibility	**Moderate**	Weak			**Apparent**	√	Less Than Significant Effect
		Negligible	√	Low	Unobtrusive		

Table 15 CEQA GUIDELINES LEVEL OF EFFECT ON THE ENVIRONMENT

Significant Effect on the Environment "means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic and aesthetic significance." (14 CCR § 15382) (Pub. Res. Code § 21060.5, 14 CCR § 15360) The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, noncompliance with which means the effect will normally be determined to be significant by the [lead] agency...." (14 CCR § 15064.7[a])

Less Than Significant Effect with Mitigation Incorporated. The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "... but (1) revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed [CEQA environmental document (e.g., Negative Declaration) is] released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and (2) there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment." (Pub. Res. Code § 21064.5, 14 CCR § 15369.5) (Pub. Res. Code § 21002)

Less Than Significant Effect. The physical change by the proposed project to the existing physical environment does not reach the threshold of significance "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, ... compliance with which means the effect normally will be determined to be less than significant." (14 CCR § 15064.7[a])

Key Observation Point Evaluation Worksheet
Summary Sheet for Worksheet Tables

Key Observation Point No. 3 - Sonny Bono Salton Sea National Wildlife Refuge Entrance

LANDSCAPE			
Table 3 LANDSCAPE CHARACTER	Aesthetic Aspect		See attached Table 3.
	Perceptual Aspect		
	Basic Design Element		
	Landscape	**Rating**	Write the rating selected in the attached Table 4.
Table 4 UNITY	Rarity	Low to Moderate	
	Detractors	Low to Moderate	
	Distinctiveness	Low to Moderate	
	Diversity	Moderate to High	
	Integrity	Moderate to High	
	Rating	**Checkbox**	Check (√) the rating selected in the attached Tables 5 and 6.
Table 5 PUBLIC VIEW	High		
	Moderate		
	Low	√	
	None		
Table 6 VISIBILITY	Dominant		
	High		
	Moderate to High		
	Moderate		
	Low to Moderate	√	
	Low		

PROJECT PROMINENCE			
Table 7 Basic Design Element Contrast			
Basic Design Element	**Rating**	**Weight**	**Points**
Color	Strong = 3	x 3	3
	Moderate = 2		
	Weak = 1		
	None = 0		
Form	Strong = 3	x 2	2
	Moderate = 2		
	Weak = 1		
	None = 0		
Line	Strong = 3	x 1	2
	Moderate = 2		
	Weak = 1		
	None = 0		
Texture	Strong = 3	x 1	1
	Moderate = 2		
	Weak = 1		
	None = 0		
		Maximum 21 points	8

Table 8 SCALE DOMINANCE				
Rating				**Points**
Dominant	The project is the major object in the landscape and occupies a large part of the landscape.			12
Codominant	The project is one of the major objects in the landscape or is the major object or area in a panoramic landscape.			8
Subordinate	The project is of significant size but occupies a minor part of the landscape.			4
Insignificant	The project is a small object occupying an exceedingly small area in the landscape.			0
		Single highest points	Maximum 12 points	0

Table 9 SPATIAL DOMINANCE				
Category	**Rating**	**Single Highest Rating**		**Points**
Spatial composition of the landscape.	prominent **significant** inconspicuous	Dominant 2-3 categories rated prominent.		6
Spatial position of the project.	prominent **significant** inconspicuous	**Codominant √** 1 category rated prominent, or 2 categories rated significant.		4
		Subordinate 1 category rated significant.		2
Backdrop to the project.	prominent **inconspicuous**	Insignificant All categories rated inconspicuous.		0
		Single highest points	Maximum 6 points	4

Table 10 PROJECT PROMINENCE RATING	
Total Points	**Rating**
32-39	Severe
24-31	Strong
16-23	Moderate
8-15	**Weak**
0-7	Negligible
	Rating ≡ Weak

VISUAL ABSORPTION CAPABILITY			
Table 11 CAPABILITY **Table 12 ABSORPTION**	**Rating**	**Checkbox**	The existing landscape capability to absorb the physical change by the proposed project without an alteration to its landscape character.
	High		
	Moderate	**√**	
	Low		

Table 13 MAGNITUDE OF CHANGE		
		Checkbox
Dominant	Project commands or controls the view in the landscape.	
Prominent	Project stands out or is striking in the view in the landscape.	
Conspicuous	Project is clearly visible and noticeable in the view in the landscape.	
Apparent	Project visible or evident in the view in the landscape.	
Unobtrusive	Project indistinct or not obvious in the view in the landscape.	**√**

Table 14 VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OF SITE AND ITS SURROUNDINGS		
CEQA Guidelines Level of Effect on the Environment	Significant Effect	
	Less Than Significant Effect	**√**

Key Observation Point Evaluation Tables
Full Evaluation Worksheet Tables Displayed

Key Observation Point No. 3

Table 3 LANDSCAPE CHARACTER											
Aesthetic	**Description**								Check (√) the description that best describes the aspect of the landscape.		
Balance	harmonious		balanced	√	discordant		chaotic				
Complexity	uniform	√	simple		diverse		complex				
Dynamic	sweeping		spreading	√	disperse		channeled				
Enclosure	expansive	√	open		enclosed		constrained				
Pattern	formal		organized		regular	√	random				
Perceptual											
Pleasure	beautiful		attractive		pleasant	√	unpleasant		nasty		
Security	intimate		comfortable	√	safe		unsettling		threatening		
Stimulus	inspiring		challenging		interesting		bland	√	monotonous		
Tranquility	inaccessible		remote	√	vacant		peaceful		busy		
Basic Design Element											
Color	monochrome		muted	√	colorful		garish		The basic design elements are the source of visual contrast in the landscape that an individual sees and responds to when viewing a space.		
Form	angular	√	curvilinear		horizontal		rounded				
Line	straight		curved		vertical	√	horizontal				
Texture	smooth		textured	√	rough		very rough				
Scale	intimate		small		large	√	vast				

Adapted from Carys Swanwick, "Landscape Character Assessment Guidance for England and Scotland," prepared for The Countryside Agency and Scottish Natural Heritage, 2002, pp. 30-36.

Table 4 UNITY						
Landscape	**Rating**					**Guidance**
	High	**Moderate to High**	**Moderate**	**Low to Moderate**	**Low**	
Rarity	rare			√	common	Is this landscape unique or familiar in the region or state?
Detractors	many			√	few	Are there man-made and/or natural landscape features out of place?
Distinctiveness	distinct			√	indistinct	Is it easy to remember this landscape? Are patterns dramatic or take detecting?
Diversity	orderly	√			muddled	Is there a recognizable order to the landscape features or are there too many patterns overlapping?
Integrity	whole	√			remnant	What patterns in the landscape are evident? Are sections missing and to what extent?

Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 36.

Table 5 PUBLIC VIEW	
Rating	
High	
	Public view includes areas where the aesthetic value is protected by federal, state, county or city, law, ordinance, regulation, or standard. Public view includes federal, state, county, city designated areas of aesthetic, cultural, and recreational claim, such as: a park, outdoor recreation area, etc.; coastal or forest reserve, open space preserve, urban green space, etc.; scenic overlook, scenic river, scenic trail, etc.; historic building, district, or site; a site having a cultural resource. Public view includes a federal or state designated scenic byway, highway, or road; designated scenic highway or road of regional importance; a segment of travel route, such as a road, rail line, pedestrian and equestrian trail, bicycle path near a designated area of aesthetic claim and leading directly to it. View approaching an area of aesthetic, cultural, and recreational claim that may be closely related to the appreciation of the aesthetic, cultural, and recreational significance at that designation. Public view includes an urban residential use area and segment of road that serves as the primary access route to it.
Moderate	
	Public view includes undesignated but popularly used or appreciated area of aesthetic, cultural, and recreational claim of significance in the region. Public view includes a highway or road locally designated as a scenic route and of importance only to the local population, or informally designated as such in road atlases, road maps, and tour book guides. Public view includes segments of travel routes, such as roads, pedestrian and equestrian trails, bicycle paths that are near and are the primary access to a popularly used undesignated area important for their aesthetic, cultural, or recreational claim. Public view includes a segment of travel route near a designated area of aesthetic claim serving as a secondary access route to the area. Public view includes a rural residential use area and segment of road that serves as the primary access route to it within one mile. Public view includes a maintained religious facility or cemetery.
Low	
√	Public view includes an agricultural, commercial, industrial, manufacturing, research and development intensive land use area. Public view includes a small aggregation of dwellings.
None	
	No public view.

Adapted from Aspen Environmental Group, "Final Environmental Impact Report Tranquillon Ridge Oil and Gas Development Project" prepared for County of Santa Barbara Planning and Development. Santa Barbara, CA, April 2008, Vol. 1, pp. 5.13-5-6, and "Final Environmental Impact Report Southern California International Gateway Project," Appendix B Aesthetics Visual Resource Methodology, Los Angeles Harbor Department, Los Angeles, CA, March 2013.

Table 6 VISIBILITY	
Rating	
Dominant Dominates view because project would fill most of visual field for views in its general direction. Stark contrast in form, line, color, texture, luminance, or motion may contribute to view dominance.	An object with strong visual contrast that is of such large size that it occupies most of the visual field, and views of it cannot be avoided except by turning the head greater than 45 degrees from a direct view of the object. The object is the major focus of visual attention, and its large apparent size is a major factor in its view dominance. In addition to size, contrast in form, line, color, and texture, bright light sources, and moving objects associated with the project may contribute substantially to drawing viewer attention. The visual prominence of the project detracts noticeably from views of other landscape components.
High Strongly attracts visual attention of views in general direction of project. Attention may be drawn by stark contrast in form, line, color, or texture, luminance, or motion.	An object that is not of enormous size, but contrasts with the surrounding landscape components so strongly that it is a major focus of visual attention, drawing viewer attention immediately, and tending to hold viewer attention. In addition to stark contrast in form, line, color, and texture, bright light sources, and moving objects associated with the project may contribute substantially to drawing viewer attention. The visual prominence of project interferes noticeably with views of nearby landscape components.
Moderate to High Plainly visible, could not be missed by casual observer, but does not strongly attract visual attention, or dominate view because of apparent size, for views in general direction of project.	An object that is obvious and with enough size or contrast to compete with other landscape components, but with insufficient visual contrast to strongly attract visual attention and insufficient size to occupy most of the observer's visual field.
Moderate Visible after brief glance in general direction of project and unlikely to be missed by casual observer.	An object that can be easily detected after a brief look and would be visible to most casual observers, but without enough size or contrast to compete with major landscape components.
Low to Moderate √ Visible when scanning in general direction of project; otherwise, likely to be missed by casual observer.	An object that is very small and/or faint, but when the observer is scanning the horizon or looking more closely at an area can be detected without extended viewing. A casual observer could sometimes notice it; however, most people would not notice it without some active looking.
Low Visible only after extended, close viewing; otherwise, invisible.	An object that is near the extreme limit of visibility. A person who was not aware of it in advance and looking for it could not see it. Even under those circumstances, the object can only be seen after looking at it closely for an extended period.
Adapted from R.G. Sullivan, L.B. Kirchler, T. Lahti, S. Roche, K. Beckman, B. Cantwell, P. Richmond, "Wind Turbine Visibility and Visual Impact Threshold Distances in Western Landscapes," University of Chicago Argonne, LLC submitted to the National Association of Environmental Professionals 37th Annual Conference Proceedings, Portland, Oregon, May 21-24, 2012, p. 17.	

BASIC DESIGN ELEMENT CONTRAST				
Element	**Rating[1]**	**Weight**	**Points**	
Color	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 3	3	Color is "the light-reflecting qualities of a project's surface (for example, dark or light, blue or gray) in relation to background colors."[2] "Colors that harmonize well seem to belong together and produce pleasing visual effects. Colors that do not harmonize are disturbing to the viewer."[3] Contrast in color depends on the exterior surface degree of lightness or darkness, gradation or variety of a color, the degree of saturation or brilliance of a color in the project to those that continue to exist in the landscape.
Form	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 2	2	Form is "the configuration and outline of the project in terms of masses, patterns, and linear elements. For example, a structure may have a bulky, vertical, geometric silhouette which contrasts with an irregular horizontal landscape of rolling hills."[4] Forms exist in three dimensions (height, length, width). For instance, the shape is a square its form is a cube. Forms that are bold, regular, solid, or vertical tend to prevail in the landscape. Contrast in form depends on how alike the form(s) of the project is to those that continue to exist in the landscape.
Line	Strong = 3 **Moderate = 2** Weak = 1 None = 0	x 1	2	"Line is the path, real or imagined that the eye follows when perceiving abrupt differences when objects are aligned in a one-dimensional sequence."[5] "Line in the landscape is created by the edge between two materials, the outline or silhouette of a form, or a long linear feature."[6] Properties of lines include: straight, diagonal, curved, vertical, horizontal. Contrast in line depends on edge types and interruption, or introduction of edges, bands, and silhouette lines in the project to those that continue to exist in the landscape.
Texture	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 1	1	Texture is "the aggregation of small forms or color mixtures into a continuous surface pattern; the aggregated parts are enough that they do not appear as discrete objects in the composition of the scene."[7] "Details of the surface pattern, as in smooth polished metal surfaces versus the rough, uneven textures of the foliage of trees and bushes"[8] Contrast in texture depends on the relative dimensions of the surface variations from large to small, spacing of surface variations, and the degree of uniform recurrence and symmetrical arrangement of the surface variation in the project to those that continue to exist in the landscape.
	Overall Rating[9]		+ 8	
	Maximum 21 points			

Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, CA, 1979.

[1] **Strong** — the project contrast demands attention will not be overlooked and is dominant in the landscape. **Moderate** — the project contrast begins to attract attention and begins to dominate the characteristic landscape. **Weak** — the project contrast can be seen but does not attract attention. **None** — the project contrast is not visible or perceived. (U.S. Department of Interior Bureau of Land Management Manual 8431-Visual Resources Contrast Rating, January 17, 1986.)

[2] Stephen R.J. Sheppard, *Visual Simulation A User's Guide For Architects, Engineers, And Planners*, Van Nostrand Reinhold, New York, 1989, p. 46.

[3] U.S. Department of Transportation Federal Highway Administration, "A Guide to Visual Quality in Noise Barrier Design," Chapter 3. Visual Design Principles, n.d.

[4] Sheppard, p. 46.

[5] U.S. Department of Interior Bureau of Land Management Manual 8431-1 Visual Resources Contrast Rating, January 17, 1986.

[6] Gail Hansen, "Basic Principles of Landscape Design." Florida Cooperative Extension Service Institute of Food and Agricultural Science, University of Florida, Gainesville, Florida, July 2010.

[7] U.S. Department of Interior Bureau of Land Management Manual 8431-1 Visual Resources Contrast Rating, January 17, 1986.

[8] Sheppard, p. 47.

[9] Overall Rating is for descriptive purpose: Strong — 1-3 ratings Strong or 3 ratings Moderate; Moderate — 1-2 ratings Moderate with no higher ratings; Weak — 1-3 ratings Weak with no higher ratings; None — all ratings None.

Table 8 SCALE DOMINANCE				
Rating				**Points**
Dominant	The project is the major object in the landscape and occupies a large part of the landscape.			12
Codominant	The project is one of the major objects in the landscape or is the major object or area in a panoramic landscape.			8
Subordinate	The project is of significant size but occupies a minor part of the landscape.			4
Insignificant	The project is a small object occupying an exceedingly small area in the landscape.			0
		Single highest points	Maximum 12 points	0
Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1979.				

Table 9 SPATIAL DOMINANCE

Category			Single Highest Rating
Spatial composition of the landscape	"[T]he arrangement of objects and voids in the landscape can be categorized by their spatial composition .... Some compositions, especially those which are distinctly focal, enclosed, or feature-oriented, are more vulnerable to modifications than others, depending upon how strongly the spatial configuration draws the eye to certain locations."[1]		**Dominant** 2-3 categories rated prominent = 6 points **Codominant √** 1 category rated prominent, or 2 categories rated significant = 4 points **Subordinate** 1 category rated significant = 2 points **Insignificant** All categories rated inconspicuous = 0 points
	Rating	**Description**	
	prominent	Feature[2], Focal[2], or Enclosed[2] landscape.	
	significant	Panoramic,[2] or weak focal, feature or enclosed landscape.	
	inconspicuous	Canopied,[2] indistinct or obscured landscape.	
Spatial position of the project	"Spatial position of the project in relation to the three-dimensional arrangement of objects and voids in the landscape. Important spatial aspects of the project include relationship to the skyline, location in topographic spaces such as focal valleys or broad plains, and position with regard to streetscapes and architectural arrangements."[3]		
	Rating	**Description**	
	prominent	Interfluve,[4] High Level,[4] High Slope,[4]	
	significant	Low Level,[4] Lowslope,[4] Midslope[4]	
	inconspicuous	Basin Floor,[4] Footslope,[4] Toeslope[4]	
Backdrop to the project	"[T]he backdrop against which an object is seen affects its visual contrast. Modifications seen against the sky or water are usually more prominent than against a land backdrop."[5]		
	Rating	**Description**	
	prominent	All or a significant part of the project will be seen against sky or water.	
	inconspicuous	All or a significant part of the project will be seen against land.	
		Single highest points / Maximum 6 points	4

Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1979.

[1] U.S. Department of Interior Bureau of Land Management Manual H-8431-1 Visual Resources Contrast Rating, January 17, 1986.

[2] **Canopied** — landscape where features overhead (above eye level) create a canopy or ceiling. **Enclosed** — a space, large or small surrounded by continuous grouping of objects creating walls and floor. It may have a large vertical dimension, but typically a restricted horizontal one. **Feature** — landscape dominated by a feature or a group of objects in the distance to which the eye is drawn. **Focal** — converging lines in the landscape or progressions of aligned objects lead the eye to a focal point in the landscape. **Panoramic** — a broad horizontal composition. Little or no sense of boundary restriction; no apparent limit to the view. Foreground or middle ground objects do not substantially block viewing of background objects. (U.S. Department of Interior Bureau of Land Management Manual H-8431-1 Visual Resources Contrast Rating, January 17, 1986.)

[3] Stephen R.J. Sheppard, *Visual Simulation A User's Guide For Architects, Engineers, And Planners*, Van Nostrand Reinhold, New York, 1989, p. 46.

[4] **Basin Floor** — nearly level to gently sloping, bottom surface of an intermontane basin. **Footslope** — the gently inclined hillslope at the foot of a hill. **High Level** — level top of plateau. **High Slope** — geomorphic part that forms the uppermost inclined surface at the top of a slope (e.g., shoulder slope, upper slope). **Interfluve** — linear top of ridge, hill or mountain. **Low Level** — valley floor, or shoreline being the former position of an alluvial plain, lake, or shore. **Lowslope** — inner gently inclined surface at the base of a slope. Surface profile is generally concave and a transition between midslope or backslope, and toeslope. **Midslope** — intermediate slope position between high and low (e.g., middle slope). (Adapted from T. Liang [1951]; J.B. Dalrymple, R.J. Blong, and A. Conacher. [1968]) **Toeslope** — the gently inclined surface at the base of a hillslope. Toeslope in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors. (USDA Soil Survey Manual Handbook No. 18, issued March 2017 as amended February 2018).

[5] U.S. Department of Interior Bureau of Land Management Manual H-8431-1.

Table 11 CAPABILITY							
Category	For each category check (√) the rating that best describes the existing landscape.						
		Rating					
		High		**Moderate**		**Low**	
Topography		High amount of topographic diversity and variety.		Moderate amount of topographic diversity and variety.		Low amount of topographic diversity and variety.	√
Land Use Pattern	If project in rural landscape	Small natural or vegetated areas. Man-made structures dominant in the view.		Natural areas of local significance. Man-made structures widespread but not dominant in the view.	√	Remote natural areas of regional significance. Man-made structures and features limited and scattered.	
	If project in urban landscape	Developed areas including commercial development. Large-scale infrastructure or structures may be common and more dominant.		Suburban or mostly developed areas with components of local importance. Large-scale infrastructure or structures may be visible but not dominant.		Clustered development surrounded by rural scattered development. Large-scale infrastructure or structures limited and scattered.	
Visual Variety		Landscape exhibits a high degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit high degree of variety in landforms and vegetation.		Landscape exhibits a moderate degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit moderate variety in landforms and vegetation.		Landscape exhibits a low degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit minimal variety in landforms and vegetation.	√
Major Focal Points or Features		Focal points or features in the viewshed that are either natural or man-made, commonly found, minimal local importance/value, or contribute little to the character of the landscape or are indistinct.	√	Focal points or features in the viewshed that are either natural or man-made, somewhat commonly found, local importance/value, or make a minor contribution to the character of the landscape.		Focal points or features in the viewshed that are either natural or man-made and are unusual or rare, regional importance/value, or make a major contribution to the character of the landscape or are somewhat distinctive.	
Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 17, and L. Blocker, T. Slider, J. Ruchman, J. Mosier, L. Kok, J. Silbemagle, J. Beard, D. Wagner, G. Brogan, D. Jones, N. Laughlinn, L. Anderson, "Landscape Aesthetic (AH 701-i) - Visual Absorption Capability (Appendix C)," United States Department of Agriculture Forest Service, 1995, pp. C-1-C-8.							

Table 12 ABSORPTION	
Circle the applicable rating for the proposed project in the existing landscape; High = H, Moderate = M, Low = L.	
Exposure	**Rating**
What is the level of exposure of the project in the landscape? The higher the level of exposure the lower the absorption.	H (M) L
What is the intensity of the observation of the project? The more the project is observed from certain intensive land use the lower its absorption (e.g., view from a densely populated residential area versus a heavy manufacturing area).	H (M) L
What is the view distance to the project? The farther the viewing distance to the project from the vantage point the lower its exposure the higher its absorption. Is the project more than three miles away?	H (M) L
What is the project distance from an urban skyline or a natural skyline (e.g., high-rise buildings or a mountain range against a backdrop of sky)? The closer the project is to an urban or natural skyline the lower its absorption.	(H) M L
What is the project topographic position in the landscape? As the project position increases its absorption decreases (e.g., toeslope to summit).	(H) M L
Focal Point	
Is the project near a focal point in the landscape? A focal point is a converging of lines in the landscape or progressions of aligned objects that lead the eye to a point. A focal point gives the viewer something interesting to look at in the view. The closer the project is to a focal point, the greater viewer scrutiny, the lower the absorption.	(H) M L
Does the edge(s) in the landscape have a diverse background but have the propensity to become a focal point? An edge is a transitional linear place where one space or landscape becomes part of another. An edge has a high absorption due to a diverse background, a low absorption due to the propensity to become a focal point (e.g., city meets country, a woodland edge, an alpine tree line, coastline).	(H) M L
Trees & Vegetation	
Are trees and vegetation in the landscape missing, deficient, or uniform? The greater the density of trees and vegetation, the greater the coverage, the greater the capacity of an area to absorb physical change.	H (M) L
What is the type(s) of tree(s) and vegetation in the landscape? Tree and vegetation types vary the absorption of the physical change. A uniformly tall, dense stand of trees has screening ability. Vegetation types such as evergreen shrubs and similar have greater absorption than dwarf shrubs, ornamental grasses, and grass-like plants. Trees and vegetation can provide high absorption in the foreground but lower absorption in the background.	H M (L)
Disturbed Surface Area	
What is the period of time to restore the project disturbed surface area to its pre-construction activity condition? The longer the time to restore the disturbed area to its undisturbed original condition, the lower the absorption; 1 year = high, 2 to 3 years = moderate, 3 years or more = low.	H (M) L
Adapted from S. Amir, E. Gidalizon, "Expert-based method for the evaluation of visual absorption capacity of the landscape*," Journal of Environmental Management, 1990, Vol. 30, pp. 251-263, and W.C. Yeomans, "A Proposed Biophysical Approach to Visual Absorption Capability (VAC),[1]" Pacific Southwest Forest and Range Experimental Station, Berkeley, California, 1979 submitted to the National Conference on Applied Techniques for Analysis and Management of Visual Resource, Incline Village, Nevada, April 23-25, 1979, pp. 172-181.	

Table 13 MAGNITUDE OF CHANGE				
Dominant	**Prominent**	**Conspicuous**	**Apparent**	**Unobtrusive**
Project commands or controls the view in the landscape. Project causes a very large alteration to the landscape or features within the landscape such that there is a fundamental change from the existing physical environment.	Project stands out or is striking in the view in the landscape. Project causes a large alteration to the landscape or features within the landscape such that there is an unmistakable change from the existing physical environment.	Project is clearly visible and noticeable in the view in the landscape. Project causes a moderate alteration to the landscape or features within the landscape such that there is a distinct change from the existing physical environment.	Project visible or evident in the view in the landscape. Project causes a small alteration to the landscape or features within the landscape such that there is a perceptible change from the existing physical environment.	Project indistinct or not obvious in the view in the landscape. Project causes a very small alteration to the landscape, or features within the landscape such that there is a de minimis change from the existing physical environment.
Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 20.				

Table 14 VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OF SITE AND ITS SURROUNDINGS							
Landscape		**Project Prominence**		**Visual Absorption Capability**	**Magnitude Of Change**		**CEQA Guidelines Level Of Effect On The Environment** (See Table 15)
Table	**Rating**	**Rating**		**Rating**			
Landscape Character	See Table 3	Severe		High	Dominant		Significant Effect
Unity	See Table 4	Strong			Prominent		
Public View	**Low**	Moderate		Moderate	Conspicuous		
Visibility	**Low to Moderate**	**Weak**	√		Apparent		
		Negligible		Low	**Unobtrusive**	√	Less Than Significant Effect

Table 15 CEQA GUIDELINES LEVEL OF EFFECT ON THE ENVIRONMENT

Significant Effect on the Environment "means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic and aesthetic significance." (14 CCR § 15382) (Pub. Res. Code § 21060.5, 14 CCR § 15360) The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, noncompliance with which means the effect will normally be determined to be significant by the [lead] agency...." (14 CCR § 15064.7[a])

Less Than Significant Effect with Mitigation Incorporated. The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "... but (1) revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed [CEQA environmental document (e.g., Negative Declaration) is] released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and (2) there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment." (Pub. Res. Code § 21064.5, 14 CCR § 15369.5) (Pub. Res. Code § 21002)

Less Than Significant Effect. The physical change by the proposed project to the existing physical environment does not reach the threshold of significance "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, ... compliance with which means the effect normally will be determined to be less than significant." (14 CCR § 15064.7[a])

Appendix C

Weatherspark.com Information

APPENDIX C: WEATHERSPARK.COM INFORMATION

Weatherspark.com Information – Niland, California

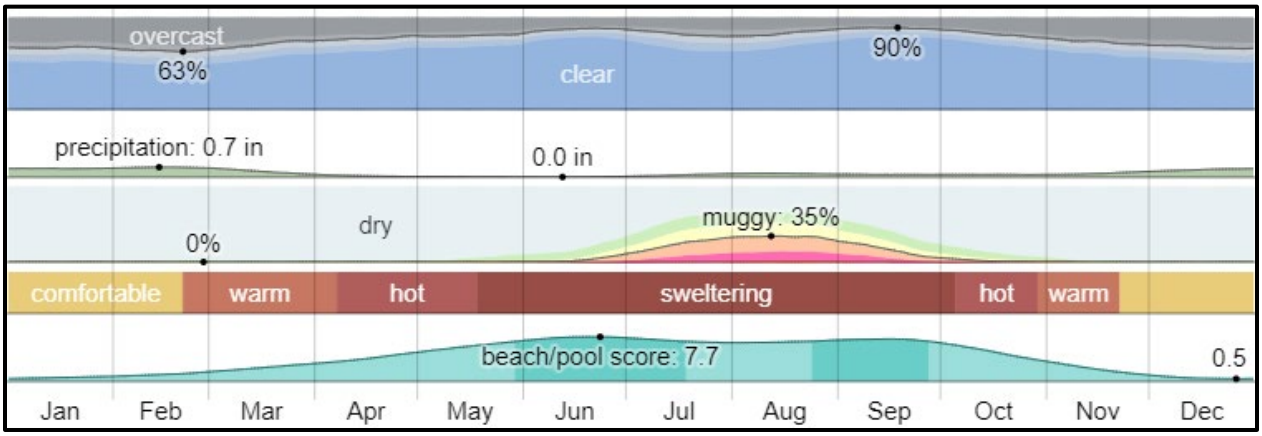
Weatherspark.com offers detailed reports of typical weather from 145,449 locations worldwide. The following information is adapted from Weatherspark.com.

Weatherspark.com is a website developed, own, and operate by Cedar Lake Ventures, Inc. a small company based in Minneapolis, Minnesota that develops, owns, and operates a portfolio of web sites, interactive web-based tools, desktop software, and web APIs.

Climate and Average Weather Year-Round

Over the course of the year, the temperature typically varies between 42 degrees to 107 degrees Fahrenheit. Rarely is it below 35 degrees or above 113 degrees Fahrenheit.

Climate in Niland



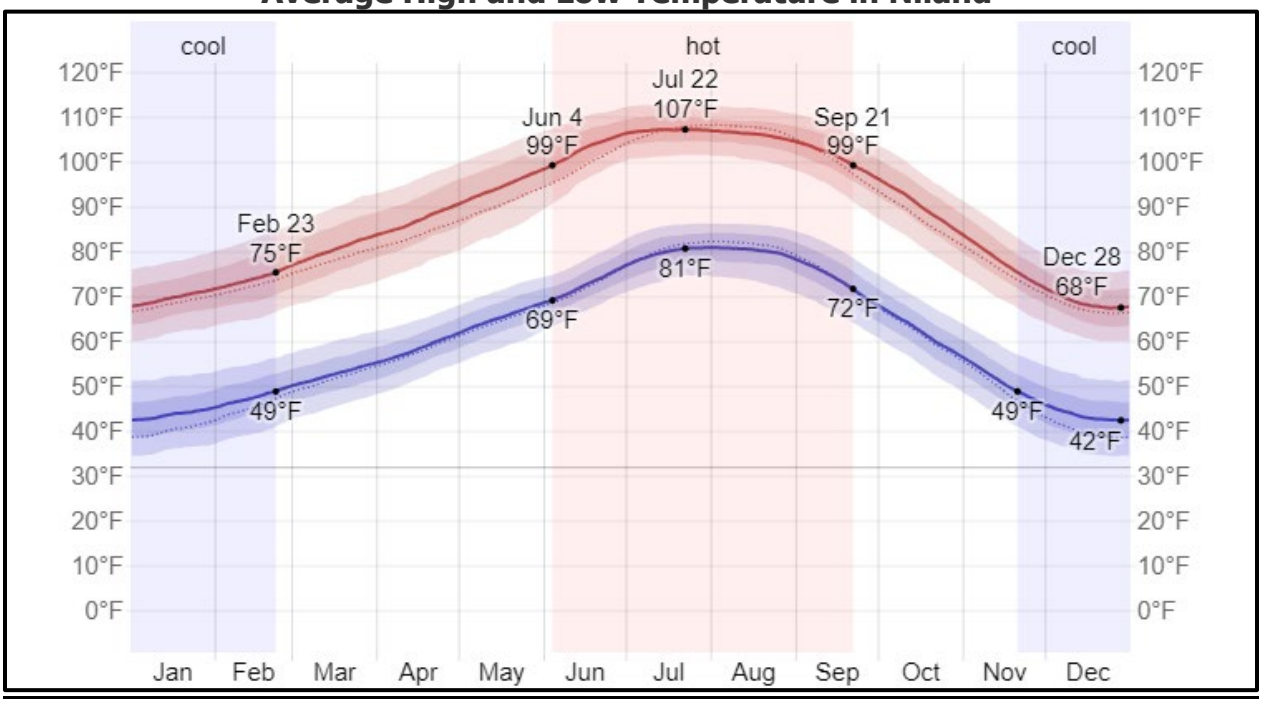
Source: © Weatherspark.com

Average Temperature

The hot season lasts for 3.6 months, June 4 to September 21, with an average daily high temperature above 99 degrees Fahrenheit. The hottest month of the year is July with an average high of 107 degrees and low of 80 degrees Fahrenheit.

The cool season lasts for 3.1 months, November 20 to February 23, with an average daily high temperature below 75 degrees Fahrenheit. The coldest month of the year is December with an average low of 43 degrees and high of 69 degrees Fahrenheit.

Average High and Low Temperature in Niland



Source: © Weatherspark.com

The daily average high (red line) and low (blue line) temperature with 25th to 75th and 10th to 90th percentile bands. The thin dotted lines are the corresponding average perceived temperatures.

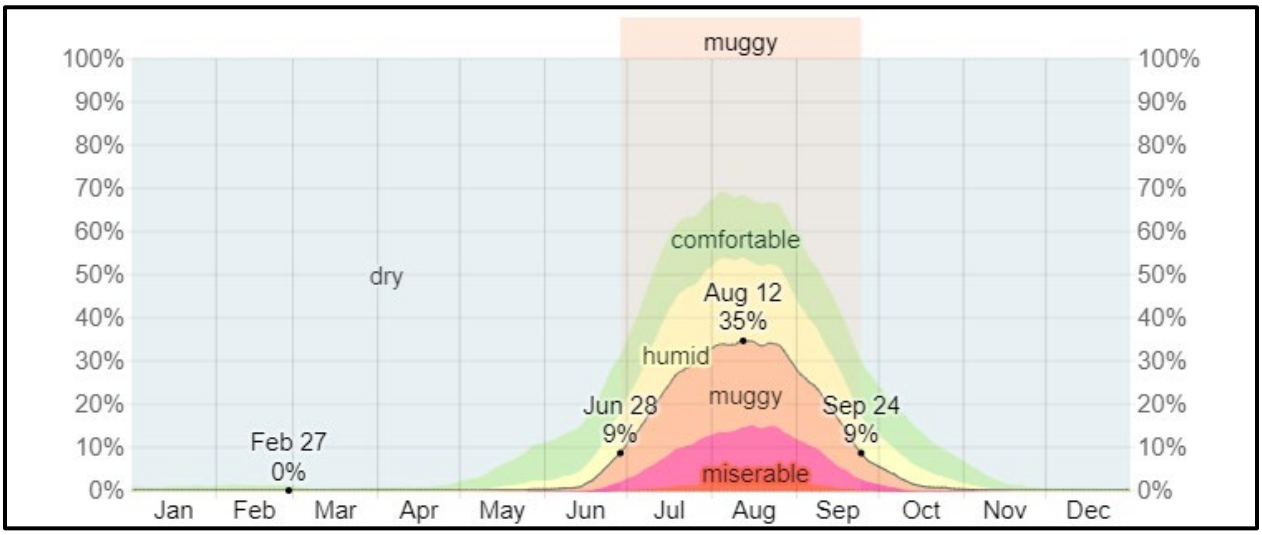
Average	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
High	70°F	74°F	81°F	87°F	95°F	103°F	107°F	106°F	101°F	90°F	77°F	69°F
Temp.	55°F	60°F	66°F	72°F	80°F	88°F	93°F	93°F	87°F	75°F	63°F	54°F
Low	44°F	48°F	53°F	59°F	66°F	73°F	80°F	80°F	73°F	62°F	50°F	43°F

Source: © WeatherSpark.com

Humidity

Niland experiences significant seasonal variation in the perceived humidity. The perceived humidity comfort level is based on the dew point. The muggier period of the year lasts for 2.9 months, June 28 to September 24. The month with the most days muggy is August with 10.3 days. The least muggy day of the year is February 27.

Humidity Levels in Niland



Source: © Weatherspark.com

The percentage of time spent at various humidity comforts levels categorized by dew point.

Data Sources

The Weatherspark.com report illustrates the typical weather in Niland based on a statistical analysis of historical hourly weather reports and model reconstructions from January 1, 1980, to December 31, 2016.

Temperature and Dew Point

There are three weather stations near enough to contribute to our estimation of the temperature and dew point in Niland.

For each station, the records are corrected for the elevation difference between that station and Niland according to the International Standard Atmosphere, and by the relative change present in the MERRA-2 satellite-era reanalysis between the two locations.

The estimated value at Niland is computed as the weighted average of the individual contributions from each station with weights proportional to the inverse of the distance between Niland and a given station.

The stations contributing to this reconstruction are:

- Imperial County Airport (KIPL, 54%, 28 mi, south, 82 ft elevation change)
- Thermal Airport (KTRM, 26%, 46 mi, northwest, 20 ft elevation change)
- Blythe Airport (KBLH, 20%, 53 mi, northeast, 531 ft elevation change)

Other Data

All data relating to the Sun position (e.g., sunrise and sunset) are computed using astronomical formulas from the book Astronomical Algorithms 2nd Edition by Jean Meeus.

All other weather data, including cloud cover, precipitation, wind speed and direction, and solar flux come from the NASA MERRA-2 Modern-Era Retrospective Analysis. This reanalysis combines a variety of wide-area measurements in a state-of-the-art global meteorological model to reconstruct the hourly history of weather throughout the world on a 50-kilometer grid.

Land Use data comes from the Global Land Cover SHARE database published by the Food and Agriculture Organization of the United Nations.

Elevation data comes from the Shuttle Radar Topography Mission (SRTM) published by the NASA Jet Propulsion Laboratory.

Names, locations, and time zones of places and some airports come from the GeoNames Geographical Database.

Time zones for airports and weather stations are provided by AskGeo.com.

Disclaimer

The information on this site is provided as is without any assurances as to its accuracy or suitability for any purpose. Weather data is prone to errors, outages, and other defects. We assume no responsibility for any decisions made on the basis of the content presented on this site.

Appendix D

Draft Provisions for Water Quality

Morton Bay Geothermal Project

Draft Permit Provisions

A. Discharge Prohibitions

1. The Discharger shall not discharge wastes to the Class II Surface Impoundment (Waste Management Unit or Unit) that have the potential to reduce or impair the integrity of containment structures or which, if commingled with other wastes in the Unit, could produce violent reaction, heat or pressure, fire or explosion, toxic by-products, or reaction products, which, in turn: require a higher level of containment than provided by the unit; or impair the integrity of containment structures. (Title 27, § 20200, subd. (b).)

2. Except as otherwise authorized under this Permit, the Discharger shall not discharge or release any wastes to any areas outside of the Unit. This prohibition specifically includes, without limitation, the discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater. This prohibition does not include discharges via injection wells that are separately regulated under the Department of Conservation, Geologic Energy Management (CalGEM).

3. “Hazardous Waste,” as defined per California Code of Regulations, title 23 (Title 23), section 2510 et seq., shall not be discharged to the Unit or any other portion of the Facility.

4. The pressure head on any secondary liner shall not be permitted to exceed one foot, except for Leachate Collection and Removal System (LCRS) sump area where liquid depth shall be kept at the minimum needed for safe pump operation.

5. Wastes shall not be discharged to the Unit until Colorado River Basin Water Board staff have approved the Discharger’s Construction Quality Assurance (CQA) Report, as provided in Section C.4.

B. General Facility Requirements

1. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the requirements prescribed herein.

2. The Discharger shall maintain the depth of the fluid in the sump of each Unit at the minimum needed for efficient pump operation (the depth at which the pump turns on given the pump intake height and maximum pump cycle frequency).

C. Unit Siting, Design and Construction Requirements

1. Compliance with Title 27 Prescriptive Standards

Except as authorized as an "Engineered Alternative" by the Colorado River Water Board Executive Officer (see Section 2), each Unit shall be designed and constructed in accordance with Title 27 prescriptive standards, including those set forth in Title 27, section 20310 et seq.

2. Submittals for New Units at Facility

For each new Unit at the Facility, the Discharger shall submit, for Colorado River Basin Water Board Executive Officer approval,[1] all design plans and specifications at least 90 days prior to the anticipated construction date. The submittal shall include the following components:

a. Geotechnical evaluation of the area soils, evaluating their use as the base layer (Title 27, § 21750, subd. (f)(4));

b. Detailed construction drawings showing all required liner system components, the required LCRS, the leachate sump, and means of access to the LCRS for required annual testing;

c. For any proposed Engineered Alternatives to a Title 27 construction or prescriptive standard, all of the necessary demonstrations for approval pursuant to Title 27, section 20080, subdivisions (b)-(c);

d. A Construction Quality Assurance (CQA) Plan prepared by a California-registered civil engineer or certified engineering geologist, and that meets the requirements of Title 27, section 20324, as well as section C.4 herein;

e. Information about the seismic design of the proposed new Unit, in accordance with Title 27, section 20370;

f. A Water Quality Monitoring Plan (WQMP) for groundwater, unsaturated zone and surface water detection monitoring, in accordance with Title 27, section 20415, and section H.2 herein;

[1] Approval shall be limited to whether the proposed design complies with the prescriptive standards of Title 27, or in the case of an "Engineered Alternative," whether the Discharger has made the required demonstrations described in Title 27, section 20080, subdivisions (b)-(c)

g. An Operation Plan meeting the requirements of Title 27, sections 21760(b) and 20375(b);

h. A Preliminary Closure Plan that meets the requirements described in Title 27, sections 21750 and 21769, as well as those set forth in Section E herein;

i. Financial assurance cost estimates for the activities proposed in the Discharger's Preliminary Closure Plan, as well as for corrective action to address a release, as described in Section G.

3. Siting Restrictions

a. No Unit shall be sited within 200 feet of any known Holocene fault. (Title 27, § 20250, subd. (d).)

b. No Unit shall be sited within a 100-year floodplain. (Title 27, § 20250, subd. (c).)

c. Units shall be sited so as to ensure at least five feet of separation between the bottom of the Unit and the highest anticipated elevation of underlying groundwater. (Title 27, § 20240, subd. (c).)

4. Construction Quality Assurance (CQA)

a. For each Unit, the Discharger shall establish and implement a Construction Quality Assurance (CQA) Program to demonstrate that materials and procedures utilized in the placement of the any Unit containment feature are tested and monitored in such a manner as to ensure that the containment feature structure is constructed in accordance with the design specifications approved by the Colorado River Basin Water Board. (Title 27, § 20324, subd. (a.)

b. CQA Programs shall be supervised by a registered civil engineer or a certified engineering geologist, designated as the "CQA Officer." (Title 27, § 20324, subd. (b)(2).)

c. The Discharger shall propose an electronic leak location survey of the top liner for new Units in the CQA Plan unless the Discharger demonstrates that a leak location survey is not needed.

d. The Discharger shall not commence field construction activities for a new Unit until after the Colorado River Basin Water Board's Executive Officer has approved each of the required submittals listed in section C.2 above.

e. Each Unit shall be constructed in accordance with the CQA Plan certified by the CQA Officer. (Title 27, § 20323; see also § C.2.d, above.)

f. The Discharger shall notify Colorado River Basin Water Board staff at least 14 days prior to commencing field construction activities for existing and new Units, or any other construction for which Executive Officer approval is required.

g. Following the completion of construction activity for a new Unit, but at least 60 days prior to discharge, the Discharger shall submit, for review and approval, the Final Documentation described in subdivision (d)(1)(C) of Title 27, section 20324. This submittal shall be certified by the CQA Officer described in section C.4.b above, and demonstrate that the new Unit:

   i. Was constructed in accordance with the approved design plans and specifications, the CQA Plan and any other relevant provisions herein; and

   ii. Meets the applicable Title 27 performance standards, as set forth in section 20310 et seq.

h. Waste shall not be discharged to a new Unit until each of the following has occurred:

   i. The Unit has been subject to a final inspection and approval by Colorado River Basin Water Board staff. (Title 27, § 20310, subd. (e))

   ii. The Final Documentation, as described in section C.4.g, has been reviewed and approved by the Colorado River Basin Water Board's Executive Officer.

i. All containment structures shall be designed by, and construction shall be supervised by, a California registered civil engineer or a certified engineering geologist, and shall be certified by that individual as meeting the applicable Title 27 prescriptive standards, or an approved engineered alternative design.

5. General Unit Design Requirements

a. Units shall be designed, constructed and maintained to withstand a 1,000-year, 24-hour storm event without failure (Title 27, § 21750, subd. (e)(3)), and to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and

overtopping under the precipitation conditions for the unit (Title 27, § 20365, subd. (a)).

b. Any submittal to the Colorado River Basin Water Board or other regulatory agency that proposes a design or design change potentially affecting a Unit's containment features or monitoring systems shall be prepared by a California registered civil engineer or a certified engineering geologist (Qualified Professional), or under supervision of a Qualified Professional. (Title 27, § 21710, subd. (d).)

c. Materials used in containment structures shall have appropriate chemical and physical properties to ensure that such structures do not fail to contain waste because of pressure gradients, physical contact with waste or leachate, chemical reactions with soil or rock, climatic conditions, the stress of installation, or because of the stress of daily operations. (Title 27, § 20320, subd. (a).)

d. Units and their respective containment structures shall be designed and constructed to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and overtopping. (Title 27, § 20365, subd. (a).)

e. All Units shall be designed to withstand a maximum credible earthquake without damage to the foundation or to the structures that control leachate, or surface drainage, or erosion. (Title 27, § 20370, subd. (a).)

f. Units shall be designed and constructed with liners to contain the fluid, including waste, and leachate. (Title 27, § 20330, subd. (a).)

g. Hydraulic conductivities specified for Unit containment structures shall be relative to the fluids contained within the Unit. (Title 27, § 20320, subd. (b).)

h. Hydraulic conductivities shall be determined by appropriate field test methods in accordance with accepted civil engineering practice. Results of laboratory tests with both water and leachate, and field tests with water, shall be compared to evaluate how the field permeabilities will be affected by leachate. The Discharger may use appropriate compaction tests in conjunction with laboratory hydraulic conductivity tests to determine field permeabilities as long as a reasonable number of field hydraulic conductivity tests are also conducted. (Title 27, § 20320, subd. (c).)

i. A test pad for each barrier layer and any final cover shall be constructed in a manner duplicating the field construction. Test pad construction methods, with the designated equipment, shall be

used to determine if the specified density/moisture-content/hydraulic conductivity relationships determined in the laboratory can be achieved in the field with the compaction equipment to be used and at the specified lift thickness. (Title 27, § 20324, subd. (g)(1)(A).)

j. For any liner system that includes a geocomposite liner (GCL) material, the Discharger shall ensure proper preparation of the subgrade so as to provide a smooth surface that is free from rocks, sticks, or other debris that could damage or otherwise limit the performance of the GCL.

k. The LCRS shall be designed, constructed, maintained, and operated to:

i. Collect and remove twice the maximum anticipated daily volume of leachate (Title 27, § 20340, subd. (b)); and

ii. Function without clogging through the Unit's operating life.

l. The leachate sump, leachate removal pump, and pump controls shall be designed and set to maintain a fluid depth no greater than the minimum needed for efficient pump operation. (Title 27, § 20340, subd. (c).)

D. Unit Operating Requirements

1. All Units shall be designed, constructed, and operated to ensure that wastes, including leachate, will be a minimum of five feet above the highest anticipated elevation of underlying groundwater, including the capillary fringe. (Title 27, § 20240, subd. (c).)

2. The Discharger shall operate and maintain each Unit so as to ensure that sufficient freeboard is maintained to accommodate seasonal precipitation, as well as a 1,000-year, 24-hour storm event (Design Storm), and in no event less than two feet of freeboard (as measured vertically from the water surface up to the lowest elevation point on the surrounding lined berm/dike). (Title 27, § 20375, subd. (a).)

E. Unit Closure Requirements

1. **General Closure Requirements.** All Units at the Facility shall be clean-closed, or alternatively, closed as a landfill, in accordance with the requirements of Title 27. Closure shall be conducted in the most expeditious manner that is practicable under the circumstances once a Unit is no longer needed for waste disposal or storage purposes.

2. **Removal of Free Liquids.** Except as approved in writing by the Colorado River Basin Water Board Executive Officer, once waste is no longer being discharged to a Unit, and storage is no longer necessary, all remaining free liquid contents shall be removed and disposed at a permitted waste management facility. (Title 27, § 21400, subd. (a).)

3. **Clean-Closure Standards.** Unless otherwise approved in writing by the Colorado River Basin Water Board Executive Officer (see Section E.5), the Discharger shall undertake "clean-closure" of the Unit, as described in Title 27, section 21400, subdivision (b)(1):

    a. All residual wastes (including sludges, precipitates, settled solids, and liner materials contaminated by wastes) shall be completely removed from the Unit and disposed at a permitted solid waste facility;

    b. Remaining containment features shall be inspected for contamination and, if not contaminated, can be dismantled;

    c. Any natural geologic materials beneath or adjacent to the closed impoundment that have been contaminated shall be removed for disposal at an appropriate Unit; and

    d. The Discharger shall take any additional activities required to meet the applicable performance standard—i.e., the removal of all waste and contaminated materials from the Unit, as well as from the underlying and surrounding environs, such that the waste and Unit no longer poses a threat to water quality. (Title 27, § 20950, subd. (a)(2)(B).)

4. **Preliminary Closure Plan.** In addition to the required information described in Title 27, sections 21750 and 21769, the Preliminary Closure Plan shall also specify the anticipated timeline for closure following the cessation of discharges to any given Unit. Specifically, the Discharger shall identify the amount of time needed for storage of waste within the Unit, following the cessation of discharges, before closure activities can occur. The Discharger shall periodically update its Preliminary Closure Plan as necessary to reflect any changes to anticipated closure activities (e.g., based on changing operations).

5. **Final Closure Plan.** Upon the cessation of waste discharges to a Unit, the Discharger shall submit, for Colorado River Basin Water Board Executive Officer review and approval, a Final Closure Plan for that Unit. The Final Closure Plan shall meet the requirements of Title 27, section 21769. The Discharger shall not commence closure activities until after the Final Closure Plan has been approved by the Executive Officer.

If the Discharger intends to close the Unit as a "landfill," the Discharger shall include a technical demonstration that clean-closure would be infeasible, as described in Title 27, section 21400. In the event that the Colorado River Basin Water Board staff concur with the Discharger's technical demonstration and the Executive Officer approves closure as a "landfill," the Executive Officer shall direct the Discharger to submit a Report of Waste Discharge (ROWD) for separate Waste Discharge Requirements (WDRs) for closure as a landfill and post-closure maintenance.[2]

F. Corrective Action Requirements

1. In the event of a verified release from the Unit (see § H.3.g), the Discharger shall comply with any Cleanup and Abatement Orders issued by the Colorado River Basin Water Board or its Executive Officer pursuant to Water Code section 13304.[3]

2. Under the supervision of Colorado River Basin Water Board staff, the Discharger shall evaluate, monitor and remediate any confirmed releases from a Unit at the Facility in accordance with Title 27, section 20430.

G. Financial Assurance Requirements

1. For each Unit at the Facility, the Discharger shall establish and maintain an irrevocable trust fund or other authorized mechanism[4] to provide financial assurances of their ability to pay for the following, consistently with the most recently updated cost estimate provided annually to the Colorado River Basin Water Board per section I.2.l herein:

---

[2] In the event that the Discharger elects to close the Unit as a "landfill" (in lieu of clean-closure), the Unit's closure, monitoring and post-closure maintenance will be separately regulated by Colorado River Basin Water Board waste discharge requirements under the Porter-Cologne Water Quality Control Act and Title 27. Such activities are outside the scope of this Certification.

[3] This Certification constitutes a "waste discharge requirement … issued by a regional board" for the purposes of Water Code section 13304, subdivision (a).

[4] For purposes of this section, an "authorized mechanism" is a mechanism described in Title 27, sections 22240–22254, and one that is specifically applicable to the subject category of activities. For example, the "Financial Means Test" (§ 22246) cannot be used to provide financial assurances for closure activities.

a. Closure activities described in the approved Preliminary Clean-Closure Plan (§§ C.2.h, E.4), or as applicable, the approved Final Clean-Closure Plan (§ E.5); and

b. Corrective action to address a reasonably foreseeable release to the unsaturated zone, groundwater or surface waters in accordance with the provisions of Title 27, section 20380 et seq. (Title 27, §§ 22207, 22222.)

2. The Colorado River Basin Water Board shall be designated as the beneficiary of any mechanisms established by the Discharger pursuant to these permit provisions.

3. The Discharger shall comply with the applicable provisions of Title 27, section 22225 et seq., regarding the establishment and maintenance of financial assurances mechanisms generally.

H. Monitoring Requirements[5]

1. Sample Collection and Analysis Plan (SCAP)

a. The Discharger shall submit, for Colorado River Basin Water Board Executive Officer approval,[6] a Sample Collection and Analysis Plan (SCAP), which includes the following elements:

i. Sample collection procedures, describing purging techniques, sampling equipment, and decontamination of sampling equipment;

ii. Sample preservation information and shipment procedures;

iii. Sample analytical methods and procedures;

iv. Sample Quality Assurance/Quality Control (QA/QC) procedures;

v. Chain of Custody Control; and

[5] In the event that the Colorado River Basin Water Board issues a Monitoring and Reporting Program (MRP) pursuant to Water Code section 13267, subdivision (b)(1), the provisions of this section shall be superseded by the Board's MRP.

[6] The Executive Officer may require that the Discharger submit a Revised SCAP with specified revisions. Upon approval, the SCAP shall be implemented for all applicable monitoring activities at the Facility.

vi. Sample analysis information including sample preparation techniques to avoid matrix interferences, method detection limits (MDLs), practical quantitation limits (PQLs) and reporting limits (RLs), and procedures for reporting trace results between the MDL and PQL.

b. All samples shall be collected, preserved, and transported in accordance with the approved SCAP, and the QA/QC standards specified therein. The Discharger may use alternative methods (including new USEPA approved methods), provided that the methods have MDLs equal to or lower than the analytical methods specified herein and are identified in the approved SCAP.

2. Water Quality Monitoring Plan.

a. For each proposed new Unit, the Discharger shall submit, for Colorado River Basin Water Board Executive Officer review and approval, a Water Quality Monitoring Plan (WQMP) that contains all of the information described in Title 27, section 21760, subdivision (a)(3), including:

i. Mapped locations of proposed Monitoring Points (including those for background and point of compliance) for groundwater, the unsaturated zone and surface water;

ii. Detailed plans and equipment specifications for compliance with Title 27 groundwater, unsaturated zone and surface water monitoring requirements (see § 20380 et seq.), as well as any additional requirements prescribed herein; and

iii. A technical justification for the spatial distribution of Monitoring Points for each monitored medium under section 20415, subdivisions (b)-(e), and for the selection of other monitoring equipment.

b. Additional Demonstrations

i. If the Discharger seeks an exemption from unsaturated zone monitoring requirements, the Discharger shall demonstrate that there is no unsaturated zone monitoring device or method capable of operating under the subsurface conditions. (Title 27, § 20415, subd. (d)(5).)

ii. If the Discharger seeks to use an alternative method of unsaturated zone monitoring (i.e., in lieu of a lysimeter or other soil-pore collection device), the Discharger shall

demonstrate that soil-pore collection cannot provide an indication of a release. (Title 27, § 20415, subd. (d)(4).)

iii. If the Discharger seeks an exemption from surface water monitoring, the Discharger shall also include a demonstration that there are no adjacent waterbodies that could be affected by a release. (Title 27, § 20415, subd. (c)(1).)

3. Detection Monitoring Program (DMP)

a. **General Requirements.**

i. To detect a release at the earliest possible opportunity (Title 27, § 20420, subd. (b)), the Discharger shall implement a Detection Monitoring Program (DMP) for groundwater, the unsaturated zone and surface water in accordance with the provisions of Title 27, particularly sections 20415 and 20420.[7] A separate DMP is required for each Unit.

ii. The groundwater detection monitoring network shall include a sufficient number of monitoring points, installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the Point of Compliance (POC) to allow the detection of a release from the Unit at the earliest possible opportunity. (§ 20415, subd. (b)(1)(B)1.) Additional points shall be added as necessary to provide the best assurance of the earliest possible detection. (§ 20415, subd. (b)(1)(B)2.) The network shall also include a sufficient number of monitoring points installed at appropriate depths and locations to yield groundwater samples from other aquifers or perched zones not already monitored. (§§ 20415(b)(1)(B)3-4, 20420(b).)

iii. Additional monitoring points shall be added as necessary to provide the best assurance of the earliest possible detection of a release. (Title 27, § 20415, subd. (b)(1)(B)2.)

iv. The groundwater monitoring system shall include a sufficient number of monitoring points, installed at appropriate locations and depths, to yield groundwater samples from the

[7] The Colorado River Basin Water Board Executive Officer may waive detection monitoring for the unsaturated zone and/or surface waters, based on demonstrations in the WQMP per Section H.2 herein. (See Title 27, § 20415, subds. (c)(1), (d)(5).)

uppermost aquifer and any perched groundwater that represent the quality of groundwater that has not been affected by a release from each Unit. (Title 27, §§ 20415(b)(1)(A)-(B), 20420(b).)

b. **Groundwater Detection Monitoring**

i. **Monitoring Parameters.** All groundwater monitoring wells shall be sampled and analyzed for the Monitoring Parameters[8] in Table 1, in accordance with the specified monitoring frequencies. (Title 27, § 20420, subds. (e)-(f).) Whenever a monitoring well is sampled (i.e., any additional sampling events), groundwater elevation, temperature, electrical conductivity, turbidity, and pH shall be accurately measured at each well. (Title 27, § 20415, subd. (e)(13).)

ii. **Five-Year Constituents of Concern.** Every five years, the Discharger shall analyze groundwater samples for the "CAM-17 Metals" listed in California Code of Regulations, title 22 (Title 22), section 66261.24, which constitute the Unit's Constituents of Concern (COCs) for purposes of Title 27, section 20395, subdivision (a).[9] Results of such monitoring shall be reported in the next Semiannual Monitoring Report.

iii. **Groundwater Conditions Monitoring.** Each quarter, the Discharger shall monitor Groundwater Conditions in Table 1. To the extent feasible, this information shall be determined separately for: (1) the uppermost aquifer; (2) any zones of perched water; and (3) any additional zone of saturation monitored based upon water level elevations taken prior to the collection of the water quality data submitted in the report. (Title 27, § 20415, subd. (e)(15).)

[8] Monitoring Parameters are "physical parameters, hazardous constituents, waste constituents, and reaction products that provide a reliable indication of a release from the Unit…" (Title 27, § 20420, subd. (e).).

[9] COCs are the list of "waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the Unit." (Title 27, § 20395, subd. (a).)

Table 1. Monitoring Parameters for Groundwater and Unsaturated Zone.[10]

Monitoring Parameter	Units	GeoTracker Code	Monitoring Freq.	Reporting Freq.
Temperature	°F	TEMP	Semiannually	Semiannually
Electrical Conductivity	µmhos/cm	SC	Semiannually	Semiannually
pH	SU	PH	Semiannually	Semiannually
Turbidity	NTU	TURB	Semiannually	Semiannually
Total Dissolve Solids (TDS)	mg/L	TDS	Semiannually	Semiannually
Arsenic	µg/L		Semiannually	Semiannually
Barium	µg/L		Semiannually	Semiannually
Cadmium	µg/L		Semiannually	Semiannually
Lead	µg/L		Semiannually	Semiannually
Zinc	µg/L		Semiannually	Semiannually
General Chemistry Constituents (Ca, Mg, Na, K, SO_4, Cl, HCO_3)	mg/L		Semiannually	Annually

Table 2. Groundwater Conditions Monitoring.

Conditions	Units	GeoTracker Code	Monitoring Freq.	Reporting Freq.
Elevation (Well-Specific)	ft bgs	ELEV	Quarterly	Semiannually
Gradient / Direction	-	(none)	Quarterly	Semiannually
Flow Rate		(none)	Quarterly	Semiannually
Groundwater Density	kg/L	(none)	Semiannually	Semiannually

[10] The Monitoring Parameters in Table 1 are based on those of other geothermal generating stations within the Colorado River Basin Region.

c. **Unsaturated Zone Detection Monitoring**[11]

i. **Monthly Inspection.** Each month, the Discharger shall inspect each unsaturated zone monitoring device for soil-pore liquid.

ii. **Monitoring Parameters.** Any liquid detected in an unsaturated zone monitoring device during the inspection shall be sampled and analyzed for the Monitoring Parameters in Table 1, in accordance with the specified monitoring frequencies. (Title 27, § 20420, subds. (e)-(f).)

iii. **Initial Detection of Liquid.** The Discharger shall notify Colorado River Basin Water Board staff within seven days of detecting liquid in a previously dry unsaturated zone monitoring device.

iv. **Five-Year Constituents of Concern.** Every five years, the Discharger shall analyze liquid samples (if is present within the period) for the "CAM-17 Metals" listed in Title 22, section 66261.24, which constitute the Unit's Constituents of Concern (COCs) for purposes of Title 27, section 20395, subdivision (a). Results of such monitoring shall be reported in the next Semiannual Monitoring Report.

d. **Surface Water Detection Monitoring**[12]

i. **Monitoring Parameters.** Whenever surface water is present at any of the approved monitoring points at any point during the monitoring period, samples shall be collected from each monitoring point and analyzed for the Monitoring Parameters in Table 1, in accordance with the monitoring specified frequencies. (Title 27, § 20420, subds. (e)-(f).)

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[11] The Colorado River Basin Water Board Executive Officer may waive unsaturated zone monitoring under this section, or approve an alternative monitoring method in lieu of soil-pore liquid collection. (Title 27, § 20415, subds. (d)(4)-(5).) In the event that an alternative method is approved, the Discharger shall comply with the requirements specified by the Executive Officer, which shall be incorporated herein (i.e., in lieu of the provisions in this section).

[12] Monitoring under this section may be waived in writing by the Colorado River Basin Water Board Executive Officer based on a demonstration that there are no adjacent waterbodies that could be affected by a release from the Unit. (Title 27, § 20415, subd. (c)(1).)

ii. **Five-Year Constituents of Concern.** Every five years, the Discharger shall collect and analyze surface water samples for the "CAM-17 Metals" listed in Title 22, section 66261.24, which constitute the Unit's Constituents of Concern (COCs) for purposes of Title 27, section 20395, subdivision (a). Results of such monitoring shall be reported in the next Semiannual Monitoring Report.

e. **Establishment of Concentration Limits**

i. Prior to discharging waste to a Unit, the Discharger shall establish an initial Concentration Limit (i.e., background value) for each Monitoring Parameter and Constituent of Concern (COC) at each Monitoring Point at the Point of Compliance (POC), in accordance with the statistical methods in subdivision (e)(8) of Title 27, section 20415.[13] (Title 27, § 20400, subds. (a), (b).). The initial Concentration Limits shall be determined based on the monitoring data collected prior to discharge to the Unit.

ii. Updated Concentration Limits shall be proposed by the Discharger on an annual basis, and submitted via the Annual Monitoring Report. Unless expressly rejected by the Colorado River Basin Water Board's Executive Officer in writing, the updated Concentration Limits shall be used to determine whether there has been a release from the Unit.

iii. If the Discharger fails to submit updated Concentration Limits, the existing ones shall remain operative, provided that, where appropriate, the Colorado River Basin Water Board's Executive Officer may revert to lower concentrations where so warranted by existing monitoring data.

f. **Procedures to Confirm Evidence of Release**

i. **Verification Sampling after Detection of Constituent of Concern.**

Whenever a COC is detected at a DMP Monitoring Point at a concentration exceeding the applicable Concentration Limit the Discharger shall conduct verification sampling to confirm if the exceedance is due to a release, or if it is a false-

[13] The Concentration Limit for organic compounds that are neither naturally occurring, nor detected in background groundwater samples, shall be taken as the detection limit of the analytical method used (e.g., USEPA Methods 8260, 8270).

positive (unless previous monitoring has already confirmed a release for that constituent at that monitoring point). An exceedance of the Concentration Limit shall be considered "measurably significant evidence of a release" that shall be either confirmed or denied through the applicable verification procedure specified below.

ii. **Procedure for Analytes Detected in Less than 10 Percent of Background Samples (Non-Statistical Method).**

Step 1: Initial Determination. The Discharger shall identify each analyte in the current DMP Monitoring Point sample that exceeds either its respective MDL or PQL, and for which a release has not been previously confirmed. The Discharger shall conclude that the exceedance provides a preliminary indication of a release or a change in the nature or extent of the release, at that monitoring point, if either: (i) The data contains two or more analytes that equal or exceed their respective MDLs; or (ii) the data contains one or more analyte that equals or exceeds its PQL.

Step 2: Notification to Board Staff. Upon determining that there is a preliminary indication of a release, the Discharger shall immediately notify Board staff by phone or email (not required if Board staff made the determination in writing and notified Discharger).

Step 3: Discrete Retest. Within 30 days of either the Discharger or the Board determining that there is a preliminary indication of a release, the Discharger shall collect two new (retest) samples from the relevant monitoring point(s), and analyze the samples for COCs at issue. (Title 27, §§ 20415(e)(8)(E), 20420(j)(1)-(3).)

Step 4: Confirmation of Release. As soon as the retest data are available, the Discharger shall conclude that measurably significant evidence of a release is confirmed if (not including the original sample) two or more analytes equal or exceed their respective MDLs or if one or more analyte equals or exceeds its PQL. The Discharger shall then immediately verbally notify the Board whether or not the retest confirmed measurably significant evidence of a release for the analyte at the monitoring point, and follow up with written notification submitted by certified mail within seven days of the verbal notification.

iii. **Procedure for Analytes Detected in 10 Percent or More of Background Samples (Statistical or Non-Statistical Method).**

Step 1: Initial Determination. The Discharger shall compare the value reported by the laboratory for each analyte to the statistically-derived Concentration Limit from the most recent report (e.g., Annual Report or WQPS Report) that uses the approved statistical procedure. If the value exceeds the Concentration Limit for that analyte, the Discharger shall conclude that there is "measurably significant evidence of a release." (Title 27, § 20420, subd. (i).)

Step 2: Notification to Board Staff. Upon determining that there is a preliminary indication of a release, the Discharger shall *immediately notify Board staff* by phone or email (not required if Board staff made the determination in writing and notified Discharger).

Step 3: Retest Method. Within 30 days of either the Discharger or the Board determining that there is a preliminary indication of a release, the Discharger shall implement a verification procedure/retest option in accordance with Title 27, section 20415, subdivision (e)(8)(E) and section 20420, subdivision (j)(2). (Title 27, §§ 20415(e)(8)(E), 20420(j).) The verification procedure shall include either a single "composite" retest (i.e., a statistical analysis that augments and reanalyzes the data from the monitoring point that indicated a release), or shall consist of at least two "discrete" retests (i.e., statistical analyses each of which analyzes only newly acquired data from the monitoring point that indicated a release). (Title 27, § 20415, subd. (e)(8)(E).) The Discharger may use an alternate method previously approved in writing by the Board. The verification procedure shall comply with the requirements of Title 27, section 20415, subdivision (e)(8)(E), in addition to the performance standards of section 20415, subdivision (e)(9).

The retest samples shall be collected from the monitoring point where the release is preliminarily indicated and shall be analyzed for the constituents that caused the need for the retest. For any indicated monitoring parameter or constituent of concern, if the retest results of one or more of the retest data suites confirm the original indication, the Discharger

shall conclude that measurably significant evidence of a release has been confirmed.

The Discharger shall then *immediately verbally notify the Board* whether or not the retest confirmed measurably significant evidence of a release for the analyte at the monitoring point, and follow up with written notification submitted by certified mail within seven days of the verbal notification.

iv. **Next Steps After Confirmation.** If a release has been confirmed under either of the procedures above, the Discharger shall comply with the Response to Release Requirements in Section H.3.g below. If the analyte at issue is a Five-Year COC, that analyte shall be added to list of Monitoring Parameters that are monitored on a more frequent basis.

v. **Physical Evidence of a Release.** If the Discharger determines that there is a significant physical evidence of a release, the Discharger shall immediately verbally notify Colorado River Basin Water Board staff and provide written notification by certified mail within seven days of such determination. (Title 27, §§ 20385(a)(3), 20420(l)(1)-(2).)

g. **Response to Release Requirements**

i. If the Discharger confirms that there is "measurably significant evidence of a release" per Section A.1.a.ii or A.1.a.iii, the Discharger shall comply with the time schedule of required actions in Table 3 below.

ii. If the Discharger confirms that there is measurably significant evidence of a release from the Unit at any monitoring point, the Discharger may attempt to demonstrate that a source other than the Unit caused the evidence of a release or that the evidence is an artifact caused by an error in sampling, analysis, or statistical evaluation or by natural variation in groundwater, surface water, or the unsaturated zone.

iii. The Discharger may make a demonstration pursuant to section 20420, subdivision (k)(7); however, the Discharger is not relieved of the requirements and due dates of Title 27, sections 20420, subdivision (k)(6)-(7), unless Colorado River Basin Water Board staff concur that the demonstration successfully shows that a source other than the Unit caused

the evidence of a release or that the evidence resulted from error in sampling, analysis, or statistical evaluation or from natural variation in groundwater, surface water, or the unsaturated zone.

iv. In order to make this demonstration, the Discharger shall notify the Board by certified mail of the intent to make the demonstration **within seven days** of determining measurably significant evidence of a release, and shall submit a report **within 90 days** of determining measurably significant evidence of a release. (Title 27, § 20420, subd. (k)(7).)

Table 3. Time Schedule of Required Actions After Confirming Measurably Significant Evidence of Release.

Deadline	Required Action
Immediately after Confirmation	*Additional Sampling* The Discharger shall sample all monitoring points in the affected medium at that Unit and determine the concentration of all monitoring parameters and constituents of concern for comparison with established concentration limits (CLs). Because this constituent of concern (COC) scan does not involve statistical testing, the Discharger will need to collect and analyze only a single water sample from each monitoring point in the affected medium (Title 27, § 20420, subd. (k)(1))
Within 90 Days of Confirmation	*Submit Evaluation Monitoring Program* The Discharger shall submit a technical report with a proposed Evaluation Monitoring Program (EMP) in accordance with Title 27, section 20420, subdivision (k)(5)(A)-(D), and incorporating the results of the immediate post-confirmation sampling activities required above. Specifically, the EMP shall be designed for the collection and analysis of all data necessary to assess the nature and extent of the release and to determine the spatial distribution and concentration of each constituent throughout the zone affected by the release. (Title 27, §§ 20420(k)(5), 20425(b).) The EMP is subject to Executive Officer approval, including with specified revisions. The EMP shall be considered established upon its approval.

Deadline	Required Action
Within 180 Days of Confirmation	*Submit Corrective Action Feasibility Study* The Discharger shall submit, for Executive Officer approval, an initial engineering feasibility study for a Corrective Action Program necessary to meet the requirements of Title 27, section 20430. At a minimum, the feasibility study shall contain a detailed description of the corrective action measures that could be taken to achieve background concentrations for all constituents of concern. (Title 27, § 20420, subd. (k)(6).)
Within 90 Days of EMP Approval	The Discharger shall complete and submit the following: (1) Technical Report with EMP results and assessment. (Title 27, § 20425, subd. (b).) (2) Updated Engineering Feasibility Study for corrective action based on data collected to delineate the release and data from the ongoing monitoring program per Title 27, section 20425, subdivision (e). (Title 27, § 20425, subd. (c).) (3) Proposed Corrective Action Program in accordance Title 27, section 20430, based on data collected to delineate the release the updated engineering feasibility study. (Title 27, § 20425, subd. (d).)

4. Additional Facility Monitoring

a. **Freeboard Monitoring.** To ensure that adequate capacity is maintained (see Title 27, § 20375, subd. (a)), the Discharger shall record each Unit's available freeboard on a daily basis. These measurements shall be used to calculate an average daily freeboard value for each month. Results shall be reported semiannually.

b. **Geothermal Solids Monitoring.** Whenever solid waste is removed from a Unit for final disposal offsite, the Discharger shall conduct monitoring in accordance with Table 4, and report the results annually.

Table 4. Geothermal Solids Monitoring.

Category	Units	Method	Reporting Freq.
Volume of Solids Removed	Tons	Estimate	Annually
Final Disposal Location	Facility Name, Location	Not Applicable	Annually
Volume of Remaining Solids	Gallons	Estimation	Annually
Arsenic	µg/kg	Grab Sample	Annually
Barium	µg/kg	Grab Sample	Annually
Cadmium	µg/kg	Grab Sample	Annually
Lead	µg/kg	Grab Sample	Annually
Zinc	µg/kg	Grab Sample	Annually

c. **Geothermal Wastewater Monitoring.** The Discharger shall monitor wastewater discharged to Units in accordance with Table 5 and Table 8.

Table 6. Geothermal Wastewater Monitoring.

Category	Units	Method	Monitoring Freq.	Reporting Freq.
pH	mg/L	Composite	Semiannually	Semiannually
Total Dissolved Solids	mg/L	Composite	Semiannually	Semiannually
Specific Conductance	mg/L	Composite	Semiannually	Semiannually
Arsenic	µg/kg	Grab Sample	Semiannually	Semiannually
Barium	µg/kg	Grab Sample	Semiannually	Semiannually
Cadmium	µg/kg	Grab Sample	Semiannually	Semiannually
Lead	µg/kg	Grab Sample	Semiannually	Semiannually
Zinc	µg/kg	Grab Sample	Semiannually	Semiannually

Category	Units	Method	Monitoring Freq.	Reporting Freq.
General Chemistry (Ca, Mg, Na, K, SO4, Cl, HCO3)	mg/L	Composite	Annually	Annually
“CAM-17 Metals” (Title 22, § 66261.24)	mg/L	Grab Sample	Annually	Annually

d. **Leachate Collection & Removal Systems (LCRS) Monitoring.** The Discharger shall operate and maintain leachate collection and removal system (LCRS) sumps, and conduct monitoring of any detected leachate seeps in accordance with Title 27 and the following provisions.

e. **Annual Testing.** Each LCRS shall be tested annually to demonstrate proper operation, with the results of each test being compared to the results of prior testing. (Title 27, § 20340, subd. (d).) Results shall be reported annually per I.2.i.

f. **Monthly LCRS Sump Inspections.** LCRS sumps shall be inspected monthly for the presence of leachate. Any leachate present in a sump shall be sampled and analyzed for the Monitoring Parameters listed in Table 1, as well as the “CAM-17 Metals” listed in Title 22, section 66261.24. Additionally, as provided in Table 7, the total flow and flow rate for leachate in each sump shall be recorded after each inspection and reported semiannually per Section I.1.

Table 7. LCRS Sump Monitoring, Monthly Inspection Parameters.

Physical Parameter	GeoTracker Code	Units	Sampling Freq.	Reporting Freq.
Total Flow	(none)	Gallons	Monthly	Semiannually
Flow Rate	FLOW	Gallons/Day	Monthly	Semiannually

g. **Leachate Seepage.** Immediately upon detecting leachate seepage to the surface, the Discharger shall sample the leachate and analyze it for the Monitoring Parameters listed in Table 1, as well as the “CAM-17 Metals” listed in Title 22, section 66261.24. Results shall be reported semiannually per Section I.1.

h. **Monthly Visual Inspection.** The Discharger shall perform monthly visual inspections as specified in Table 8 . Results shall be included in Semiannual Monitoring Reports per Section I.1.

Table 8. Criteria for Visual Inspections.

Category	Criteria
Unit	(1) Evidence of leachate seep. (2) Estimated size of affected area (record on map) and flow rate. (3) Observations of erosion, settlement, and/or subsidence along visible areas (e.g., top of berm, outer slopes and upper region of inner slope).
Adjacent Surface Waters[14]	(1) Floating and suspended materials of waste origin—presence or absence, source and size of affected areas. (2) Discoloration and turbidity (description of color, source and size of affected areas).

i. **Annual Facility Inspections.** Prior to September 30th, the Discharger shall inspect the Facility to assess repair and maintenance needs for drainage control systems, cover systems and groundwater monitoring wells; and preparedness for winter conditions (e.g., erosion and sedimentation control). If repairs are made as result of the annual inspection, problem areas shall be photographed before and after repairs. Any necessary construction, maintenance or repairs shall be completed by October 31st. The results of Annual Facility Inspections shall be reported annually per section I.2.

j. **Major Storm Events.** Within seven days of any storm event capable of causing damage or significant erosion (Major Storm Event), the Discharger shall inspect the Facility for damage to any precipitation, diversion and drainage facilities, and all side slopes. Necessary repairs shall be completed within 30 days of the inspection. The Discharger shall take photos of any problem areas before and after repairs. See Section I.4 for reporting requirements.

[14] The Colorado River Basin Water Board Executive Officer may waive this category of monitoring based on a determination that there are no adjacent surface waterbodies that could be potentially affected by a release from any of the Facility's Units.

5. General Monitoring Provisions

a. For each Unit, the Discharger shall establish a system by which available freeboard may be visually determined based on uniform increments.

b. Driller's logs for all monitoring wells shall be submitted to the Colorado River Basin Water Board and the Department of Water Resources. (Wat. Code, § 13751; Title 27, § 20415, subd. (b)(3).)

c. All monitoring systems shall be designed and certified by a licensed civil engineer or certified engineering geologist (Qualified Professional). (Title 27, § 20415, subd. (e)(1).)

d. Monitoring wells shall be cased and constructed in a manner that maintains bore hole integrity and prevents the bore hole from acting as a conduit for contaminant transport. (Title 27, § 20415, subd. (b)(4)(A).)

e. The Discharger shall lock all groundwater monitoring wells with a lock on the well cap or monitoring well box. All monitoring devices shall be clearly labeled with their designation including all monitoring wells, LCRS risers, and lysimeter risers and shall be easily accessible for required monitoring by authorized personnel. Each monitoring device shall be clearly visible and be protected from damage by equipment or vehicles.

f. Monitoring wells, piezometers, and other measurement, sampling, and analytical devices must be operated and maintained so that they perform to design specifications throughout the life of the monitoring program. Monitoring devices that cannot be operated and maintained to perform to design specifications shall be replaced after review and approval of a report (i.e., work plan) for the proposed replacement devices.

g. All borings are to be logged during drilling under the direct supervision of a registered geologist or registered civil engineer with expertise in stratigraphic well logging. (Title 27, § 20415(e)(2).)

h. Soils are to be described according to the Unified Soil Classification System. (Title 27, § 20415, subd. (e)(2)(A).) Rock is to be described in a manner appropriate for the purpose of the investigation. (Title 27, § 20415, subd. (e)(2)(B).)

i. The Discharger shall submit a work plan for review and approval at least 60 days prior to installation or abandonment of groundwater monitoring wells.

j. The Discharger shall provide Colorado River Basin Water Board staff a minimum of one-week notification prior to commencing any field activities related to the installation or abandonment of monitoring devices.

k. The groundwater monitoring system shall include a sufficient number of monitoring points, installed at appropriate locations, to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater that has not been affected by a release from the Unit (Title 27, § 20415, subd. (b)(1)(A).)

l. The sampling interval of each monitoring well shall be appropriately screened and fitted with an appropriate filter pack to enable collection of representative groundwater samples. (Title 27, § 20415, subd. (b)(4)(B).) Groundwater samples shall not be field-filtered prior to laboratory analysis. (40 C.F.R. § 258.53(b).) Groundwater samples needing filtering (e.g., samples to be analyzed for dissolved metals) shall be filtered by the laboratory prior to analysis.

m. Groundwater elevations shall be measured in each well immediately prior to purging, each time groundwater is sampled. The owner or operator shall determine the rate and direction of groundwater flow each time groundwater is sampled. Groundwater elevations in wells which monitor the same waste management area shall be measured within a period of time short enough to avoid temporal variations in groundwater flow which could preclude accurate determination of groundwater flow rate and direction.

n. Background for water samples or soil-pore gas samples shall be represented by the data from all samples taken from applicable background monitoring points during that reporting period (at least one sample from each background monitoring point).

o. Sample analyses shall be performed by a lab certified by the State Water Resources Control Board's Environmental Laboratory Accreditation Program (ELAP). (Wat. Code, § 13176, subd. (a).)

p. Where lab analysis is required, samples analyzed using the most recent version of the USEPA Methods specified herein. If no method is specified, the Discharger shall propose an analytical method for written concurrence by Colorado River Basin Water Board staff prior to use.

q. For any given monitored medium, the samples taken from all monitoring points and background monitoring points to satisfy the data analysis requirements for a given reporting period shall all be

taken within a span not to exceed 30 days, unless a longer time period is approved in writing, and shall be taken in a manner that ensures sample independence to the greatest extent feasible.

r. Analytical methods and the detection limits shall be appropriate for anticipated concentrations. For Monitoring Parameters producing non-numerical determinations (i.e., “trace” or “non-detect”) in 90 percent of background monitoring results for a given medium, the Discharger shall use the method with the lowest MDL (among those methods that would provide valid results in light of any matrix effects or interferences).

s. Where lab analysis is required, the reporting limit (RL) for all reported monitoring data shall be less than or equal to the practical quantitation limit (PQL).

t. All “trace” results (between MDL and PQL) shall be reported as such, and shall be accompanied both by estimated MDL and PQL values for that analytical run.

u. Lab data shall not be altered or revised by the Discharger. If the Discharger observes potential lab errors, it shall identify the issue in the monitoring report and shall describe steps that will be taken to prevent similar errors in the future.

v. MDLs and PQLs shall be derived by the laboratory for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs shall reflect the detection and quantitation capabilities of the specific analytical procedure and equipment used by the lab, rather than simply being quoted from USEPA analytical method manuals. In relatively interference-free water, laboratory-derived MDLs and PQLs are expected to closely agree with published USEPA MDLs and PQLs. MDLs and PQLs shall be reported.

w. If the laboratory suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results shall be flagged in the laboratory report accordingly, along with estimates of the detection limit and quantitation limit actually achieved. The MDL shall always be calculated such that it represents the lowest achievable concentration associated with a 99 percent reliability of a nonzero result. The PQL shall always be calculated such that it represents the lowest constituent concentration at which a numerical value can be assigned with reasonable certainty that it represents the constituent’s actual concentration in the sample. Normally, PQLs

should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure.

x. All QA/QC data shall be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation limits, the percent recovery, an explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and signature of a responsible person from the laboratory. Sample results shall be reported unadjusted for blank results or spike recoveries. In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged, but the analytical results shall not be adjusted.

y. Unknown chromatographic peaks shall be reported, flagged, and tracked for potential comparison to subsequent unknown peaks that may be observed in future sampling events. Identification of unknown chromatographic peaks that recur in subsequent sampling events may be required.

6. Statistical Analyses

a. For each Unit, the Discharger shall collect all data necessary for selecting appropriate data analysis methods for establishing background values for each Monitoring Parameter. (Title 27, § 20420, subd. (c).) The Discharger shall propose a data analysis method that includes a detailed description of criteria used for determining “measurably significant” (as defined per § 20164) evidence of a release from the Unit and determining compliance with the Concentration Limits. (§ 20415, subd. (e)(6)-(7).)

b. For statistical analysis of data, the Discharger shall use one of the methods described in section 20415, subdivision (e)(8)(A)-(E). A non-statistical data analysis method may be used if the method can achieve the goal of the particular monitoring program at least as well as the most appropriate statistical method. (§ 20415, subd. (e)(8).) The Discharger shall use a statistical or nonstatistical data analysis method compliant with subdivision (e)(7)-(10) to compare the concentration of each COC or monitoring parameter with its respective background concentration to determine whether there has been a “measurably significant” evidence of a release from the Unit. For any given monitoring point at which a given constituent has already exhibited a “measurably significant” indication of a release at that monitoring point, the Discharger may

propose to monitor the constituent, at that well, using a concentration-versus-time plot.

c. The Discharger may propose, for review and approval, an alternate statistical method in lieu of methods listed in section 20415, subdivision (e)(8)(A)-(D). (§ 20415, subd. (e)(8)(E).)

d. The statistical method shall account for data below the practical quantitation limit (PQL) with one or more statistical procedures that are protective of human health and the environment.

e. Any PQL validated per section 20415, subdivision (e)(7) that is used in the statistical method shall be the lowest concentration (or value) that can be reliably achieved within limits of precision and accuracy specified in an approved SCAP for routine laboratory operating conditions that are available to the facility. The Discharger's technical report (SCAP and/or WQPS Report) per subdivision (e)(7) shall consider the PQLs listed in of California Code of Regulations, title 22 (Title 22), Division 4.5, Chapter 14, Appendix IX, for guidance when specifying limits of precision and accuracy. (Title 27, § 20415, subd. (e)(7).)

f. For any given constituent monitored at a background or downgradient monitoring point, "trace" indications (between MDL and PQL) shall be identified and used in appropriate statistical or non-statistical tests.

g. For a statistical method that is compatible with the proportion of censored data ("trace" and "non-detect") in the dataset, the Discharger may use the lab's concentration estimates in the "trace" range (if available) for statistical analysis, in order to increase the statistical power by decreasing the number of "ties."

h. Alternate statistical procedures may be used for determining the significance of analytical results for common laboratory contaminants (i.e., methylene chloride, acetone, diethylhexyl phthalate, and di-n-octyl phthalate) if part of an approved Water Quality Protection Standard. Nevertheless, analytical results involving detection of these analytes in any background or downgradient sample shall be reported and flagged for easy reference by Board staff.

I. Reporting Requirements[15]

Table 9. Summary of Required Reports.

Section	Report	Deadline
§ I.1	Semiannual Monitoring Reports (SMRs)	August 1st (1 January to 30 June) February 1st (1 July to 31 December)
§ I.2	Annual Monitoring Reports (AMRs)	February 1st
§ I.3	Leachate Seep Reporting	Immediately upon Discovery (*staff notification*) Within 7 Days (*written report*)
§ I.4	Annual Facility Inspection Reports	November 15th
§ H.4.j § I.4	Major Storm Reporting	Immediately after Damage Discovery (*staff notification*) Within 14 Days of Completing Repairs (*written report, photos*)
§ I.5	Water Quality Protection Standard Reports	Proposed Revisions (excluding Concentration Limits)

[15] In the event that the Colorado River Basin Water Board issues a Monitoring and Reporting Program (MRP) pursuant to Water Code section 13267, subdivision (b)(1), The provisions of this section shall be superseded by the MRP.

1. Semiannual Reporting

The Discharger shall submit Semiannual Monitoring Reports on **August 1st** (Jan.1 to June 30) and **February 1s**t (July 1 to Dec. 31). These reports shall contain the following materials and information:

a. Affirmation that all sampling activities referenced in the report were conducted in accordance with the approved SCAP.

b. Maps/aerial photographs depicting locations of all observation stations, monitoring points referenced in the report.

c. In tabulated format, all monitoring data required to be reported on a semiannual basis (see § I.7.b).

d. For each groundwater monitoring point referenced:

i. The times each water level measurement was taken;

ii. The type of pump or other device used to purge and elevate pump intake level relative to screening interval;

iii. The purging methods used to stabilize water in the well bore before sampling (including pumping rate);

iv. The equipment and methods used for the monitoring of pH, temperature and EC during purging activity, and the results of such monitoring;

v. Methods for disposing of purged water; and

vi. The type of device used for sampling, if different than the one used for purging.

e. Concentrations (or other results) for all Monitoring Parameters (including Five-Year COCs, when analyzed); a comparison to operative Concentration Limits; and results of any Retest Procedures (see MRP, § H.3.f).

f. In the event of a verified exceedance of Concentration Limit(s), any actions taken in accordance with Section H.3.g for wells and/or constituents.

g. Evaluation as to effectiveness of existing leachate monitoring and control facilities, and runoff/run-on control facilities.

h. A summary of any instances where leachate on the landfill liner system exceeded a depth of 30 cm (excluding the leachate sump),

and information about the required notification and corrective action.

i. Summaries of all Visual Inspections conducted per **Section H.4.h** during the reporting period.

j. Laboratory statements of results of all analyses evaluating compliance with applicable water quality requirements under this Certification.

2. Annual Reporting[16]

On **February 1st** of each year, the Discharger shall submit an Annual Monitoring Report containing following materials and information:

a. In tabulated format, monitoring data for which annual reporting is required.

b. Graphs of all analytical data from each POC monitoring point, from each non-POC downgradient monitoring point, and from each background monitoring point. (§ 20415, subd. (e)(14).)

c. Graphs of historical trends for all Monitoring Parameters, including Five-Year COCs, with respect to each monitoring point over the past five calendar years.[17]

d. Evaluation of Monitoring Parameters with regard to the cation/anion balance, and graphical presentation of same in a Stiff diagram, Piper graph or Schoeller plot.

e. In tabulated format, historical monitoring data for which there are detectable results, including data for the previous year.

f. For each groundwater well, quarterly hydrographs showing the elevation of groundwater with respect to the top and bottom of the screened interval, and the elevation of the pump intake.

[16] The Annual Monitoring Report may be combined with the Semiannual Monitoring Report for July 1st through December 31st of the same year, provided that the combination is clearly indicated in the title.

[17] Each graph shall contain individual data points (not mean values) and be appropriately scaled to accurately depict statistically significant trends or variations in water quality.

g. Comprehensive discussion of the Facility's compliance record, and the result of any corrective actions taken or planned which may be needed to attain full compliance with these requirements.

h. Summary of monitoring results, indicating changes made or observed since the previous Annual Monitoring Report.

i. Discussion of Annual LCRS Testing results (§ H.4.e).

j. Annual updates to Concentration Limits for all Monitoring Parameters and Monitoring Points.

k. Results of the Annual Facility Inspection per Section H.4.i, as well as a discussion of any repair measures implemented, any preparations for winter, and include photographs of any problem areas and repairs.

l. Updates to the financial assurances cost estimates for closure and corrective action.

m. Every five years, the Discharger shall perform stability analyses that include components to demonstrate the integrity of the Unit's foundation, final slopes, and containment systems under both static and dynamic conditions throughout the life of the Unit. (Title 27, § 21750, subd. (f)(5).)

3. Leachate Seep Reporting.

Upon discovery of seepage within the Facility, the Discharger shall immediately notify the Colorado River Basin Water Board via telephone or email; and within seven days, submit a written report with the following information:

a. Map(s) depicting the location(s) of seepage;

b. Estimated flow rate(s);

c. A description of the nature of the discharge (e.g., all pertinent observations and analyses);

d. Verification that samples have been submitted for analyses of the applicable Monitoring Parameters, and an estimated date that the results will be submitted to the Colorado River Basin Water Board; and

e. Corrective measures underway or proposed, and corresponding time schedule.

4. Major Storm Reporting.

The Discharger shall notify Board staff, via phone or email, immediately upon discovering damage to the Facility resulting from a Major Storm Event (see H.4.j for definition). Within 14 days of completing any necessary repairs per Section H.4.j, the Discharger shall submit a report discussing the repairs; before and after photos shall be included.

5. Water Quality Protection Standard Report.

Any proposed changes[18] to the Water Quality Protection Standard (WQPS) components, other than periodic update of the Concentration Limits, shall be submitted for Executive Officer review and approval. The report shall be certified by a Qualified Professional, and contain the following:

a. An identification of all distinct bodies of surface water and groundwater potentially affected by a release (including, but not limited to, the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the Facility);

b. A map of all groundwater, surface water[19] and unsaturated zone monitoring points (including all background/upgradient and POCs);

c. An evaluation of perennial direction(s) of groundwater movement within the uppermost zone(s);

d. A proposed statistical method for calculating Concentration Limits for Monitoring Parameters (including Five-Year COCs) detected in at least 10 percent of the background data using a statistical procedure from subdivisions (e)(8)(A)-(D) or (e)(8)(E) of section 20415; and

e. A retesting procedure to confirm or deny measurably significant evidence of a release (§§ 20415(e)(8)(E), 20420(j)(1)-(3)).

[18] If subsequent sampling of the background monitoring point(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to onsite activities, the Discharger may request modification of the WQPS.

[19] To the extent surface water monitoring is included in Detection Monitoring.

6. Other Required Notifications

The Discharger shall immediately notify Colorado River Basin Water Board staff of either:

a. Any failure which threatens the integrity of containment features or the Unit shall be promptly corrected in accordance with an approved method. (Title 27, § 21710, subd. (c)(2).)

b. Any flooding, unpermitted discharge of waste off-site or outside of Units, equipment failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.

7. General Reporting Provisions

a. **Transmittal Letters.** Each report submitted to the Colorado River Basin Water Board shall be accompanied by a Transmittal Letter providing a brief overview of the enclosed report, as well as the following:

i. Any violations found since the last report was submitted, a description of all actions undertaken to correct the violation (referencing any previously submitted time schedules for compliance), and whether the violations were corrected; and

ii. A statement from the submitting party, or its authorized agent, signed under penalty of perjury, certifying that, to the best of the signer's knowledge, the contents of the enclosed report are true, accurate and complete.

b. **Electronic Submittal via GeoTracker.** Reports shall be submitted electronically via the State Water Board's GeoTracker Database (https://geotracker.waterboards.ca.gov). After uploading, the Discharger shall notify Colorado River Basin Water Board staff via email to RB7_WDRs_paperless@waterboards.ca.gov, or another address specified by staff. The following information shall be included in the body of the email:

Attention:	Land Disposal Unit
Report Title:	[Report Title]
Upload ID:	[Number]
Facility:	[Facility]
County:	[County]
GeoTracker ID:	[Number]

c. **Preparation of Technical Reports by Qualified Professionals.** All technical reports submitted under this Order shall be prepared by, or under the direct supervision of, a licensed civil engineer or engineering geologist (Qualified Professional). For the purposes of this section, a "technical report" is a report incorporating the application of scientific or engineering principles.

d. **Certifications for Submittals.** All submittals under this Order shall be accompanied by a transmittal containing the following certification that is signed by either the Required Signatory (specified in the table below) or their Authorized Representative:

> I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

e. To act as an **Authorized Representative** for a Required Signatory, an individual must be identified[20] and duly authorized in writing by the Required Signatory; this written authorization shall be provided to the Board beforehand, or concurrently with the first submittal signed by the Authorized Representative.

MRP Table 10. Required Signatories for Submittals.

Category	Required Signatory
Corporation	Senior Vice President or Equivalent Principal Executive
Limited Liability Companies (LLCs)	Manager
General Partnerships and Limited Partnerships (LPs)	General Partner
Sole Proprietorship	Sole Proprietor

[20] This identification may be in reference to the Authorized Representative's title or position, provided it is one that customarily has the responsibility of supervising a facility's overall operation (e.g., facility manager, superintendent).

Category	Required Signatory
Municipalities and Other Public Agencies	Principal Executive or Ranking Elected/Appointed Official

f. **Data Presentation and Formatting.** In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. Additionally, data shall be summarized in a manner that clearly illustrates compliance/noncompliance with Colorado River Basin Water Board permit conditions.

g. **Non-Detections / Reporting Limits.** Unless the reporting limits (RL) are specified in the same table, non-detections and sub-RL concentrations shall be reported as "< [limit]" (e.g., "< 5 µg/L").

h. **Units.** Absent specific justification, all monitoring data shall be reported in the units specified herein.

i. **Additional Requirements.** Every monitoring report submitted under these permit provisions shall include a discussion of relevant field and laboratory tests, and the results of all monitoring conducted at the site shall be reported to the Board in accordance with the reporting schedule above for the calendar period in which samples were taken or observations made.

J. Record Retention Requirements[21]

The Discharger shall maintain permanent records of all monitoring information, including without limitation: calibration and maintenance records; original strip chart recordings of continuous monitoring instrumentation; copies of all reports required herein; and records of all data used to complete applications for WDRs or other environmental permits. Such records shall be legible, and show the following for each sample:

1. Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;

2. Date, time and manner of sampling;

[21] In the event that the Colorado River Basin Water Board issues a Monitoring and Reporting Program (MRP) pursuant to Water Code section 13267, subdivision (b)(1), The provisions of this section shall be superseded by MRP.

3. Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;

4. A complete list of procedures used (including method of preserving the sample, and the identity and volumes of reagents used);

5. A calculation of results; and

6. The results of all analyses, as well as the MDL and PQL for each analysis (all peaks shall be reported).

K. Stormwater Requirements

1. The Discharger shall maintain a Storm Water Pollution Prevention Plan (SWPPP) and Monitoring Program and Reporting Requirements in accordance with the operative Industrial General Permit issued by the State Water Board in accordance with the Clean Water Act.

2. The Facility's storm water conveyance systems shall be designed to fully handle a 1,000-year, 24-hour storm event. (Title 27, § 21750, subd. (e)(3).)

3. Surface and subsurface drainage be diverted away from the Unit. (Title 27, § 20365, subd. (e).)

4. Diversion and drainage facilities shall be designed, constructed, and maintained to:

    a. Accommodate the anticipated volume of precipitation and peak flows from surface runoff and under the precipitation conditions for the Unit.

    b. Effectively divert sheet flow runoff laterally, via the shortest distance, into the drainage and collection facilities.

    c. Prevent surface erosion through the use of energy dissipators where required to decrease the velocity of runoff, slope protection, and other erosion control measures where needed to prevent erosion.

    d. Control and intercept run-on, in order to isolate uncontaminated surface waters from water that might have come into contact with waste.

    e. The design capacity of drainage systems of downstream and adjacent properties by providing for the gradual release of retained water downstream in a manner which does not exceed the

expected peak flow rate at the point of discharge if there were no waste management facility.

f. The Discharger shall periodically remove accumulated sediment from the sedimentation or detention basins as needed to preserve the design capacity of the system. (Title 27, § 20365, subd. (c).)

5. Collection and holding facilities associated with precipitation and drainage control systems shall be emptied immediately following each storm or otherwise managed to maintain the design capacity of the system. (Title 27, § 20365, subd. (d).)

GLOSSARY OF TERMS

CalGEM .....California Department of Conservation, Geologic Energy Management Division

CAP.....Corrective Action Program

CAMP.....Corrective Action Monitoring Program

COCs .....Constituents of Concern

CQA .....Construction Quality Assurance

Designated Waste .....(a) Hazardous Waste subject to variance from management requirements per Health and Safety Code section 25143; and (b) Nonhazardous Waste containing pollutants that, under ambient conditions, could be released in concentrations exceeding applicable WQOs, or that could reasonably be expected to affect beneficial uses of water. (Wat. Code, § 13173.)

DMP .....Detection Monitoring Program

DTSC .....California Department of Toxic Substances Control

DWR.....California Department of Water Resources

EC .....Electrical Conductivity

EMP .....Evaluation Monitoring Plan

FEMA .....Federal Emergency Management Agency

GCL.....Geocomposite Liner

Hazardous Waste .....Wastes which, pursuant to Title 22, section 66261.3 et seq., are required to be managed in accordance with Division 4.5 of Title 22. (Title 27, § 20164; Title 23, § 2521(a).)

HDPE .....High-Density Polyethylene

LCRS .....Leachate Collection and Removal System

Leachate.....Liquid formed by the drainage of liquids from waste or by the percolation or flow of liquid through waste.

Leachate includes any constituents extracted from the waste and dissolved or suspended in the fluid. (Title 27, § 20164.)

MCE .....Maximum Credible Earthquake

MDL .....Method Detection Limit

MPE .....Maximum Probable Earthquake

MRP .....Monitoring and Reporting Program

MW.....Monitoring Well

NOA .....Notice of Applicability

PQL.....Practical Quantitation Limit

Qualified Professional .....California registered civil engineer or certified engineering geologist

RCRA.....Resource Conservation and Recovery Act

ROWD.....Report of Waste Discharge

TDS.....Total Dissolved Solids

Title 22.....California Code of Regulations, Title 22

Title 23.....California Code of Regulations, Title 23

Title 27.....California Code of Regulations, Title 27

Trace Results.....Results between Method Detection Limit (MDL) and Practical Quantitation Limit (PQL)

Unit .....Waste Management Unit

USEPA.....United States Environmental Protection Agency

VOCs .....Volatile Organic Compounds

WDRs.....Waste Discharge Requirements

WMU / Unit .....Waste Management Unit

WQOs .....Water Quality Objectives

WQPS .....Water Quality Protection Standard

Appendix E

Mailing List

Appendix E: Mailing List

The following is the mailing list for the Morton Bay Geothermal Project.

The following is a list of the State agencies that received a request for participation notice:

- Anza Borrego Desert State Park Stout Research Center
- California Department of Transportation, District 11 (DOT)
- California Natural Resources Agency
- California Public Utilities Commission (CPUC)
- California Regional Water Quality Control Board, (RWQCB)
- California Dept. of Conservation, Geologic Energy Mgmt. Division (CalGEM)
- Colorado River Basin RWQCB, Region 7
- California Public Utilities Commission
- Department of Toxic Substances Control
- State Water Resources Control Board, Division of Water Quality
- California Native American Heritage Commission (NAHC)
- California Department of Fish and Wildlife (CDFW)
- Air Resources Board
- California Department of Conservation
- CalRecycle
- Department of Parks and Recreation
- State Lands Commission

Table E-1 presents the list of occupants and property owners within 1,000 feet of the power plant site and within 500 feet of project linear facilities.

Table E-2 presents the list of agencies, including responsible and trustee agencies and libraries.

TABLE E-1 OWNERS AND OCCUPANTS PROPERTY LIST				
Name	**Address**	**City**	**State**	**Zip**
IID (IID-TRUST LANDS)	333 E BARIONI BLVD	IMPERIAL	CA	92251
OCCUPANT	P O BOX 85	VALYERMO	CA	93563
PHILIP H & CRISTINA TRUSTEES ARKLIN	P O BOX 85	VALYERMO	CA	93563
OCCUPANT	3292 MARICOPA HWY	OJAI	CA	93023
OCCUPANT	P.O. BOX 1421	MONTEBELLO	CA	90640
OCCUPANT	31650 MELVIN ST	MENIFEE	CA	92584
OASIS SANCTUARY LLC	P O BOX 900697	PALMDALE	CA	93590
OCCUPANT	8356 PONCE AVE	WEST HILLS	CA	91304
MAGMA POWER COMPANY	P O BOX 657	DES MOINES	IA	50306
RIVER RANCH INC (RIVER RANCHES INC)	PO BOX 285	HOUSTON	TX	77001
OCCUPANT	696 N 8TH ST	BRAWLEY	CA	92227
OCCUPANT	696 N 8TH ST	BRAWLEY	CA	92227
OCCUPANT	786 W SINCLAIR RD	CALIPATRIA	CA	92233
RAYHAWK DOROTHY A TRUSTEE	P. O. BOX 1031	HAPPY CAMP	CA	96039
BLUE SKY RANCH PROPERTIES LLC	681 MARILYN AVE	BRAWLEY	CA	92227-3012
IMPERIAL MAGMA LLC	P O BOX 657	DES MOINES	IA	50306
OCCUPANT	6920 LACK RD	CALIPATRIA	CA	92233
HARTHILL ACRES	696 N 8TH ST	BRAWLEY	CA	92227
MAGMA LAND COMPANY	P O BOX 657	DES MOINES	IA	50306
OCCUPANT	6922 CRUMMER RD	CALIPATRIA	CA	92233
OCCUPANT	29400 CRAWFORD CANYON RD	MURRIETA	CA	92563
ELMORE ELMORE & RICHARD CO-TRS	696 N 8TH ST	BRAWLEY	CA	92227
KUDU INC	696 N 8TH ST	BRAWLEY	CA	92227
OCCUPANT	6858 CRUMMER	CALIPATRIA	CA	92233
OCCUPANT	824 CORRIENTE POINT DR	REDWOOD CITY	CA	94065
UC35:E75NION OIL COMPANY OF CALIFORNIA	PO BOX 285	HOUSTON	TX	77001
OCCUPANT	950 W LINDSEY RD	CALIPATRIA	CA	92233
ELMORE ANN KELLEY RANCHES LTD PARTNERSHIP	696 N 8TH ST	BRAWLEY	CA	92227
OCCUPANT	696 N 8TH ST	BRAWLEY	CA	92227

TABLE E-1 OWNERS AND OCCUPANTS PROPERTY LIST				
Name	**Address**	**City**	**State**	**Zip**
OCCUPANT	7030 GENTRY RD	CALIPATRIA	CA	92233
VULCAN/BN GEOTHERMAL POWER COMPANY	PO BOX 657	DES MOINES	IA	50306
OCCUPANT	7001 GENTRY RD	CALIPATRIA	CA	92233
HARTHILL ACRES	700 ROGUE WOOD DR	WHITE CITY	OR	97503
OCCUPANT	4685 ALDRICH DR	PRESCOTT	AZ	86305
OCCUPANT	18701 E CATTLE DR	QUEEN CREEK	AZ	85142
OCCUPANT	824 CORRIENTE POINT DR	REDWOOD CITY	CA	94065
OCCUPANT	696 N 8TH ST	BRAWLEY	CA	92227
OCCUPANT	3949 AUSTIN RD	BRAWLEY	CA	92227
OCCUPANT	3949 AUSTIN RD	BRAWLEY	CA	92227
OCCUPANT	409 W MC DONALD RD	CALIPATRIA	CA	92233
ALPHABET FARMS LLC	5701 TRUXTUN AVE	BAKERSFIELD	CA	93309
SYNTHETIC GENOMICS INC.	11149 N TORREY PINES RD	LA JOLLA	CA	92037
RIVER RANCH INC (RIVER RANCHES INC)	P O BOX 267	CALIPATRIA	CA	92233
OCCUPANT	PO BOX 772	CALIPATRIA	CA	92233
OCCUPANT	342 W SINCLAIR RD	CALIPATRIA	CA	92233
IID(IID-TRUST LANDS)	P O BOX 937	IMPERIAL	CA	92251
RAVIANO PROPERTIES LLC	1008 S NOVARRO SSTREET	WEST COVINA	CA	91791
OCCUPANT	15510 OLIVE BRANCH DR	LA MIRADA	CA	90638
GENUS LP	PO BOX 1178	TEMECULA	CA	92593
WIEST JOHN WILLIAM TRUSTEE	8 RED TAIL TRACE	CARMEL	CA	93923
JOY L WIEST SOLAR LLC	2434 NIDO AGUILA	ALPINE	CA	91901
DECOTA ENTERPRISES	PO BOX 1748	EL CENTRO	CA	92244
REAL ESTATE AND ENVIRONMENTAL COMPLIANCE	333 E BARIONI BLVD	IMPERIAL	CA	92251-1773
OCCUPANT	4327 PARK PALOMA	CALABASAS	CA	91302-1791
VULCAN/BN GEOTHERMAL POWER COMPANY	7030 GENTRY RD	CALIPATRIA	CA	92233-9720
RUSSELL BROS RANCHES INC	4296 FORRESTER RD	BRAWLEY	CA	92227-9774
ALPHABET FARMS LLC	113 S LA BREA AVE	LOS ANGELES	CA	90036-2998

TABLE E-2 AGENCIES AND LIBRARIES							
First Name	**Last Name**	**Title**	**Agency**	**Address**	**City**	**State**	**Zip**
JESUS	RAMIREZ	APC DIVISION MANAGER	IMPERIAL COUNTY AIR POLLUTION CONTROL DISTRICT (ICAPCD)	150 S. 9TH STREET	EL CENTRO	CA	92243
JONATHAN	SHORE	PROJECT LEADER	SONNY BONO SALTON SEA NATIONAL WILDLIFE REFUGE, USFWS REGION 8	906 WEST SINCLAIR ROAD	CALIPATRIA	CA	92233-9744
ELAINE	SISON-LEBRILLA	MANAGER-CEQA AND FERC BRANCH	CALIFORNIA PUBLIC UTILITIES COMMISSION	505 VAN NESS AVENUE	SAN FRANCISCO	CA	94102
			USACE, IMPERIAL COUNTIES SECTION, REGION 9	5900 LA PLACE CT. STE. 100	CARLSBAD	CA	92008
WHITE	ROLLIE	ASSISTANT FIELD SUPERVISOR	US FISH AND WILDLIFE OFFICE, INLAND DESERTS REGION, PALM SPRINGS OFFICE	777 E. TAHQUITZ CANYON WAY, STE 208	PALM SPRINGS	CA	92262
			STATE OF CALIF DEPT OF FISH & GAME	PO BOX 944209	SACRAMENTO	CA	94244
JOHNATHON	SHORE	ACTING PROJECT LEADER, SONNY BONO SALTON SEA NATIONAL WILDLIFE REFUGE	US FISH AND WILDLIFE SERVICE, COACHELLA VALLEY NATIONAL WILDLIFE REFUGE	906 W. SINCLAIR ROAD	CALIPATRIA	CA	92233
		DIV. OF LAND RESOURCE PROTECTION	CALIFORNIA DEPARTMENT OF CONSERVATION	715 P STREET	SACRAMENTO	CA	95814
LAURA	MIRANDA	COMMISSIONER	NATIVE AMERICAN HERITAGE COMMISSION	1550 HARBOR BLVD, SUITE 100	WEST SACRAMENTO	CA	95691
MAURICE	EATON		IGR, CALTRANS, DISTRICT 11	4050 TAYLOR STREET	SAN DIEGO	CA	92110
CASSANDRA	OWENS	ASSISTANT EXECUTIVE OFFICER	COLORADO RIVER BASIN RWQCB, REGION 7	73720 FRED WARING DRIVE, STE. 100	PALM DESERT	CA	92260

TABLE E-2 AGENCIES AND LIBRARIES							
First Name	**Last Name**	**Title**	**Agency**	**Address**	**City**	**State**	**Zip**
JULIE	PETTIJOHN	BRANCH CHIEF BERKELEY/HQ	DEPT. OF TOXIC SUBSTANCES CONTROL	700 HEINZ AVENUE SUITE 200	BERKELEY	CA	94710
ROBERT	KRUG	DTSC CUPA	IMPERIAL COUNTY DTSC CUPA	627 WAKE AVENUE	EL CENTRO	CA	92243
			CALRECYCLE	P.O. BOX 4025	SACRAMENTO	CA	95812-4025
JEFF	LAMOURE	REHS, DEPUTY DIRECTOR OF ENV. HEALTH	IMPERIAL COUNTY PUBLIC HEALTH DEPARTMENT	MAIN OFFICE, 797 MAIN ST. STE. B	EL CENTRO	CA	92243
BINAYA	SHRESTHA	SUBJECT MATTER EXPERT, PG&E	CALIFORNIA INDEPENDENT SYSTEM OPERATOR	250 OUTCROPPING WAY	FOLSOM	CA	95630
WADE	CROWFOOT	SECRETARY	CALIFORNIA NATURAL RESOURCES AGENCY	1416 NINTH STREET, SUITE 1311	SACRAMENTO	CA	95814
JERRY	SALERA	SENIOR OIL AND GAS ENGINEER	CALIFORNIA DEPT. OF CONSERVATION, GEOLOGIC ENERGY MGMT. DIVISION	715 P STREET, 18TH FLOOR	SACRAMENTO	CA	95814-6408
		CALGEM SOUTHERN DISTRICT	GEOLOGIC ENERGY MGMT. DIVISION (CALGEM)	3780 KILROY AIRPORT WAY, STE. 400	LONG BEACH	CA	90806
PHILLIP	CRADER	ASST. DEPUTY DIRECTOR	STATE WATER RESOURCES CONTROL BOARD, WATER QUALITY DIVISION	P.O. BOX 100	SACRAMENTO	CA	95812-0100
JAMES	BOOTH	DISTRICT CONSERVATIONIST	NATURAL RESOURCES CONSERVATION SERVICES	2337 TECHNOLOGY PKWY., SUITE C	HOLLISTER	CA	95023-2544
KARLA	NEMETH	DIRECTOR	DEPARTMENT OF WATER RESOURCES	P.O. BOX 942836	SACRAMENTO	CA	94236-0001
CHUCK	STOREY	CLERK RECORDER	COUNTY OF IMPERIAL, OFFICE OF THE CLERK RECORDER	940 W. MAIN STREET, STE 202	EL CENTRO	CA	92243

TABLE E-2 AGENCIES AND LIBRARIES							
First Name	**Last Name**	**Title**	**Agency**	**Address**	**City**	**State**	**Zip**
REBECCA	FANCHER	STAFF AIR POLLUTION SPECIALIST	CALIFORNIA AIR RESOURCES BOARD	1001 I ST	SACRAMENTO	CA	95814
COURTNEY	GRAHAM	MANAGER	CALIFORNIA AIR RESOURCES BOARD, ENFORCEMENT DIVISION	1001 I ST	SACRAMENTO	CA	95814
			CALIPATRIA FIRE DEPARTMENT	125 NORTH PARK AVENUE	CALIPATRIA	CA	92233
		PLANNING DEPARTMENT	CITY OF CALIPATRIA	125 NORTH PARK AVENUE	CALIPATRIA	CA	92233
		PLANNING, BUILDING, & ENGINEERING	CITY OF WESTMORLAND	355 SOUTH CENTER STREET	WESTMORLAND	CA	92281
			THE SALTON SEA AUTHORITY	82995 HWY. 111, STE 200	INDIO	CA	92201
JIM	MINNICK	PLANNING AND DEVELOPMENT SERVICES DIRECTOR	IMPERIAL COUNTY PLANNING AND DEVELOPMENT SERVICES	801 MAIN STREET	EL CENTRO	CA	92243
SERGIO	RUBIO	BUILDING DIVISION MANAGER	IMPERIAL COUNTY PLANNING AND DEVELOPMENT SERVICES	801 MAIN STREET	EL CENTRO	CA	92243
JOHN	GAY	PUBLIC WORKS DEPARTMENT CHAIR	IMPERIAL COUNTY PUBLIC WORKS	155 SOUTH 11TH STREET	EL CENTRO	CA	92243
MIKE	GOODSELL	CHAIRMAN OF THE AIRPORT LAND USE COMMISSION	AIRPORT LAND USE COMMISSION, IMPERIAL COUNTY PLANNING AND DEVELOPMENT SERVICES	801 MAIN STREET	EL CENTRO	CA	92243
ANTONIO	ORTEGA	GOVERNMENTAL AFFAIRS SPECIALIST	IMPERIAL IRRIGATION DISTRICT (IID)	333 E. BARIONI BLVD	IMPERIAL	CA	92251
TINA	SHIELDS	WATER DEPARTMENT MANAGER	IMPERIAL IRRIGATION DISTRICT (IID)	333 E. BARIONI BLVD	IMPERIAL	CA	92251

TABLE E-2 AGENCIES AND LIBRARIES							
First Name	**Last Name**	**Title**	**Agency**	**Address**	**City**	**State**	**Zip**
JAMIE	ASBURY	ENERGY DEPARTMENT MANAGER	IMPERIAL IRRIGATION DISTRICT (IID)	333 E. BARIONI BLVD	IMPERIAL	CA	92251
JULIANNE	POLANCO	STATE HISTORIC PRESERVATION OFFICER	OFFICE OF HISTORIC PRESERVATION	1725 23RD STREET, SUITE 100	SACRAMENTO	CA	95816
DR. LYNDON	MURRAY	DISTRICT PALEONTOLOGIST	ANZA BORREGO DESERT STATE PARK STOUT RESEARCH CENTER	200 PALM CANYON DRIVE	BORREGO SPRINGS	CA	92004
		CEC - ENERGY LIBRARY		715 P STREET, MS-10	SACRAMENTO	CA	95814-5504
GOV PUBLICATIONS		FRESNO COUNTY FREE LIBRARY		2420 MARIPOSA ST	FRESNO	CA	93721-2204
		HUMBOLDT COUNTY MAIN LIBRARY		1313 3RD STREET	EUREKA	CA	95501-0553
SERIALS DIVISION		LOS ANGELES PUBLIC LIBRARY		630 W 5TH ST	LOS ANGELES	CA	90071-2002
SCIENCE & INDUSTRY DIV		SAN DIEGO PUBLIC LIBRARY		330 PARK BLVD	SAN DIEGO	CA	92101-6478
GOVERNMENT INFORMATION CENTER		SAN FRANCISCO PUBLIC LIBRARY		100 LARKIN ST	SAN FRANCISCO	CA	94102-4733
GOV PUBS		STANLEY MOSK LIBRARY & COURTS BLDG		914 CAPITOL MALL, 3RD FLOOR	SACRAMENTO	CA	95814
JANE GUERRERO, COUNTY LIBRARIAN		IMPERIAL COUNTY LIBRARY		1125 MAIN STREET	EL CENTRO	CA	92243