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TABLE OF CONTENTS

Begin Bates	End Bates	Unified Title	Primary Date/Time
SMSP01136	SMSP01162	TN264913_20250718T164954_Updated Project Description and Responses to REV 1 DR BIO-2 and REV 1 DR ES (1).pdf	7/18/2025 16:59
SMSP01163	SMSP01167	Re: Soda Mountain Solar Project - Notice of Information and Environmental Scoping Meeting -- August 29 2025 at 1 PM	8/27/2025 14:50
SMSP01168	SMSP01172	RE: Soda Mountain Solar Project - Notice of Information and Environmental Scoping Meeting -- August 29 2025 at 1 PM	8/27/2025 15:01
SMSP01173	SMSP01173	CEC Soda Mountain Solar Project	8/27/2025 11:16
SMSP01174	SMSP01174	Soda Mountain Solar - BLM Receipt of August 2025 Plan of Development and Appendices	8/12/2025 17:13
SMSP01175	SMSP01175	BLM & CEC - DOI process Solar projects	8/28/2025 12:55
SMSP01176	SMSP01180	Re: Site Visit Request for Soda Mountain Solar Project (8/29)	8/25/2025 9:59
SMSP01181	SMSP01186	Re: Site Visit Request for Soda Mountain Solar Project (8/29)	8/25/2025 11:46
SMSP01187	SMSP01188	Fw: Soda Mt Meeting 3/20/2024	7/24/2025 14:17
SMSP01189	SMSP01192	2024-03-19_SodaMtn_Data Request_1c.pdf	3/19/2024 16:39
SMSP01193	SMSP01194	Site Visit Request for Soda Mountain Solar Project (8/28 or 8/29)	7/29/2025 18:02
SMSP01195	SMSP01195	Soda Mountain - school impact fees	8/13/2025 17:19
SMSP01196	SMSP01197	Re: Soda Mountain - school impact fees	8/14/2025 6:57
SMSP01198	SMSP01199	Re: Soda Mountain - school impact fees	8/15/2025 9:07
SMSP01200	SMSP01206	Re: Site Visit Request for Soda Mountain Solar Project (8/29)	8/26/2025 9:13

SMSP01207	SMSP01213	Re: Site Visit Request for Soda Mountain Solar Project (8/29)	8/28/2025 9:09
SMSP01214	SMSP01215	Re: BLM & CEC - Soda Mtn Solar Project Amendment	8/28/2025 12:09
SMSP01216	SMSP01218	IM Department Review of Solar and Wind.pdf	7/15/2025 7:58
SMSP01219	SMSP01219	BLM & CEC - DOI process Solar projects	8/28/2025 12:55
SMSP01220	SMSP01222	Re: Soda Mountain- text in Appendix C- Air Quality GHG Report- July 2025 Review blacked out	7/22/2025 11:02
SMSP01223	SMSP01227	Re: Soda Mt. Water-1 Information	7/29/2025 16:50
SMSP01228	SMSP01228	Hybrid Informational/Scoping Meeting Arrangements - Soda Mountain Solar Project	7/23/2025 17:32
SMSP01229	SMSP01230	Re: Soda Mt. Water-1 Information	7/28/2025 8:52
SMSP01231	SMSP01232	Re: Public interest for Soda Mountain Solar Project	8/15/2025 10:58
SMSP01233	SMSP01235	Re: Public interest for Soda Mountain Solar Project	8/15/2025 12:14
SMSP01236	SMSP01236	Soda Mountain- published public notice for information and environmental scoping meeting	8/20/2025 11:24
SMSP01237	SMSP01238	Soda Mountain- Requested updates to project description figures for project description consistency and related questions	8/26/2025 15:25
SMSP01239	SMSP01240	Re: Hybrid Informational/Scoping Meeting Arrangements - Soda Mountain Solar Project	7/23/2025 17:34
SMSP01241	SMSP01243	Re: [EXTERNAL] Soda Mountain Solar Project- Meeting request asap	7/24/2025 17:19
SMSP01244	SMSP01245	Soda Mt. Water-1 Information	7/28/2025 8:44
SMSP01246	SMSP01272	Burns & McDonald and Panorama 2014_Appendix H4_Sensitivity Analysis.pdf	7/10/2020 11:33
SMSP01273	SMSP01306	Panorama 2013_Appendix H1_Water Supply Assessment.pdf	7/10/2020 11:30

SMSP01307	SMSP01353	TRC Solutions 2013_Appendix H3_Hydrogeologic Conditions.pdf	7/10/2020 11:32
SMSP01354	SMSP01390	Soda Mt Water Supply Report_Final 22Jul25_Rev 25Jul25.docx	7/25/2025 11:44
SMSP01391	SMSP01393	Re: Hybrid Informational/Scoping Meeting Arrangements - Soda Mountain Solar Project	7/28/2025 14:25
SMSP01394	SMSP01394	Soda Mt. DR REV 2 PH-1 and DR REV 2 GHG-1	7/29/2025 13:38
SMSP01395	SMSP01558	App C_Soda Mt Solar Project_AQ GHG Report_7-29-25_Redacted.pdf	7/29/2025 13:39

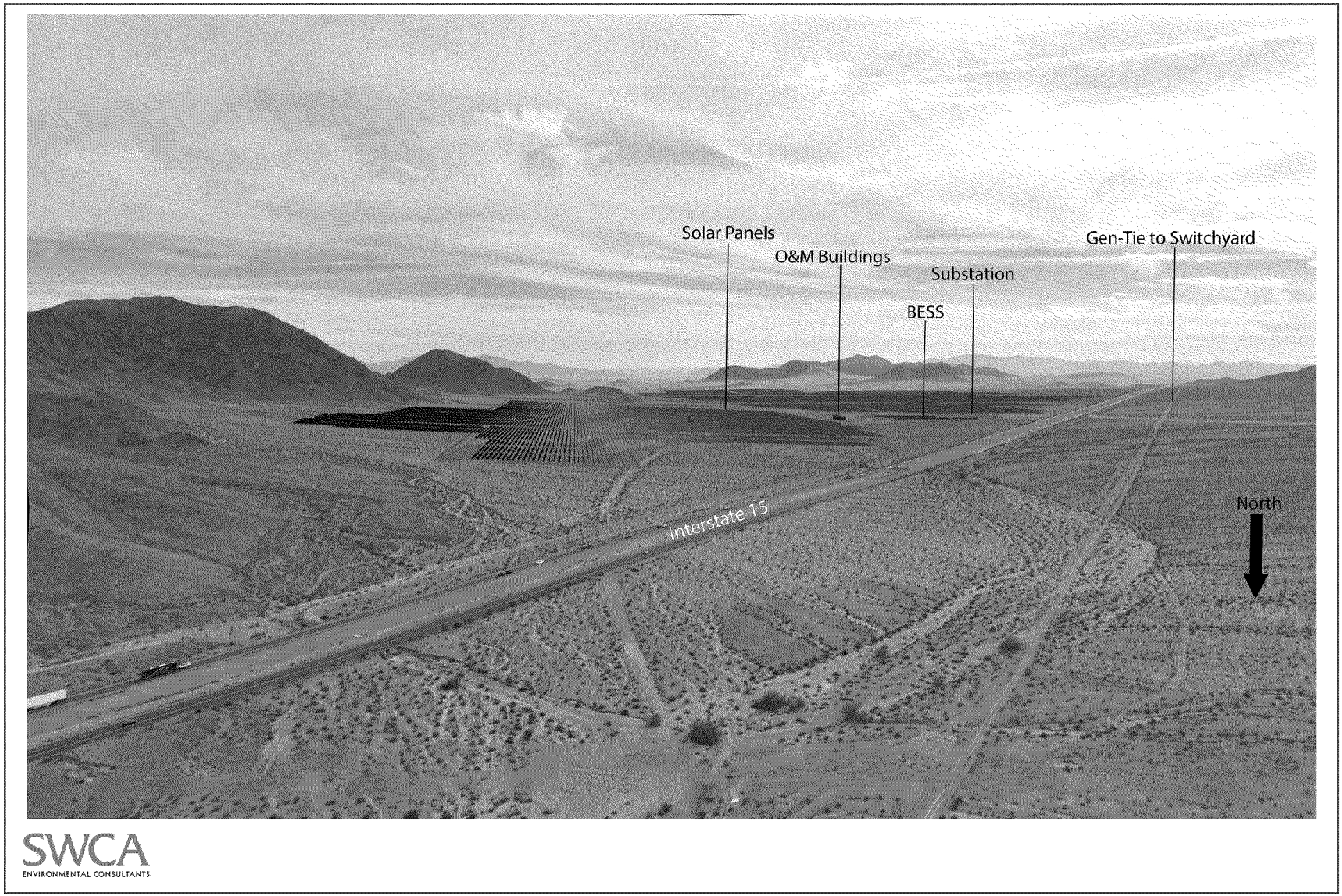


Figure 2-10. Simulated view from northwest, facing east across I-15 to project site.

2.4.1 *Solar Panel Arrays and Support Structures*

2.4.1.1 SOLAR PANEL ARRAYS

Solar cells, also called photovoltaic (PV) cells, convert sunlight directly into electricity (voltage), which is called the "PV effect." PV cells are located on panels; rows of solar panels form an array. The PV modules are uniformly dark in color, non-reflective/anti-reflective glass coating, and designed to be highly absorptive of all light that strikes their glass surfaces. Arrays are mounted onto single axis solar trackers that rotate throughout the day to increase the solar irradiance received by the solar panels. Each single axis tracker includes framing members to support the solar panels as well as bearings and a single motor with a wireless connection to a control panel responsible for moving the tracker. For the project, thousands of solar trackers would be interconnected to form a utility-scale PV system. The solar panel arrays would be organized into Area 1, Area 2, Area 3, and Area 4 on the southeast side of I-15, as shown in Figure 2-7.

2.4.1.2 SUPPORT AND MOUNTING STRUCTURES

The single-axis solar tracker would be supported by steel piles (e.g., cylindrical pipes, H-beams, helical ground screws, or similar), which would be driven into the soil using pile/vibratory/rotary driving technique. Driven pier foundations are a "concrete-free" foundation solution that would result in minimal site disturbance and facilitate site reclamation during decommissioning. Most pier foundations would be driven to approximate depths of 6 to 12 feet deep depending upon the required embedment depth. The piles would be spaced 10 to 15 feet apart. The array panels would be elevated at least 1 foot above the design flood elevation and approximately 6 to 12 feet tall, depending on site topography.

2.4.1.3 ELECTRICAL CONNECTION SYSTEM

The solar facility would be designed to be available to operate at its maximum possible output (based on meteorological conditions) at least 99 percent of the time. Availability is the duration of time that the entire plant will be able to perform its intended task. It is calculated as a ratio expressed in percentage where the numerator is the number of hours when the system as a whole is either (1) ready to charge the BESS (during idle/standby periods); (2) is charging the BESS; or (3) actively exporting electrons directly to the point of interconnection (rather than first to the BESS), all divided by the total number of hours in the period. Typically, both planned and unplanned outages are subtracted from the availability calculation numerator to calculate actual availability for a period. The availability calculation denominator can be the total amount of time in the day, week, month or, most commonly, year where availability is being calculated. For further clarity, availability is not the same as a typical generating plant's capacity factor, which accounts for annual criteria such as the plant's actual energy MWh output (numerator) versus the plant's nameplate capability to produce MWh over a full year (denominator), and which is usually based on the general assumption that the relevant plant will always operate at baseload. The solar facility is expected to have an annual and lifetime capacity factor of 20 to 40 percent.

The proposed solar-generating equipment has a proven track record of reliability based on multiple gigawatts of power plants using this technology permitted, financed, installed, and operating across North America. Power capacity would be sized to ensure full capacity output up to 50 degrees Celsius and down to -20 degrees Celsius to withstand climactic extremes. The solar facility would provide around 1,000 gigawatt hours (GWh) of electricity per year. The solar facility would operate for approximately 4,000 hours per year (daylight hours). Operation and maintenance procedures would be consistent with manufacturers and industry standard practices to maintain the useful life of the plant components.

Solar panels would be electrically connected using string wiring secured to the panel support system. String wiring terminates at PV array combiner boxes or load break disconnect boxes, which are lockable electrical boxes mounted on or near an array's support structure. Output wires from combiner boxes would be routed along an underground trench system approximately 3 to 6 feet deep and 1 to 6 feet wide, including trench and disturbed area, to the central inverter pads. Inverters are a key component of solar PV power-generating facilities because they convert the solar panel's direct current (DC) power generated by the solar panel into alternating current (AC) power and step up the voltage. The output voltage of the inverters would be stepped up to 600 to 1200V DC to 34.5kV AC power and transmitted by underground collection lines to the project substation.

2.4.2 *Substation*

The 140,000-square-foot high-voltage substation would be located adjacent to Area 1 and Area 2 on a raised gravel pad and would have a maximum height of 35 feet (see Figure 2-7 and Figure 2-8). The substation would include the main Generation Step Up (GSU) transformer, high-voltage circuit breakers, switches, meters, instrumentation transformers, relay equipment, a control enclosure, and related equipment. The substation equipment would be mounted on concrete foundations and steel structures (hot dip galvanized or weathering steel).

The substation is where all the underground 34.5-kV collection lines running from the arrays are combined and the voltage is then stepped up to 500 kV via the GSU for use with the transmission network. All interconnection equipment, including the control room, would be installed aboveground on concrete foundations and steel structures within the substation footprint. Transformers would utilize radiators with passive and active fans for airflow to dissipate heat in the substation transformers. A permanently gated, 8-foot-high chain-link fence with three-strand barbed wire meeting National Electric Safety Code requirements would be constructed around the substation.

Power to the substation control enclosure would be provided primarily by a station service transformer (roughly 50 kilovolt amps [kVA]) located within the substation yard. This transformer will be fed from the medium voltage bus within the substation yard. The control enclosure would be equipped with a backup battery and an energy management system capable of powering the control enclosure for 48 hours in the event of an outage. In the event of a prolonged outage, a secondary station service power connection will be provided via connection to the Chaves 12 KV circuit running parallel to the I-15, which is part of the SCE Kramer 220/115 kV system. Power from the 12 kV circuit will be provided via an overhead distribution line.

2.4.3 *Switchyard*

The switchyard would be set on an approximately 234,300-square-foot raised gravel pad and would have a maximum height of 100 feet. The switchyard would be located 0.8-mile northwest of I-15, adjacent to the LADWP Mead-Adelanto 500-kV transmission line ROW. The switchyard would include the High Voltage Bus Structure, high-voltage circuit breakers, switches, instrumentation transformers, relay equipment, a control enclosure, and related equipment. The switchyard equipment would be mounted on concrete foundations and steel structures (hot dip galvanized or weathering steel). A permanently gated, 8-foot-high chain-link fence with three-strand barbed wire meeting National Electric Safety Code requirements would be constructed around the switchyard.

Power to the switchyard control enclosure would be provided primarily by a station service transformer (roughly 50 kVA) located within the switchyard. To meet reliability standards, there will be two station

service transformers, primary and backup. The control enclosure would be equipped with a backup battery and an energy management system capable of powering the control enclosure for 48 hours in the event of an outage. In the event of a prolonged outage, a secondary power source will be provided via an underground connection to Kramer 115-kV sub-transmission line owned by SCE, which runs parallel to I-15.

The foundation of the substation and switchyard would include both concrete pads and concrete piers. Foundation design considerations include the area-specific geotechnical characteristics, ice and wind loading, short circuit forces, seismic forces, and more as required by industry best practices, Institute of Electrical and Electronics Engineers standards, and regional requirements. Foundation and structural design would take into consideration all seismic and flood considerations for the Project-specific location.

The switchyard was sited to minimize the gen-tie length. The revised substation location was chosen to optimize the transmission and distribution losses and capital expenditures.

2.4.4 *Gen-tie Line*

The approximately 200 foot wide, 1-mile long 500 kV gen-tie line would run from the project substation, just southeast of I-15, to the switchyard and then to the point of interconnection with the existing LADWP Mead-Adelanto transmission line. The approximately 1-mile 500-kV gen-tie line would be designed in accordance with LADWP design standards including required right-of-way (ROW) width. The gen-tie line has been sited to minimize overall distance and avoid unnecessary road and pipeline crossings, where possible. The gen-tie would be designed in accordance with LADWP design standards including required right-of-way width. The gen-tie would also use approximately eleven tubular steel pole support structures and approximately six lattice towers, all of which would be approximately 160 feet high. More or less towers and pole support structures may be required to be utilized by LADWP design standards during final design. A small segment of the gen-tie line, approximately 450 feet, would cross I-15. If this crossing segment of the gen-tie line runs underground in a bore, then on either end of this underground section there would be riser towers and transition to overhead tower structures. Alternatively, the gen-tie line may be placed overhead the I-15 rather than underground. The project includes both overhead and underground facilities which will conform to both CPUC General Order (GO) 98 and 128. CPUC GO 128 is applicable to the 34.5 kV elements of the project which are largely underground. CPUC GO 98 is applicable to the overhead electrical facilities, primarily segments of the 500 kV gen-tie that are not underground. The project will be designed in accordance with the required GO's both with respect to grounding, duct banks, derates, clearances, and soil resistivity and general conditions.

2.4.5 *Transmission System*

The project does not require the need to construct any new or additional electrical transmission system components off-site. Existing infrastructure surrounding the site includes two high-voltage electric transmission lines, an electrical distribution line, wireless cellular telephone towers, two fiber-optic cables, and two fuel pipelines. The two high voltage electrical transmission lines to the west of I-15 are a 115-kV subtransmission line owned by Southern California Edison and the Mead-Adelanto 500-kV transmission line operated by LADWP. The project would interconnect into and bisect the LADWP's 500-kV Marketplace-Adelanto Transmission Line 1 as the primary POI, which has ample unused capacity therefore eliminating the need for new transmission lines to be constructed off-site. The project would interconnect at the 500 kV level due to the size of the project. The 500 kV gen-tie line has been sited to minimize overall distance and avoid unnecessary road and pipeline crossings, where possible.

2.4.6 *Battery Energy Storage System (BESS)*

A BESS absorbs, holds, and then reinjects energy from the PV system into the electrical grid. The project is anticipated to include up to 300 MW/1200 MWh of energy for dispatch into the local electrical grid via the same point of interconnection as the solar arrays. The BESS would be located adjacent to the substation and Area 1. Eighteen acres of the project site would be utilized for the BESS throughout the project site at full buildout.

2.4.6.1 BATTERIES

Individual lithium-ion or similar cells form the core of the BESS and are assembled in sealed battery modules. The battery modules would be installed in self-supporting racks electrically connected either in series or parallel to each other. The operating rack-level DC voltage currently ranges between 700 and 1,500 volts (V). The individual battery racks are connected in series or a parallel configuration to deliver the BESS energy and power rating.

2.4.6.2 BATTERY ENERGY STORAGE SYSTEM ENCLOSURE AND CONTROLLER

The BESS containers would house the batteries described above, as well as the BESS unit controllers. There would also be a BESS Site Energy Management System controller, located in a pad mount enclosure within the BESS yard. The BESS site controller is a multilevel control system for the battery modules, power conversion system, medium-voltage system, and takes commands from the Plant SCADA controller which regulates overall plan output. The controllers ensure that the BESS effectively mimics conventional turbine generators when responding to grid emergency conditions. The BESS enclosure would also house required heating, ventilation, and air conditioning (HVAC) and fire protection systems. The battery storage containers would be built using standard International Organization for Standardization (ISO) shipping containers, and each would measure approximately 20 feet in length, 6 feet in width, and 8 feet in height, although other smaller form-factor structures exist that may be used.

The safety system would include a fire detection, alarm, and suppression control system that would be triggered automatically when the system senses imminent fire danger. A fire suppression control system would be provided within each on-site battery enclosure. The safety system would use either a waterless evaporating fluid, a sustainable clean agent (not a hydrofluorocarbon clean agent), or an alternative suppression agent, such as an inert gas. The control system would also notify the project operators and could be configured to notify local first responders as well.

2.4.7 *Operation and Maintenance Area Facilities*

2.4.7.1 BUILDINGS

Three buildings related to operations, maintenance, and storage would be constructed as part of the project. One building would be 2,400 square feet, and the other two buildings would each be 5,000 square feet in area. All buildings would be painted BLM color scheme Sudan Brown. These buildings would be in the northwest portion of the site next to the BESS facilities. All of these facilities would be monitored by on-site O&M personnel and/or remotely.

The project would power the O&M buildings via a 480-V circuit from the BESS Auxiliary Power distribution system. This circuit will be fed from the collector substation and transformed to 480 volts via an auxiliary transformer mounted at the BESS yard. Power will be distributed via 480-V switchgear at the BESS yard. Power distribution will be via underground cables. Backup power to the O&M facilities would be via a local microgrid. This system would consist of solar PV panels mounted to the roof of the O&M buildings, a backup battery providing 24 hours of standby power, and an automatic transfer switch. This connection removes the need to have an emergency generator as part of the proposed project.

2.4.7.2 PARKING AREAS

A 13,200-square-foot parking area would be located adjacent to the buildings described above, in the southwest corner of the site. They would be composed of compacted soil covered with filter fabric and 4-12" of compacted Class II aggregate base. The parking areas are not expected to exceed approximately 0.33 acre, or 13,200 square feet. Parking would be provided for the anticipated employees during project operation, for visitors, and for other equipment anticipated to be on-site at any time.

2.4.7.3 ACCESS ROADS

Primary operational access to the project site would be provided via the existing Rasor Road, that runs from I-15 eastward to the Rasor OHV recreation area (Figure 2-11). The portion of Rasor Road on BLM land would serve as the entrance and primary access road within the site and is approximately 0.4-mile in length. The project would improve, maintain and slightly re-route in places this portion of Rasor Road up to 26 feet wide and minor improvements will be made within both Caltrans and San Bernardino County right-of-way to improve the road conditions so that heavy trucks can utilize the route.

Rasor Road will be permanently open to the public during both project construction and operation. In order to allow public access to the Rasor OHV recreation area. Rasor Road would continue to serve as the main access point for the public into the Rasor OHV recreation area. During project construction and operation, the public would access the Rasor OHV area by traveling through the on-site portion of Rasor Road that has been improved, maintained and aligned to avoid solar panels throughout the project site. Rasor Road would be located between Array 3 and Array 4 and would continue to allow public access to the Rasor OHV recreation area. The solar arrays would be fenced and gated to ensure no public access to the project facilities.

Currently, Arrowhead Trail splits off of Rasor Road and runs north-south. During project construction and operation, Arrowhead Trail would be closed permanently. The project would construct internal access road(s) which lead to the substation and BESS and between the solar arrays. These internal access roads would be up to 26 feet wide and include a 50-foot turning radius at the project boundary.

Northwest of I-15, the project would use an existing travel route (CL 8847 and CL7682 from Zzyzx Road). CL 8847 and CL7682 are existing roadways that are publicly accessible. These roadways would not require any improvements during project construction or operation. As an alternative, the project may also construct and use a new temporary exit off southbound I-15 near the gen-tie corridor to access the gen-tie line corridor and switchyard.

All new on-site access roads would consist of compacted native material and would be graded as necessary but would generally follow the existing terrain covered with filter fabric and 4 to 12 inches of compacted Class II aggregate or amended with Class II aggregate only where native soils are not suitable for heavy traffic. Larger boulders that could impede vehicle access would be removed. These permanent access roads would be compacted to meet load requirements for vehicle traffic over the life of the project.

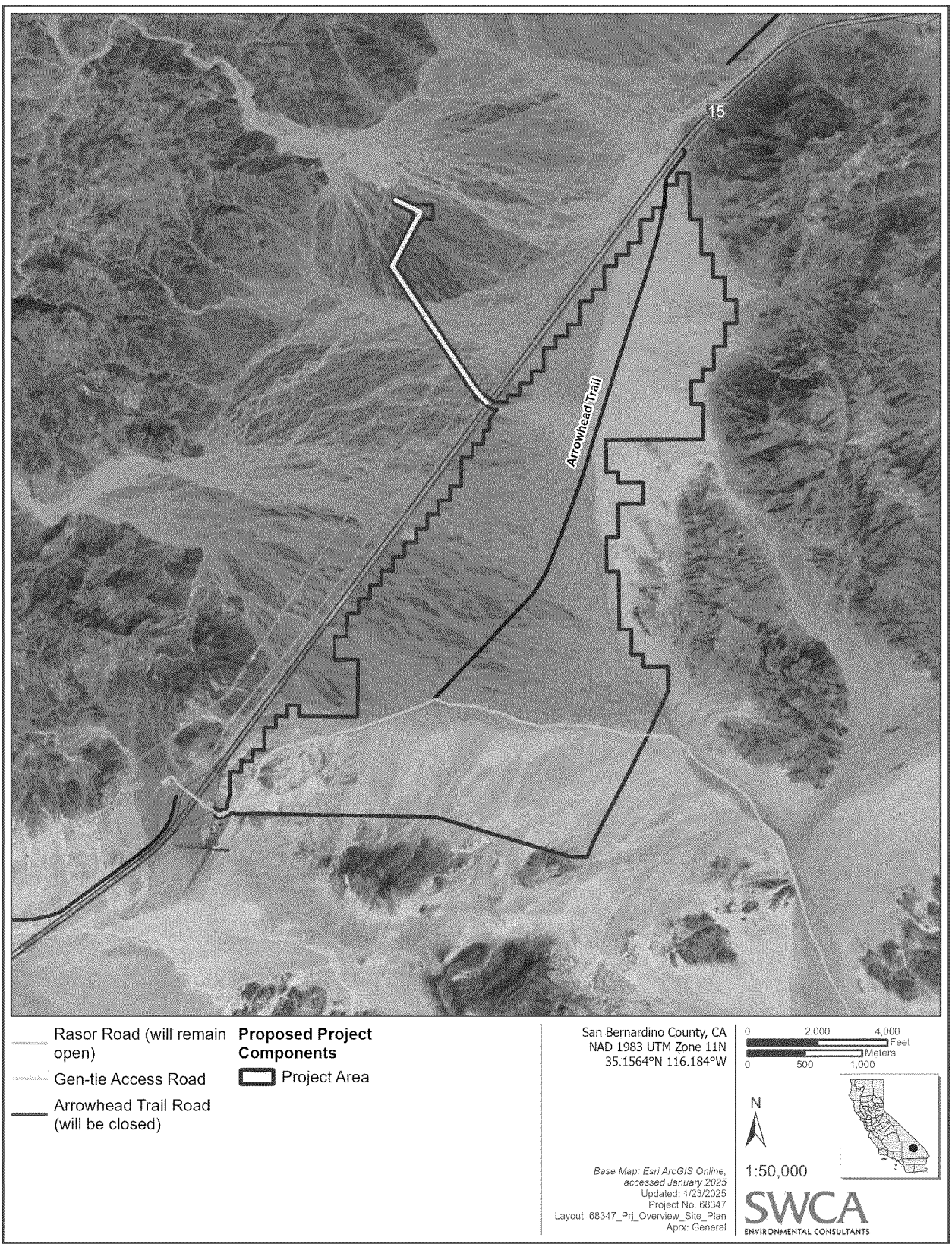


Figure 2-11. Existing and proposed roadways.

2.4.7.4 SITE SECURITY AND FENCING

All project components would be surrounded by warning signage, perimeter security fencing, desert tortoise exclusionary fencing, and perimeter security cameras. Combined security and desert tortoise fencing would be installed surrounding each individual array field and extend to include the substation and BESS area. A permanently gated, 8-foot-high chain-link fence with three-strand barbed wire meeting National Electric Safety Code requirements would be constructed around the substation and the switchyard. The line posts and terminal posts of the fence would be buried up to 3.5 feet deep, and the distance between posts would be approximately 10 feet. All permanent tortoise exclusionary fencing would be constructed in accordance with Chapter 8, Desert Tortoise Exclusion Fence, of the USFWS's 2009 Desert Tortoise Field Manual (USFWS 2009).

2.4.7.5 LIGHTING

During construction, lighting would be strategically located for safety and security in the construction trailer staging area, parking area, and around site security facilities. Lighting would be located on temporary service poles. Power for the lights would come from the proposed distribution line or construction office trailer generator. Lighting is not planned for construction activities; however, if required, it would be limited to the locations and amounts needed to ensure safety. It would be focused downward, shielded, and directed toward the interior of the site to minimize light exposure to areas outside the construction area.

During operation and maintenance, lighting would be provided at the Rasor Road site entrance, O&M buildings, substation, and switchyard. Some portable lighting also could be required for essential nighttime maintenance activities or troubleshooting in the event of an outage event. All lighting would be kept to the minimum required for safety and security; sensors, motion detectors, and switches would be used to keep lighting turned off when not required. All lights would be hooded and directed to minimize backscatter and off- site light. All lighting would be compliant with San Bernardino County Dark Skies Ordinance.

During site closure and decommissioning, safety and security lighting would be provided using a combination of the installed lighting system and portable lighting, if required. As with the other project phases, lighting would be focused downward, shielded, and directed so as to minimize light exposure to areas outside the work area.

2.4.8 *Landscaping*

The project would plant a variety of native and drought tolerant trees and shrubs along the western boundary of the project site. There would be approximately 30 acres of landscaped areas on-site, including up to 5 acres of irrigated landscaped areas. Irrigation would occur as needed.

The Applicant would maintain existing native vegetation to the extent possible. However, project construction may require that existing desert scrub vegetation be removed from portions of the project area. Additional acreage would be cleared of vegetation to allow for installation of buildings, the substation, access roads, fencing, and collector lines. Surface treatments, such as grading, disking, or mowing, can create potential habitat for non-native or invasive species that infiltrate the area. The Applicant has prepared Pesticide Use Proposals (PUPs) and an Integrated Weed Management Plan (IWMP) to minimize impacts from pesticides and invasive weeds.

2.4.9 *Drainage and Erosion Control*

Grading of up to 2,059 acres and other types of ground treatment would be conducted outside of existing major drainage channels and would not involve substantial changes to site topography. Once construction is complete, the topography beneath the solar panels would generally be the same as the baseline condition except in areas where soil has been compacted or rocks and isolated surface undulations have been removed by grading. Native vegetation would be allowed to reestablish naturally and would be trimmed during operation as necessary.

Security fencing would not be used in the major drainage channels in between the array fields to minimize impacts to wildlife corridors and stormwater flow. If needed along larger drainages, breakaway fencing would consist of a driven post with detachable connections just above ground level, which allow the fencing to yield to the force of a storm event without damage to the embedded portion of the post. Following such an event, the fence would be reattached to the post. The entrance to each access road along the perimeter would include a security gate.

The design of the array fields would avoid placing solar panels within the stormwater flow corridors downstream of the existing culverts under I-15 so that flows from the culverts would continue to follow existing braided flow channels. Three drainage channels would be constructed between the array fields. Each channel would be approximately 3 feet below grade and vary in width and length. Approximately ten temporary sediment basins of varying sizes and depths would be constructed adjacent to the drainage channels and throughout the site and removed at the conclusion of construction.

Development within the channels would be limited to access road crossings and potential subsurface collector lines. Approximately twelve box culverts and eight low-water crossings would be installed at the intersection of access roads and drainage channels, and permanent protection berms would be constructed along the edges of the arrays near these flow corridors to prevent occasional side channel flows from entering the array fields. Temporary and permanent fiber rolls would also be installed on slopes before they transition into steeper slopes to control runoff. All fiber rolls would be made of natural materials and weed free.

2.4.10 *Solid Waste and Hazardous Materials Management*

Construction would generate solid waste. As part of the project, a Waste Management Plan has been completed. A full-time crew would be responsible for maintaining site cleanliness during construction, including collecting trash at the temporary construction facility and the various work fronts. All trash would be placed in containers with secure lids. All hazardous and non-hazardous waste would be stored in appropriate containers for off-site disposal. All waste generated during construction would be stored in wind-proof and wildlife-proof containers that periodically would be transported to an off-site disposal facility authorized to accept the waste. During construction, portable sanitary facilities would be located in the project area and maintained by a local contractor.

During operations and maintenance, some PV panels would require replacement due to breakage or other damage or to take advantage of new technologies or address degradation of electrical capacity. Removed PV panels would be recycled or disposed of in accordance with applicable local, state, and federal standards and regulations.

Hazardous materials that may be used and stored during construction and/or operations and maintenance could include gasoline and diesel fuel, paints, thinners, solvents, sealants, lubricants, hydraulic fluids, herbicides. Facility transformers would contain non-polychlorinated biphenyl (PCB)-rated dielectric fluid. Due to the non-hazardous nature of these transformer fluids, secondary containment is not required.

Facility breakers may contain SF6 gas insulating fluid depending on final design but will comply with California Air Resources Board regulations. The Waste Management Plan outlines the nonhazardous and hazardous waste streams associated with construction and operation of the project. The Waste Management Plan also identifies the waste disposal sites that may be feasibly used for disposal, including name, location, classification, daily and annual permitted capacity, daily or annual amounts of waste currently being accepted, estimated closure dates and remaining capacity and a description of any enforcement action taken by local or state agencies due to waste disposal activities.

Hazardous materials would be stored within secondary containment to control any potential leaks of oils, grease, fuels, and other hazardous materials stored at the project site. All potential contaminants would be stored and used at least 50 feet from any defined or constructed channels or basins at all times. If quantities exceed regulatory thresholds, a spill prevention control and countermeasure (SPCC) plan would be developed prior to project construction in accordance with applicable regulations and would include a facility diagram that would identify the location and contents of hazardous materials containers; potential equipment failures; containment and diversionary structures; facility drainage; personnel, training, and spill prevention procedures; and emergency contact information. Diversionary structures meeting the requirements of the SPCC plan would be provided for oil-containing equipment, including transformers, at the project site. Transformers would be inspected on a regular basis to detect and respond to any leakage.

All use, storage, transport, and disposal of hazardous materials associated with the project would be done in strict accordance with federal, state, and local regulations and guidelines. Employees would be trained in the appropriate protocol for notification and cleanup of hazardous materials. Additionally, the site would be supplied with adequate spill containment kits and personal protective equipment in case of a release. Construction equipment and maintenance trucks would be maintained at all times to minimize leaks of motor oils, hydraulic fluids, and fuels. No extremely hazardous materials would be produced, used, stored, or disposed of as a result of the project.

Most of the fuel required by construction and operation staff vehicles and engines would be procured at commercial gas stations in the local area, such as at the service station at Rasor Road or in Baker. A limited amount of #2 diesel and gasoline petroleum fuels (approximately 500 gallons each) may be stored in the staging areas in above grade steel tanks with secondary containment. In addition, every transformer in the substation would have concrete oil containment. In the case that a leak occurs or a transformer fails, oil containment would be made to capture and store oil from transformers. The purpose of containment would be to keep transformer oil out of the ground. Material Safety Data Sheets for the hazardous materials that are expected to be used and/or stored on-site would be retained at the on-site office.

2.5 Construction Activities

The following sections provide details about the timeline and process for construction of the project. Once construction is complete, the project would operate for approximately 40 years. Construction would begin in the second quarter of 2026, and initial operation would begin in the fourth quarter of 2027. Full-scale commercial operation is anticipated to begin by the second quarter of 2028.

2.5.1 *Construction Schedule and Workforce*

Construction of the project is anticipated to begin in the second quarter of 2026 and occur over an approximately 18-month period and consist of overlapping construction stages. Stage 1 would include

mobilization, site preparation as required, grading as required, fencing, preparation of roads and laydown areas, and installation of measures in the Stormwater Pollution Prevention Plan (SWPPP) as well as erosion control features. Stage 2 would include installation of solar array structural components including piles, racking systems, and foundations. Stage 3 would include installation and makeup of electrical equipment including trenching to install cables and installation of the solar and BESS inverters, solar panels, battery storage systems, gen-tie, switchyard and ancillary equipment, and would also include trenching activities to install cables and other electrical equipment. Stage 4 would include inspections, testing, and commissioning. The approximate duration of the states is as follows: Stage 1 would be from months 1 to 8, Stage 2 would be from months 4 to 12, Stage 3 would occur during months 10 to 16, and Stage 4 would occur during months 15 to 18. An average of 200 construction workers would operate daily on-site, with an anticipated 300 construction workers during peak construction activities.

The typical construction work schedule is expected to be from 6:00 a.m. to 6:00 p.m., Monday through Friday. However, to meet schedule demands or to reduce impacts, it may be necessary to work early mornings, evenings, or on weekends during certain construction phases. The work schedule may be modified throughout the year to account for changing weather conditions (e.g., starting the workday earlier in the summer months to avoid work during the hottest part of the day for health and safety reasons). If construction work takes place outside these typical hours, activities would comply with San Bernardino County standards for construction noise levels. For safety reasons, certain construction tasks, including final electrical terminations, must be performed after dark when no energy is being produced. The project would use restricted nighttime task lighting during construction. Lighting would include only what is needed to provide a safe workplace, and lights would be focused downward, shielded, and directed toward the interior of the site to minimize light exposure outside the construction area.

2.5.2 *Preconstruction Activities (Stage 1)*

Prior to construction, all contractors, subcontractors, and other on-site personnel would receive Worker Environmental Awareness Program (WEAP) training regarding the appropriate work practices necessary to effectively understand and implement the biological commitments in the project description, implement the mitigation measures, comply with applicable environmental laws and regulations, avoid and minimize impacts, and understand the importance of these resources and the purpose and necessity of protecting them.

Qualified biologists would conduct preconstruction surveys for sensitive species. Sensitive resource areas would be flagged so they are avoided or appropriately managed during construction. Preconstruction field survey work would include identifying precise locations of the project site boundary and desert tortoise and security fencing. Construction staging areas would be established for storing materials, construction equipment, and vehicles. These features would be subsequently staked in the field. No paint or permanent discoloring agents would be applied to rocks or vegetation to indicate survey or construction limits. All off-road construction vehicle travel, fence installation, and staging area establishment would be surveyed and/or monitored by qualified biologists, archaeologists, and tribal monitors, as appropriate. The preconstruction field surveys would be conducted during daylight hours, and vary in length and timing, depending on the species found on-site. The proposed WEAP training would be required before a worker would be allowed to work on the site. These trainings would also occur on a continuous basis during construction. Onsite water wells would be drilled during Stage 1.

2.5.3 *Site Preparation (Stage 1)*

As shown in Figure 2-12, approximately 2,059 acres throughout the site would be disturbed. Grubbing and grading would be required at roads, laydown areas, BESS yard, substation yard, and switchyard to level rough or undulating areas, including around roads and laydown areas, as well as the BESS yard,

substation yard, and switchyard. Grubbing and grading would also be required to prepare soils for concrete foundations for substation equipment, inverters, energy storage systems, and the operations and maintenance buildings. Grubbing would involve the removal of vegetation from the construction site, while grading would include earthwork to achieve a certain base or slope. Mowing, minimal grubbing, and grading may also be required in the array areas to prepare the site to receive pile foundations. There would be approximately 630,000 cubic yards of cut and 180,100 cubic yards of fill, thus requiring approximately 449,900 cubic yards of cut on-site. The 449,900 cubic yards of net cut would be distributed throughout the project disturbed area.

Per Mojave Desert Air Quality Management District Rule 403, as part of project construction, the applicant would develop a Dust Control Plan that describes all applicable dust control measures to address construction-related dust (Mojave Desert Air Quality Management District 2020). Further, a SWPPP or SWPPP-equivalent document required by the Lahontan Regional Water Quality Control Board (RWQCB) would be prepared by a qualified engineer or erosion control specialist and would be implemented before construction. The SWPPP would be designed to reduce potential impacts related to erosion and surface water quality during construction activities and throughout the life of the project. It would include project information and best management practices (BMPs). The BMPs would include dewatering procedures, stormwater runoff quality control measures, concrete waste management, stormwater detention, watering for dust control, and construction of perimeter silt fences, as needed.

2.5.4 *Solar Array Assembly and Construction (Stage 2)*

Construction of the solar arrays would begin with the installation of array support posts, which would be driven into the soil using a pile/vibratory/rotary driving technique to a depth of approximately 6 to 12 feet. Single-axis solar tracking structures would be fastened to the support piles. Once the support structures are in place, solar panels would be attached to the support frame. The assembled groups of solar panels would be wired together into strings through connectors on the back of the modules. Assembled panel sections would then be connected to combiner boxes located throughout the arrays that would deliver power to the inverter. Output wires from combiner boxes would be routed along an underground trench system approximately 3 to 6 feet deep and 1 to 6 feet wide, to the central inverter skid. Central inverters would be mounted on concrete pads or driven piles. Central inverters would be brought in by tractor-trailers through the Rasor Road site entrance and delivered directly to the mounting pad sites where they are placed by mobile crane.

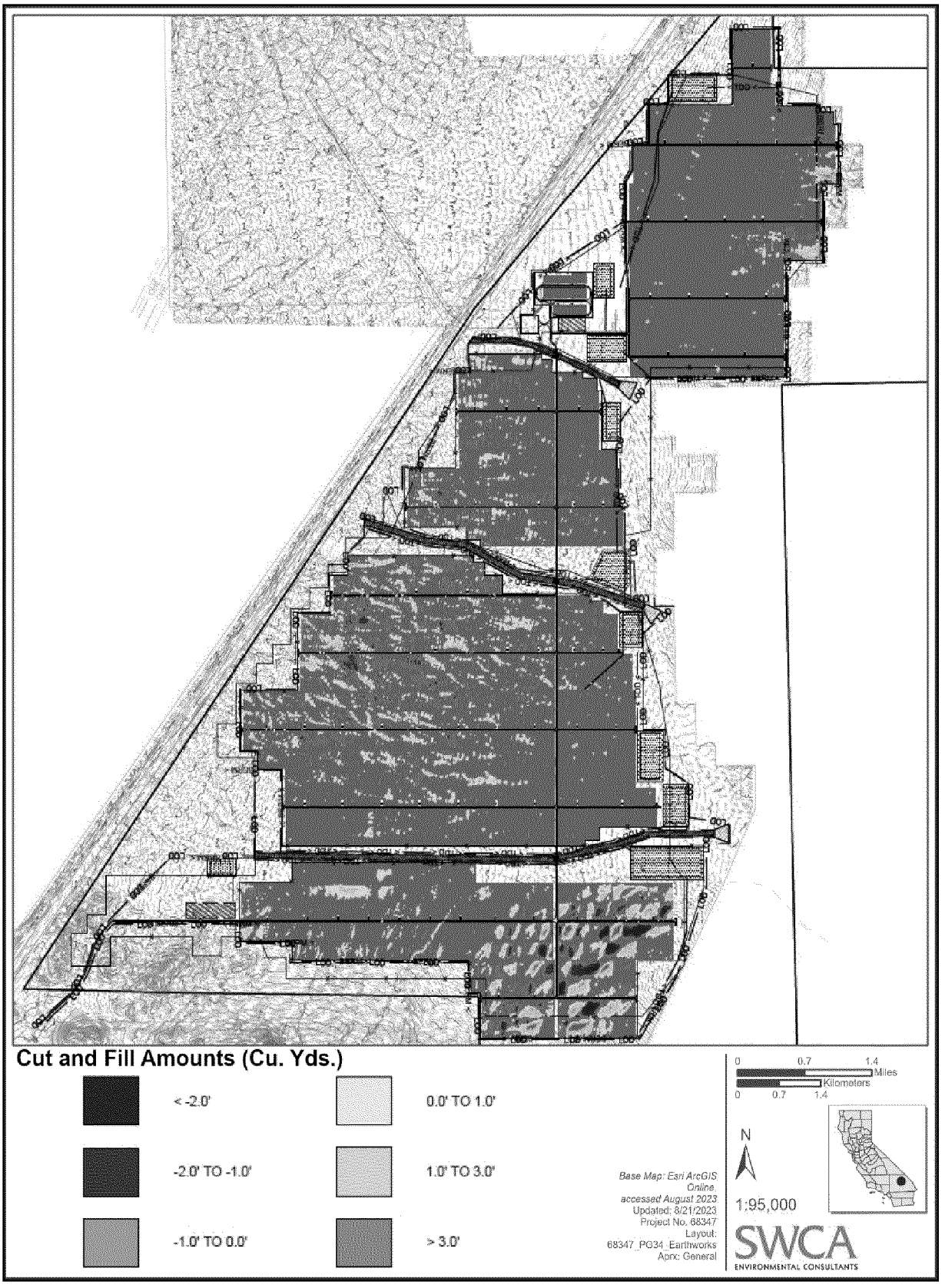


Figure 2-12. Proposed earthwork.

2.5.5 *Substation, Switchyard, and Gen-tie Construction (Stage 3)*

Construction of the project substation, switchyard, gen-tie and interconnection to the Mead-Adelanto 500-kV transmission line would occur concurrently with the construction of the solar arrays. To construct the 500kV transmission line connection from the project switchyard to the existing Mead-Adelanto line, approximately, one tower would be removed from the existing line, and multiple new tower structures would be constructed adjacent to the removed tower. The new towers would carry the 500-kV transmission line into and out of the new switchyard. The sequence of construction would be to install the new towers and equipment, string the new line, then request and outage to cut in the new line to the existing Mead-Adelanto line.

The project gen-tie line from the switching station to the project substation would be installed using concrete caisson foundations or driven poles. Upon installation of all poles, the line insulators and switches would be installed. Upon installation of all line equipment, the conductors would be strung along the poles.

The substation and switchyard would be graded and compacted to an approximately level grade and raised above the adjacent grade to prevent flooding. Upon completion of the raised pad, concrete foundations and underground cabling, and a grounding grid would be installed including a grounding grid as required by the project design and applicable standards. Upon completion of the underground work, steel structures would be installed to mount equipment. Upon completion of the structures, substation equipment would be installed including transformers, switches, breakers, and control enclosures. Upon completion of equipment installation wiring and terminations at all equipment will be performed. Upon completion of all wiring, testing of equipment will be performed.

The approximately 1-mile 500-kV gen-tie line would be designed in accordance with LADWP design standards including required right-of-way (ROW) width. The gen-tie would also use approximately eleven tubular steel pole support structures and approximately six lattice towers, all of which would be approximately 160 feet high. More or less towers may be required to be constructed in compliance with LADWP design standards, during final engineering. A small segment of the gen-tie line, approximately 450 feet, would cross I-15 in an underground bore, and on either end of this underground section there would be riser towers and transition to overhead tower structures. Alternatively, the gen-tie may cross I-15 overhead, rather than underground.

2.5.6 *Electrical Construction Activities (Stage 3)*

Buried electrical lines for DC array wiring and AC wiring between inverters and transformers would then be installed using trenching machines. The trenches would be approximately 3 to 6 feet deep and 1 to 6 feet wide. The trenched areas would be backfilled and compacted after the cables are laid into place It is anticipated that the solar panels would require one washing during the construction phase prior to energizing and performance testing of the arrays in order to remove the dust that has accumulated on the panels during construction.

The medium-voltage collection cables would be trenched at depths up to 4 to 8 feet using a trenching machine. The trenches would be approximately 12 to 36 inches wide. Multiple trenches may be placed adjacent to each other, depending on the number of collector circuits in a particular location. The cables would be placed within the trenches in layers (as necessary) followed by backfill and compaction operation. Alternatively, a single pass trenching and cable installation machine could be used to automate the cable placement and backfill process. The main trenching operations would be for installation of DC

cables from the combiner boxes to the inverter skids and installation of AC collector circuits between inverter skids and the substation. The collector cable would be installed by circuit in conduits, with each circuit contained in a single 6-inch-diameter conduit (typical) spaced approximately 10 feet on center. The exact locations would be determined during detailed design.

2.5.7 *Construction Equipment and Materials*

Standard construction equipment would be used during construction, including earth-moving equipment (e.g., bulldozers, excavators, backhoes) and road-building equipment (e.g., compactors, scrapers, graders). Construction equipment would include air compressors, all-terrain passenger vehicles, backhoes, cranes, a drill rig, tractor-trailers, flat-bed trucks, telehandlers, pick-up trucks, pile drivers, trenchers, portable generators, and water trucks. Construction equipment and maintenance trucks would be maintained at all times to minimize leaks of motor oils, hydraulic fluids, and fuels. No extremely hazardous materials are currently anticipated to be produced, used, stored, or disposed of as a result of the project.

Most of the fuel required by construction and operation staff vehicles and engines would be procured at commercial gas stations in the local area, such as at the service station at Rasor Road or in Baker. A limited amount of #2 diesel and gasoline petroleum fuels (approximately 500 gallons each) would be stored in the staging areas in above-grade steel tanks with secondary containment.

Concrete would be required for building or structure footings and foundations and pads for inverters, transformers, water tank footings, and substation equipment. In areas where driven support posts are not practical for the solar arrays, pre-drilling and installation of posts with sand slurry may be used.

2.5.8 *Construction Vehicle Access and Traffic*

A Construction Traffic Control Management Plan has been prepared for the Project. All construction materials would be delivered by truck. Most truck traffic would occur on designated truck routes and major streets. Construction traffic would include periodic truck deliveries of materials and supplies, equipment, recyclables, trash, and other truck shipments, as well as construction worker commuting vehicles. Most construction equipment and vehicles would be brought to the site at the beginning of each construction phase during construction mobilization and remain on-site throughout the duration of the construction phase for which they were needed. Generally, the equipment and vehicles would not be driven on public roads while in use for the project. Equipment will be brought to site on trailers with permitted load as required by Caltrans.

The project is anticipated to generate a maximum of 600 daily vehicle trips from construction workers, 200 daily vehicle trips from heavy duty trucks and 34 daily vehicle trips from water trucks. The project would use a just-in-time delivery system with supplies and components delivered on a schedule to minimize on-site storage needs.

2.5.9 *Construction Water Supply and Use*

Project construction would take place over approximately 18 months. Water would be needed primarily for dust control and soil compaction during the first 90 days of grading activities, with small amounts used for sanitary and other purposes. The water for the project would be supplied from up to five newly constructed onsite groundwater wells or, alternatively or in addition, from an existing private offsite groundwater well. If the offsite source is used, this water would be trucked in from this well and stored in three permanent water storage tanks to support project operations. The existing offsite water well that

would be utilized is located at 58502 Death Valley Road, Baker, California 92309, approximately 11 miles northeast of the project site.

During Stage 1 and Stage 2 of construction, which includes the 90-day grading period, the project would require approximately 200,000 gpd, or approximately 336 acre-feet per year (af/yr). Water requirements in the second year of construction are expected to be less than 110 af/yr, or half of the requirement of the first year of construction.

Five temporary water tanks of 100,000 gallons would be brought on-site by truck to store water in anticipation of construction water needs. The tanks would be housed on trailers located along access roads or within areas that have been cleared for installation of project components. The tanks may be moved around the site as construction progresses and would be used to fill on-site water trucks. The temporary water storage tanks would be removed after construction. Water used for construction would be supplied from up to five newly-constructed onsite groundwater wells or, alternatively or in addition, from an existing offsite groundwater well.

2.6 Operation and Maintenance

The project would begin operation in 2027 and operate 7 days a week, 365 days a year, with an approximately 40-year anticipated lifespan. Operational needs at the site include monitoring and optimizing the power generated by the solar arrays and interconnection with the transmission lines, operating the Supervisory Control and Data Acquisition (SCADA) system, troubleshooting the collector lines and repairing damaged cables, connections, or equipment, performing preventative maintenance per manufacturer recommendations, and conducting panel-washing activities periodically through the year. Additional maintenance would be required to maintain the administrative buildings, fencing and signage, roadways, and other ancillary facilities at the site. The project will hire local workforce as available to perform operations and maintenance.

2.6.1 *Operation and Maintenance Workforce*

The project substation would be uncrewed during operation; however, a workforce of approximately 2 to 4 personnel would visit the substation on an as needed basis for maintenance, equipment operation, and/or security. The project would be remotely controlled, eliminating the need for permanent on-site employees. Final staffing levels and configuration would be based on the final site configuration and early operating and maintenance experience. The facility would not be accessible to the public, and access will be infrequent and limited to authorized personnel.

2.6.2 *Automated Facility Control and Monitoring System*

The project would be operated and monitored by means of a SCADA system located in the control building. Sensors located at each inverter, BESS, project weather station, project switches, and breakers would report operational parameters. Data access and the project PV and BESS systems would be controlled, either on-site or remotely, through a high-security system. The non-conductive fiber-optic communications cable would be co-located with the low-voltage DC and AC wiring to reduce environmental impacts. Personnel communication would use two-way radio/receptor stations, which would require a Federal Communications Commission (FCC) license.

2.6.3 *Operational Water Supply and Use*

Project operation would require water for potable use, dust control, panel washing, and fire protection. The water for the project would be supplied from up to five newly constructed onsite groundwater wells or, alternatively or in addition, from an existing private offsite groundwater well. If the offsite source is used, this water would be trucked in from this well and stored in three permanent water storage tanks to support project operations.

Water would be used to clean the PV panels; dust and dirt build-up reduces the amount of incoming solar radiation striking the active PV layer within the panel. To reduce this effect, panel washing would be conducted three times per year over a 3-week period during operations, or additionally as necessitated. The water would drain by gravity to panel-washing trucks for use. Panel washing would require approximately 2.8 af (912,384 gallons) of water per year. In total, an estimated 5.6 af/yr of water would be used for panel washing, dust control and suppression during operation.

Three 10,000-gallon water tanks would be located throughout the site near the operation and maintenance building, BESS, and adjacent to the solar arrays. The water tanks would provide storage of water used for fire suppression. The tank would not require a regular supply of water because the water would be withdrawn only in the event of a fire. The tank would be monitored periodically and refilled as needed to replace evaporative losses. For fire suppression water supply, the project would conform to County requirements, which incorporate National Fire Protection Association (NFPA) Standards 1142 and 13 by reference and provide minimum requirements for fire suppression water supply where no public water supply is available (Standard 1142) and sprinkler systems (Standard 13).

2.7 Decommissioning and Site Reclamation

When the project reaches the end of its useful life, structures and equipment would be removed for reuse or sold as scrap, and the land surface would be reclaimed. A Decommissioning and Site Reclamation Plan has been prepared for the project. Because site conditions are likely to change over the life of the project, and to ensure that the decommissioning and site reclamation plan addresses all necessary conditions, the draft will be finalized and approved by the BLM before decommissioning and reclamation activities begin.

Upon decommissioning, aboveground structures would be dismantled and removed from the site. Where required by the BLM, concrete pads or foundations would be demolished, and rubble would be removed to an off-site disposal facility authorized to accept the waste. Belowground facilities may be disconnected at the surface and left in place in conformance with guidance and approval from the BLM. New project access roads and corridors would be closed, with the exception of Rasor Road, which would remain accessible.

Decommissioning of the substation and switchyard would involve deconstruction of structures. Salvaged materials would be recycled to the extent possible. Material that cannot be recycled would be transported for disposal in authorized landfills. Underground cabling and conduit may be left in place. The substation and office/storage areas would be graded to approximate the natural contour.

The applicant would prepare and implement a final closure and reclamation plan addressing removal of structures and site restoration in conformance with BLM requirements at the time of decommissioning. Construction hours and site cleanliness practices would be approximately the same during decommissioning as during construction.

Gen-Tie Overhead I-15 Crossing Visual Simulation

Soda Mountain Solar Project

Sun and Weather

Sunny

Date: **10-2-24**

Photo Time: **12:08 pm**

Visibility:

Good — Poor

Air Quality: Good

Sun Azimuth: **171.44°**

Sun Angle: **49.56°**

Lighting Angle on Project: **Side Lit**

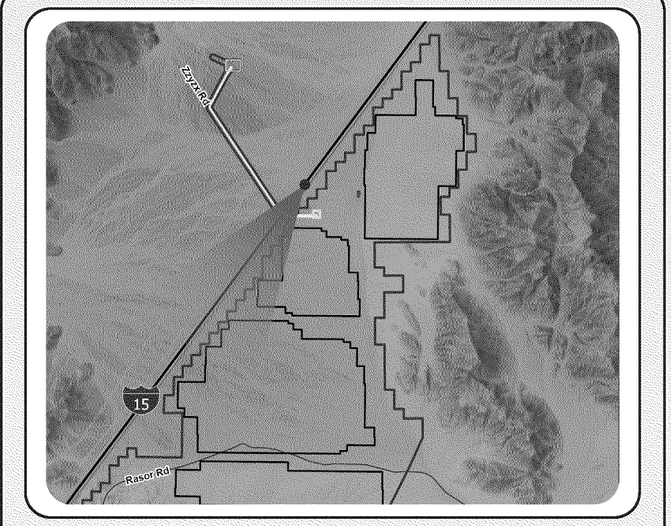
Wind: **0 mph**

Cloud Cover: **0 %**

Temperature (°F): **93°F**

Solar panels are represented at full tilt (60 degrees) facing east to reflect AM conditions. West-facing panels would be observed during PM conditions.

Simulation was prepared using information provided by client. Locations, colors, and heights may vary based on final engineering and design.



Key Observation Point (KOP)
Photography Angle
Local Road
U.S. Highway

Project Components
Solar Array
Proposed BESS Yard
Proposed Substation
Proposed Switchyard
Project Area
Proposed O & M Building
Gen-Tie Line

San Bernardino County, CA
NAD 1983 UTM Zone 11N
35.1588°N 116.177°W

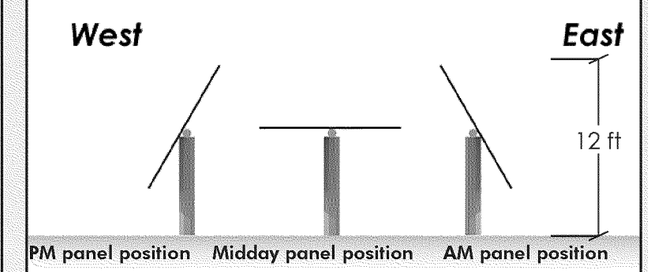
1:40,000

SWCA ENVIRONMENTAL CONSULTANTS

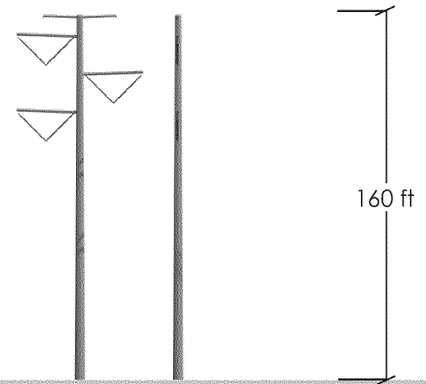
Approximate Distance to Nearest Transmission Pole: **0.25 mile**

Project Location

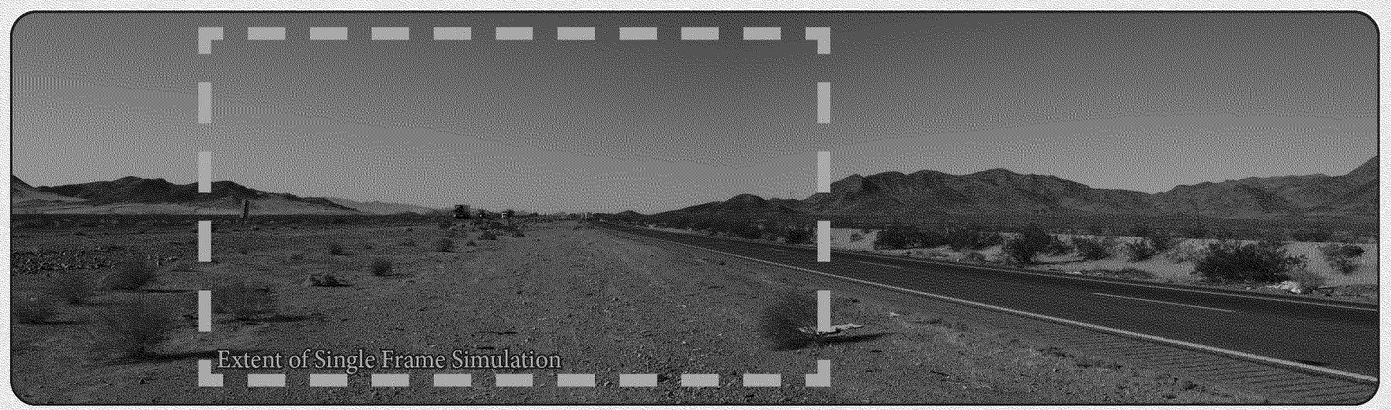
Solar Panel



Gen-Tie Monopole



Structure Diagram



KOP 10 - Interstate 15

Base Photographic Documentation

Latitude, Longitude (º): **35.1680, -116.1800**

Viewpoint Elevation (feet): **1390**

Camera Height (meters): **1.5**

Camera Heading (degrees): **215**

Camera Make & Model: **Sony Alpha 7R IV**

Camera Sensor Size (mm): **35.7 x 23.8 Full Frame**

Crop Factor: **1**

Lens Make & Model: **Sony FE 50mm F2.5G**

Lens Focal Length (mm): **50**

Image Size (pixels): **6720 x 4480**

Single frame simulation approximates 50mm full frame equivalent.

Viewing Instructions: Printed at 100% the resulting simulation is 16 inches wide by 10 inches high. At this size and focal length, the simulation should be viewed at arms length (24 inches). If viewed on a computer monitor, scale should be 100%.

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SMSP01154

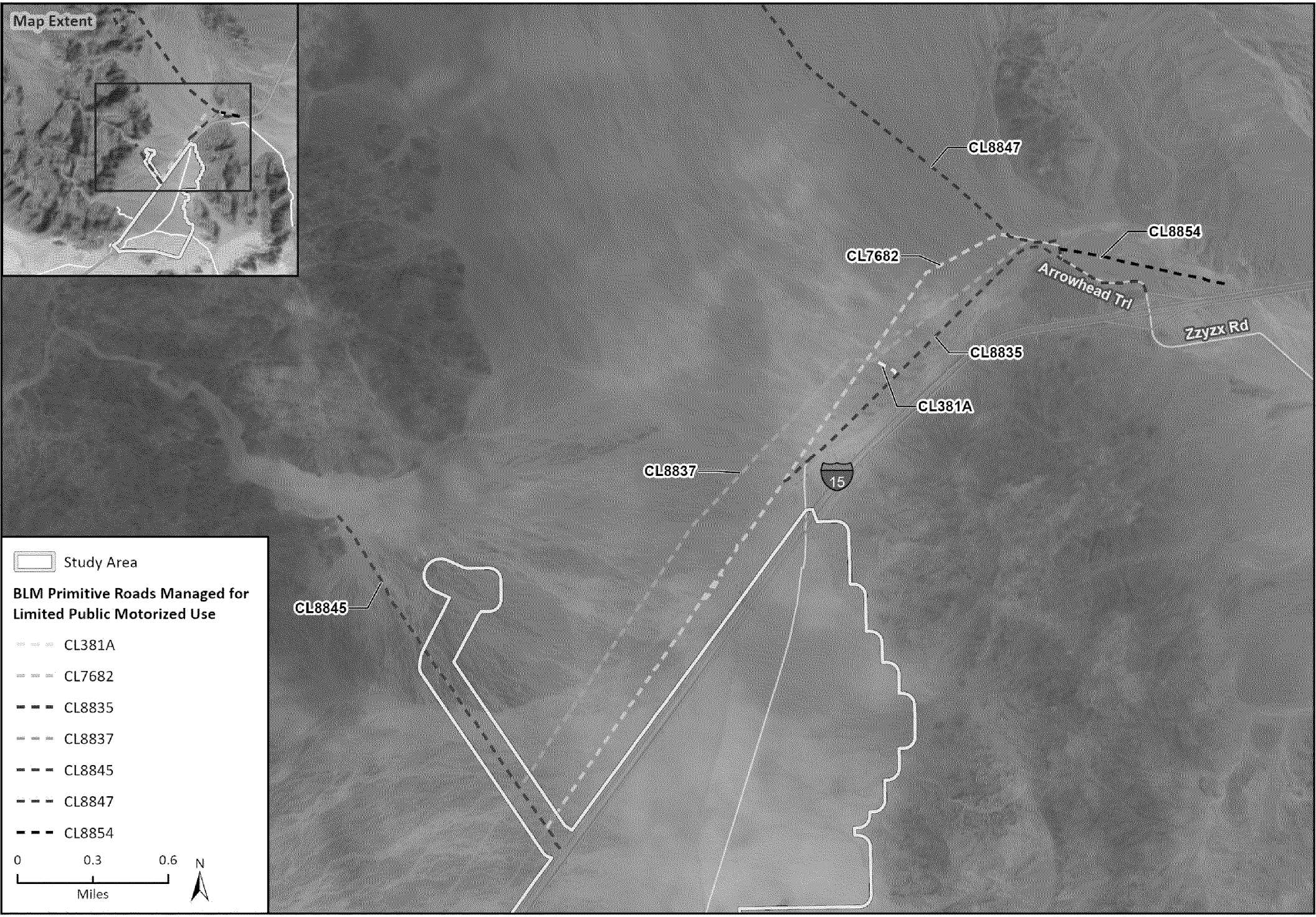


KOP 10: View from Interstate 15 looking southwest - Existing Condition



KOP 10: View from Interstate 15 looking southwest - Simulated Condition (Panels facing west)

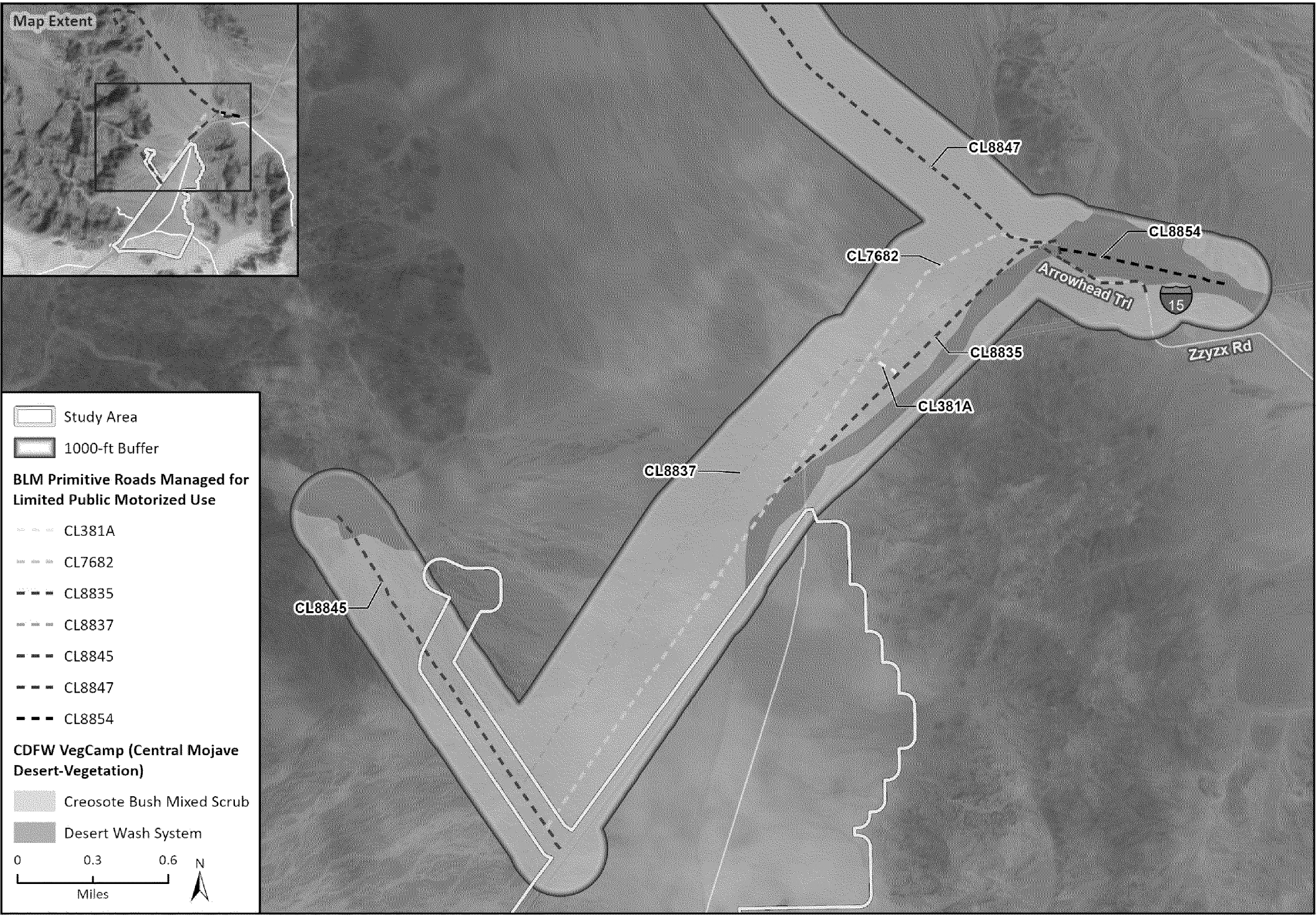
Access Road Figures
(REV 1 DR BIO-2)



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25-17245 BIO
Fig X Access Road Easement

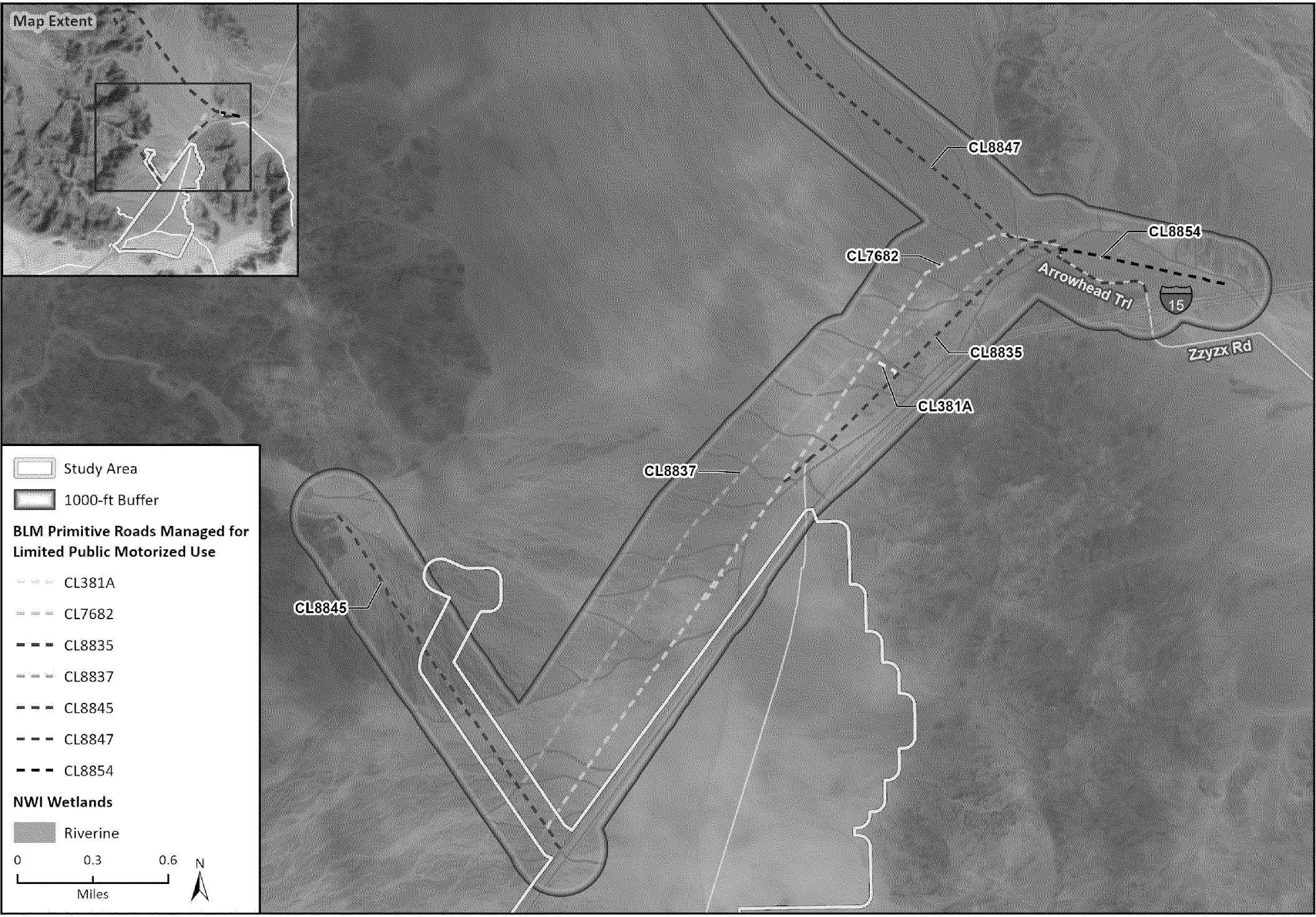
SMSP01158



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Additional data provided by NWI and CDFW, 2024.

25-17245 BIO
Fig X Access Road Easement

SMSP01159



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Additional data provided by NWI and CDFW, 2024.

25-17245 BIO
Fig X Access Road Easement

SMSP01160

Executive Summary Figure 1-1
(REV 1 DR ES-1)

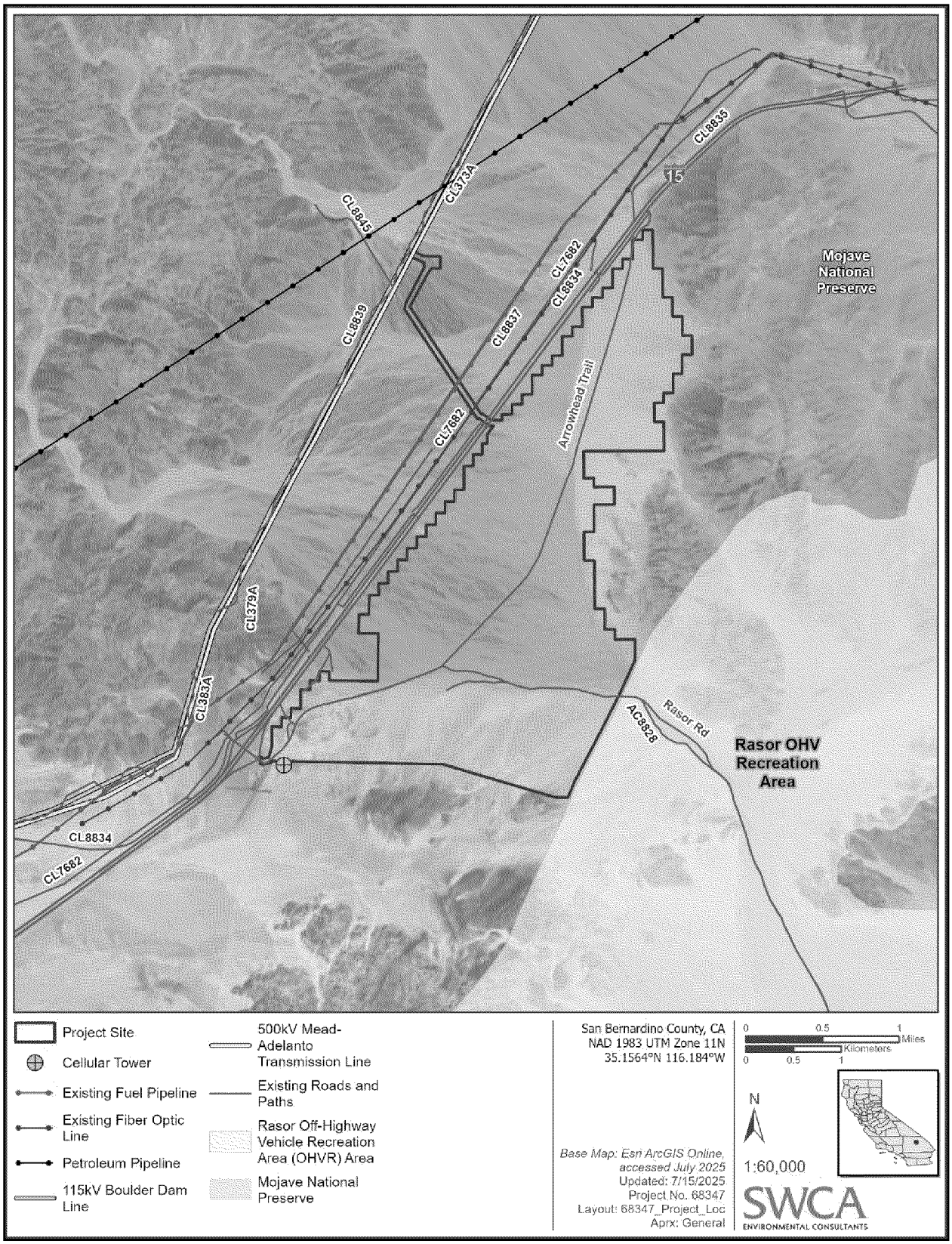


Figure 1-1. Project site location and existing conditions pre-construction.

From: Serna, Martin [mserna@sbcfire.org]
Sent: 8/27/2025 9:50:54 PM
To: Markloff, Curtis [CMarkloff@SBCFire.org]; Collin Crawford [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ebc874e994df437ba78978627476586f-c7d37eff-0f]; Paul Miller [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=4d4ce365f8bd442a8cb7d479381e2476-8906af8e-0e]; Allen, Jeffrey [JAllen@SBCFire.org]; Fleckenstein, Pat [PFleckenstein@SBCFire.org]
CC: Daniel Jones [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=352cfed2f4d849749d3d8f98a9563279-082cef18-97]; Fooks, Brett@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=870df74143964b71ada0039bf13c5a9a-Fooks, Bret]; Ronchetti, Monica [mronchetti@SBCFire.org]; Strong, Tom [TStrong@SBCFire.org]; John Carrier [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d823054932c444d18fdb316ac77c6d07-b2cf4468-54]
Subject: Re: Soda Mountain Solar Project - Notice of Information and Environmental Scoping Meeting -- August 29 2025 at 1 PM

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good afternoon

Thank you for the information and background. Battalion Chief Allen will attend the meeting and share our thoughts/concerns.

Respectfully

Martin A. Serna
Deputy Chief of Operations
San Bernardino County Fire
Phone:
909-387-5958
Mobile:
310-678-0442
Email:
mserna@sbcfire.org

One Mission-One Voice-One Team

From: Markloff, Curtis <CMarkloff@SBCFire.org>
Sent: Wednesday, August 27, 2025 2:32 PM
To: Collin Crawford <CCrawford@aspeneg.com>; Paul Miller <pmiller@therchgroup.com>; Allen, Jeffrey <JAllen@SBCFire.org>; Fleckenstein, Pat <PFleckenstein@SBCFire.org>; Serna, Martin <mserna@sbcfire.org>
Cc: Daniel Jones <Djones@therchgroup.com>; Brett Fooks <brett.fooks@energy.ca.gov>; Ronchetti, Monica <mronchetti@SBCFire.org>; Strong, Tom <TStrong@SBCFire.org>; John Carrier <jcarrier@aspeneg.com>
Subject: RE: Soda Mountain Solar Project - Notice of Information and Environmental Scoping Meeting -- August 29 2025 at 1 PM

Collin, thank you for the updated information.

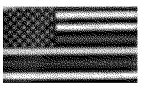
I have spoken with Assistant Chief of Operations Martin Serna and Battalion Chief Jeff Allen about the meeting on Friday and the concerns we need to address during the public comment period such as the impacts this project will have on the department and our lack of resources to respond to an emergency at this facility due to the location and project type.

Chief Serna and Chief Allen, please see the attached updated project description (Updated Project Description)
Worker safety plan (Appendix Q)
30% plans construction plans (Appendix A3 Engineering)
Meeting information (Notice of Information)
My email to Collin Crawford with Aspen Environmental outlining some of my concerns over the design process (RE: Soda Mountain Solar Facility)

Meeting link - https://energy.zoom.us/j/81021544506?pwd=16pHGtOBBimK7AICobIHb1wtGWfQJW.1

If you need anything else, please let me know

Curtis Markloff
Assistant Fire Marshal
Planning and Engineering Office
San Bernardino County Fire Protection District
909-918-2201



From: Collin Crawford <CCrawford@aspeneg.com>
Sent: Wednesday, August 27, 2025 1:58 PM
To: Markloff, Curtis <CMarkloff@SBCFire.org>; Paul Miller <pmiller@therchgroup.com>; Allen, Jeffrey <JAllen@SBCFire.org>; Fleckenstein, Pat <PFleckenstein@SBCFire.org>
Cc: Daniel Jones <Djones@therchgroup.com>; Brett Fooks <brett.fooks@energy.ca.gov>; Ronchetti, Monica <mronchetti@SBCFire.org>; Strong, Tom <TStrong@SBCFire.org>; John Carrier <jcarrier@aspeneg.com>
Subject: RE: Soda Mountain Solar Project - Notice of Information and Environmental Scoping Meeting -- August 29 2025 at 1 PM

Hi Curtis,

Again, thank you for taking the time to talk with us today. I'm attaching some of the updated information that the applicant has uploaded onto the project's docket.

Here's the link for the docket:
https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=24-OPT-03

As soon as we get the updated site plans, we'll send them your way.

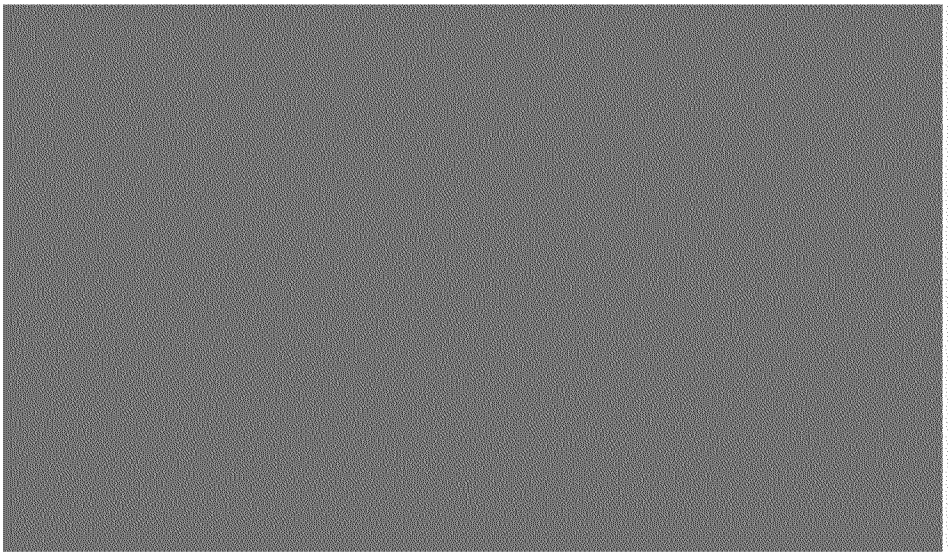
If you have any questions, please feel free to reach out to Paul or myself. Have a great rest of your week and we'll hopefully see you on Friday!

Best,

Collin Crawford-Martin
Environmental Scientist
Aspen Environmental Group
(916) 379-0357

From: Markloff, Curtis <CMarkloff@SBCFire.org>
Sent: Wednesday, August 27, 2025 8:50 AM
To: Paul Miller <pmiller@therchgroup.com>; Allen, Jeffrey <JAllen@SBCFire.org>; Fleckenstein, Pat <PFleckenstein@SBCFire.org>
Cc: Collin Crawford <CCrawford@aspeneg.com>; Daniel Jones <Djones@therchgroup.com>; Brett Fooks <brett.fooks@energy.ca.gov>; Ronchetti, Monica <mronchetti@SBCFire.org>; Strong, Tom <TStrong@SBCFire.org>

Subject: RE: Soda Mountain Solar Project - Notice of Information and Environmental Scoping Meeting -- August 29 2025 at 1 PM



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If suspicious, do not click links, open attachments, or provide credentials.

Good morning, I am available anytime today before 1400.

Curtis Markloff
Assistant Fire Marshal
Planning and Engineering Office
San Bernardino County Fire Protection District
909-918-2201



From: Paul Miller <pmiller@therchgroup.com>
Sent: Tuesday, August 26, 2025 7:22 PM
To: Markloff, Curtis <CMarkloff@SBCFire.org>; Allen, Jeffrey <JAllen@SBCFire.org>; Fleckenstein, Pat <PFleckenstein@SBCFire.org>
Cc: Collin Crawford <ccrawford@aspeneg.com>; Daniel Jones <Djones@therchgroup.com>; Brett Fooks <brett.fooks@energy.ca.gov>; Ronchetti, Monica <mronchetti@SBCFire.org>; Strong, Tom <TStrong@SBCFire.org>
Subject: RE: Soda Mountain Solar Project - Notice of Information and Environmental Scoping Meeting -- August 29 2025 at 1 PM

Good evening Curtis,

Thanks for responding to our recent email.

You are correct regarding preliminary status as this project goes through environmental review. Supervisor Brett Fooks of CEC would like to convene another meeting with you as soon as possible.
This would be to inform you of the CEC process and get as much feedback as possible. Your comments will be valuable going forward.

We can also make sure you have updated information on the project, as there have been some changes (perhaps you have the updates). We can try to meet any time before the presentation this Friday or early next week before the written comments are due. Tough timing with the Holiday weekend, but we are following an expedited process that has to keep moving.

If there are any times available for you – please let us know and we will try to accommodate.

Thanks,

Paul Miller
Managing Principal
pmiller@TheRCHGroup.com
(916) 212-9600 Cell
(916) 782-4427 (All RCH Staff)

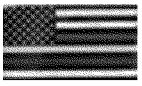
RCH GROUP
planning & environmental consulting

From: Markloff, Curtis <CMarkloff@SBCFire.org>
Sent: Tuesday, August 26, 2025 4:49 PM
To: Paul Miller <pmiller@therchgroup.com>; Allen, Jeffrey <JAllen@SBCFire.org>; Fleckenstein, Pat <PFleckenstein@SBCFire.org>
Cc: Collin Crawford <ccrawford@aspeneg.com>; Daniel Jones <Djones@therchgroup.com>; Brett Fooks <brett.fooks@energy.ca.gov>; Ronchetti, Monica <mronchetti@SBCFire.org>; Strong, Tom <TStrong@SBCFire.org>
Subject: RE: Soda Mountain Solar Project - Notice of Information and Environmental Scoping Meeting -- August 29 2025 at 1 PM

Good afternoon sir, nothing has been submitted to us by the applicant and everything I have seen so far seems preliminary so I wouldn't be positive on conditioning everything for this project such as fire protection, access roads, etc. We are currently in talks with a group that is going to assist us with creating an ordinance much like Fresno County completed for a fair share contribution for facilities such as this. I am sure you are aware that the location of this proposed facility is roughly 12 miles as the crow flies from our local station in Baker that has limited staffing and resources due to the area. Our next closest unit is roughly 62 miles away in the Community of Helendale that also has limited resources and staffing.

Please let me know if you need anything else.

Curtis Markloff
Assistant Fire Marshal
Planning and Engineering Office
San Bernardino County Fire Protection District
909-918-2201



From: Paul Miller <pmiller@therchgroup.com>
Sent: Friday, August 22, 2025 10:58 AM
To: Markloff, Curtis <CMarkloff@SBCFire.org>; Allen, Jeffrey <JAllen@SBCFire.org>; Fleckenstein, Pat <PFleckenstein@SBCFire.org>
Cc: Collin Crawford <ccrawford@aspeneg.com>; Daniel Jones <Djones@therchgroup.com>; Brett Fooks <brett.fooks@energy.ca.gov>
Subject: Soda Mountain Solar Project - Notice of Information and Environmental Scoping Meeting -- August 29 2025 at 1 PM

Assistant Fire Marshall Markloff, Captain Allen, and Engineer Fleckenstein,

Please be advised of the Soda Mtn Solar Project Scoping meeting scheduled next Friday.
All comments and recommendations by the SBCFD would be greatly appreciated, the CEC seeks your input

I expect there will be a 30-45 minute project introduction and then an opportunity for government agencies to comment
You should be able to comment within the first hour (either in-person or via the Zoom meeting)

Written comments can also be submitted, in addition to oral comments at the meeting.

Written comments may be submitted to the Docket Unit by 5:00 p.m. on September 3, 2025.
More details on the meeting and project are in the attached PDF file.

I have been updated on your emails and discussions with Collin Crawford and Dr. Greenberg related to fire protection socioeconomic impacts.

Dan Jones and I, supervised by Brett Fooks will be leading the impacts analysis in the upcoming CEC staff assessment for Worker Safety/ Fire Protection.
Hopefully we can set up a meeting(s) soon to further the discussions related to Fire Protection impacts of this project.

Through those meeting(s) we can also keep you updated on any questions you have related to the environmental staff assessment.
The Draft Staff Assessment is due to be published before the end of this year – so, the project is now on a very fast track.

Please reach out to me or Dan Jones if you have any questions, we will act as a point of contact to the CEC project team.

Notice of Information
and Environmental Scoping Meeting
for the Proposed Soda Mountain Solar Project
Hybrid Meeting In-Person and via Zoom
August 29, 2025
1:00 p.m. – 5:00 p.m.
In-person at:
Holiday Inn Express – Conference Room
2700 Lenwood Road
Barstow, CA 92311

Thanks,

Paul Miller
Managing Principal
pmiller@TheRCHGroup.com
(916) 212-9600 Cell
(916) 782-4427 (All RCH Staff)

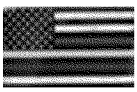
RCH GROUP
planning & environmental consulting

From: Markloff, Curtis [CMarkloff@SBCFire.org]
Sent: 8/27/2025 10:01:31 PM
To: Collin Crawford [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ebc874e994df437ba78978627476586f-c7d37eff-0f]; Paul Miller [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=4d4ce365f8bd442a8cb7d479381e2476-8906af8e-0e]; Allen, Jeffrey [JAllen@SBCFire.org]; Fleckenstein, Pat [PFleckenstein@SBCFire.org]; Serna, Martin [mserna@sbcfire.org]
CC: Daniel Jones [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=352cfed2f4d849749d3d8f98a9563279-082cef18-97]; Fooks, Brett@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=870df74143964b71ada0039bf13c5a9a-Fooks, Bret]; Ronchetti, Monica [mronchetti@SBCFire.org]; Strong, Tom [TStrong@SBCFire.org]; John Carrier [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d823054932c444d18fdb316ac77c6d07-b2cf4468-54]
Subject: RE: Soda Mountain Solar Project - Notice of Information and Environmental Scoping Meeting -- August 29 2025 at 1 PM

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Resending again without the attachments as it was too large to send outside the department. Sorry!

Curtis Markloff
Assistant Fire Marshal
Planning and Engineering Office
San Bernardino County Fire Protection District
909-918-2201



From: Markloff, Curtis
Sent: Wednesday, August 27, 2025 2:32 PM
To: 'Collin Crawford' <CCrawford@aspeneg.com>; Paul Miller <pmiller@therchgroup.com>; Allen, Jeffrey <JAllen@SBCFire.org>; Fleckenstein, Pat <PFleckenstein@SBCFire.org>; Serna, Martin <mserna@SBCFire.org>
Cc: Daniel Jones <Djones@therchgroup.com>; Brett Fooks <brett.fooks@energy.ca.gov>; Ronchetti, Monica <mronchetti@SBCFire.org>; Strong, Tom <TStrong@SBCFire.org>; John Carrier <jcarrier@aspeneg.com>
Subject: RE: Soda Mountain Solar Project - Notice of Information and Environmental Scoping Meeting -- August 29 2025 at 1 PM

Collin, thank you for the updated information.

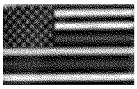
I have spoken with Assistant Chief of Operations Martin Serna and Battalion Chief Jeff Allen about the meeting on Friday and the concerns we need to address during the public comment period such as the impacts this project will have on the department and our lack of resources to respond to an emergency at this facility due to the location and project type.

Chief Serna and Chief Allen, please see the attached updated project description (Updated Project Description)
Worker safety plan (Appendix Q)
30% plans construction plans (Appendix A3 Engineering)
Meeting information (Notice of Information)
My email to Collin Crawford with Aspen Environmental outlining some of my concerns over the design process (RE: Soda Mountain Solar Facility)

Meeting link - https://energy.zoom.us/j/81021544506?pwd=16pHGtOBBimK7AICobIHb1wtGWfQJW.1

If you need anything else, please let me know

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Assistant Fire Marshal
Planning and Engineering Office
San Bernardino County Fire Protection District
909-918-2201



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Sent: Wednesday, August 27, 2025 1:58 PM
To: Markloff, Curtis <CMarkloff@SBCFire.org>; Paul Miller <pmiller@therchgroup.com>; Allen, Jeffrey <JAllen@SBCFire.org>; Fleckenstein, Pat <PFleckenstein@SBCFire.org>
Cc: Daniel Jones <Djones@therchgroup.com>; Brett Fooks <brett.fooks@energy.ca.gov>; Ronchetti, Monica <mronchetti@SBCFire.org>; Strong, Tom <TStrong@SBCFire.org>; John Carrier <jcarrier@aspeneg.com>
Subject: RE: Soda Mountain Solar Project - Notice of Information and Environmental Scoping Meeting -- August 29 2025 at 1 PM

Hi Curtis,

Again, thank you for taking the time to talk with us today. I'm attaching some of the updated information that the applicant has uploaded onto the project's docket.

Here's the link for the docket:
https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=24-OPT-03

As soon as we get the updated site plans, we'll send them your way.

If you have any questions, please feel free to reach out to Paul or myself. Have a great rest of your week and we'll hopefully see you on Friday!

Best,

Collin Crawford-Martin
Environmental Scientist
Aspen Environmental Group
(916) 379-0357

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RCHGROUP
planning & environmental consulting

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Cc: Collin Crawford <ccrawford@aspeneg.com>; Daniel Jones <Djones@therchgroup.com>; Brett Fooks <brett.fooks@energy.ca.gov>
Subject: Soda Mountain Solar Project - Notice of Information and Environmental Scoping Meeting -- August 29 2025 at 1 PM

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All comments and recommendations by the SBCFD would be greatly appreciated, the CEC seeks your input

I expect there will be a 30-45 minute project introduction and then an opportunity for government agencies to comment
You should be able to comment within the first hour (either in-person or via the Zoom meeting)

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Please reach out to me or Dan Jones if you have any questions, we will act as a point of contact to the CEC project team.

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and Environmental Scoping Meeting
for the Proposed Soda Mountain Solar Project
Hybrid Meeting In-Person and via Zoom
August 29, 2025
1:00 p.m. – 5:00 p.m.
In-person at:
Holiday Inn Express – Conference Room
2700 Lenwood Road
Barstow, CA 92311

Thanks,

Paul Miller
Managing Principal
pmiller@TheRCHGroup.com
(916) 212-9600 Cell
(916) 782-4427 (All RCH Staff)

RCHGROUP
planning & environmental consulting

From: Paul Miller [pmiller@therchgroup.com]
Sent: 8/27/2025 6:16:16 PM
To: Markloff, Curtis [cmarkloff@sbcfire.org]; Fooks, Brett@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=870df74143964b71ada0039bf13c5a9a-Fooks, Bret]
CC: Collin Crawford [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ebc874e994df437ba78978627476586f-c7d37eff-0f]

Subject: CEC Soda Mountain Solar Project
Location: Microsoft Teams Meeting

Start: 8/27/2025 8:00:00 PM
End: 8/27/2025 8:30:00 PM
Show Time As: Tentative

Recurrence: (none)

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Microsoft Teams Need help?

Join the meeting now

Meeting ID: 299 743 640 877 0

Passcode: cd2nu2XJ

Dial in by phone

+1 929-346-6942,,220220617# United States, New York City

Find a local number

Phone conference ID: 220 220 617#

For organizers: Meeting options | Reset dial-in PIN

From: Patrovsky, Joan E [jpatrovs@blm.gov]
Sent: 8/13/2025 12:13:35 AM
To: Worrall, Lisa@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4bbc7048b38485084bdb03fb494b25b-Worrall, Li]
CC: Cordes, Isabeau J [icordes@blm.gov]; Campbell, Joella R [joellacampbell@blm.gov]; Stamer, Marc R [mstamer@blm.gov]; Donnell, Julie A [jdonnell@blm.gov]; Black, Devin@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c6ec9f417a6e448aae52465b9f719b5d-ea9475b4-16]; Cabrera, Crystal@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ed6e32a127144ccfa19a6f4347765a9e-00a33618-ff]; Ponce, Mariah@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=bc5faa5d564c4cf3a2f49468b736b6c2-b2346f64-e7]
Subject: Soda Mountain Solar - BLM Receipt of August 2025 Plan of Development and Appendices

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hello Lisa,

The Bureau of Land Management (BLM) has received an updated Plan of Development (POD), including appendices, from the holder, Soda Mountain Solar LLC. These documents : which are all available at this link..

Our team has not yet begun its review, but we anticipate starting in the coming weeks.

We have our BLM–CEC joint call scheduled for August 27, and BLM would like to hear from CEC regarding the contents of the updated POD. We want to ensure that all parties are aligned on the proposed action and alternatives. In addition, we wish hear any updates CEC may have since deeming the Opt-In application complete.

We look forward to our continuing coordination.

Joan Patrovsky, PMP
Project Manager
U.S. Department of the Interior - Region 8 and 10
Bureau of Land Management
California Desert District Office

"What you do today can improve all your tomorrows."- Ralph Marston

CONFIDENTIALITY NOTICE: This message including any attachments is intended exclusively for the individual(s) or entity to which it is addressed. This communication may contain information which is proprietary, privileged, confidential, or otherwise legally exempt from disclosure. If you are not the named addressee, you are not authorized to read, print, retain, copy or disseminate this message or any part of it without the express authorization from the author.

From: Patrovsky, Joan E [jpatrovs@blm.gov]
Sent: 8/28/2025 7:55:50 PM
To: Patrovsky, Joan E [jpatrovs@blm.gov]; Stamer, Marc R [mstamer@blm.gov]; Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]; Knight, Eric@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=be42548337f44852a291a9845f226f62-Knight, Eri]; Worrall, Lisa@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4bbc7048b38485084bdb03fb494b25b-Worrall, Li]
Subject: BLM & CEC - DOI process Solar projects
Location: Microsoft Teams Meeting
Start: 9/4/2025 9:00:00 PM
End: 9/4/2025 9:30:00 PM
Show Time As: Busy
Recurrence: (none)

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Interagency management discussion relative to US Departmental Interior Memorandum and Executive Orders; Soda Mountain Solar amendment application status.

Microsoft Teams Need help?

Join the meeting now

Meeting ID: 271 922 988 167 7

Passcode: Z36MQ7Gf

For organizers: Meeting options

From: Hannah Arkin [hannah@resolutionenvironmental.com]
Sent: 8/25/2025 4:59:18 PM
To: Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]
CC: Worrall, Lisa@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4bbc7048b38485084bdb03fb494b25b-Worrall, Li]; Bohan, Drew@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7dd07a25fcbc49b0bbb219cc3b788983-Bohan, Drew]
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/29)
Attachments: Project Data.kmz

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Kaycee,

Thank you for this email. Attached to this email is a site plan overlaid on a google earth layer, which will help guide your team during the Soda Mt. site visit on Friday morning.

If there is an option for the Applicant team to attend the site meeting with the CEC team, we would appreciate that opportunity. We can make ourselves available at any time to assist. The sun rises around 6:15am in the Baker area.

Best,
Hannah

Hannah Arkin

CEO

Resolution Environmental

262 B Avenue, Coronado, CA 92118

760-504-4109

From: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Sent: Monday, August 18, 2025 3:16 PM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/29)

Hi Hannah,

Respectfully, if we wanted to conduct the site visit ourselves on 8/29, would that be possible? Is there a specific site map/route you suggest?
We are working on our travel arrangements and think this would allow us to be a bit more flexible with our timing.

Many thanks,

Kaycee

Kaycee Chang (she, her, hers)
Supervisor
Siting, Transmission, and Environmental Protection Division
Book time to meet with me

From: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Sent: Monday, August 11, 2025 11:52 AM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; Jackson-Ross, Lyndsay@Energy <Lyndsay.Jackson-Ross@Energy.ca.gov>; Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Rodriguez, Sally@Energy <Sally.Rodriguez@energy.ca.gov>; Lukanich, Kimberly@Energy <Kimberly.Lukanich@Energy.ca.gov>; House, Rosemary@Energy <Rosemary.House@Energy.ca.gov>; Sandoval-Moreno, Victoria@Energy <Victoria.Sandoval-Moreno@energy.ca.gov>
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/29)

Hello Hannah,

We'd like to have the site visit on 8/29, from 9am-11am, please. We will meet you at the location you provided and will look forward to the site map.

Potential attendees from our side include:

- Commissioner Gallardo
- Jimmy Qaqundah, her advisor
- Chair Hochschild
- Robert Chun, his advisor
- Drew Bohan, our Executive Director
- Dian Vorters, Siting deputy director
- Eric Knight, Siting and Environmental branch manager
- Kaycee Chang (myself, CEQA project management supervisor)
- Bio staff TBD

I will also confirm the attendee list closer to the date.
I included the Chair and Robert's scheduler in this email as well, along with Kimberly and Sally to support Drew's calendar/travel.

We are still waiting to confirm the 3pm meeting venue, but it is likely Holiday Inn Express (2709 Lenwood Road, Barstow, CA 92311). If we can all stay there, our days would likely look like this:
Thursday, 8/28

- Everyone arrives to Barstow, CA - stays at Holiday Inn Express or nearby

Friday 8/29

- Leave hotel in Barstow, drive to Baker
- 9am: meet Hannah Arkin and team at 66150 Rasor Road, Baker CA 92309 (Shell Gas Station parking lot)
- 11am: conclude site visit
- Drive back to hotel in Barstow, lunch, freshen up, etc.
- 1pm: arrive to the conference room ~2 hrs early to finish set up and get situated
- 3pm-7pm: hybrid info/scoping meeting

Information from Hannah Arkin:

1. **Site Visit Time**: 9am-11am
2. **Location**: Meet at 66150 Rasor Road, Baker CA 92309. This is the Shell Gas Station parking lot, which is the closest public location to the project site. Hannah will provide a site map as we get closer to the date, identifying the tour route.
3. **Contact:** Hannah Arkin, 760-504-4109, hannah@resolutionenvironmental.com

Thank you very much, everyone!
Kaycee

Kaycee Chang (she, her, hers)
Supervisor
Siting, Transmission, and Environmental Protection Division

Book time to meet with me

From: Hannah Arkin <hannah@resolutionenvironmental.com>
Sent: Wednesday, July 30, 2025 1:06 PM
To: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; House, Rosemary@Energy <Rosemary.House@Energy.ca.gov>; Sandoval-Moreno, Victoria@Energy <Victoria.Sandoval-Moreno@energy.ca.gov>
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/28 or 8/29)

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Kaycee,

Thank you for your email. We would be delighted to host a site visit on 8/28 or 8/29.

If we host the visit before the scoping meeting on 8/29, I would suggest the following:

1. **Time**: 9am-11am
2. **Location**: Meet at 66150 Rasor Road, Baker CA 92309. This is the Shell Gas Station parking lot, which is the closest public location to our project site. Alternatively, I am happy to arrange carpools from any Barstow hotel to the project site. I will provide a site map as we get closer to the date, identifying the tour route.
3. **Contact:** Hannah Arkin, 760-504-4109, hannah@resolutionenvironmental.com

Given the remote nature of the site and associated travel times, your team may want to consider having the site tour on 8/28. We are able to make either day work. Please just let us know what works best for your side.

Thank you!
Hannah

Hannah Arkin
CEO
Resolution Environmental

262 B Avenue, Coronado, CA 92118
760-504-4109

From: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Sent: Tuesday, July 29, 2025 6:02 PM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; House, Rosemary@Energy <Rosemary.House@Energy.ca.gov>; Sandoval-Moreno, Victoria@Energy <Victoria.Sandoval-Moreno@energy.ca.gov>
Subject: Site Visit Request for Soda Mountain Solar Project (8/28 or 8/29)

Hi Hannah,

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I believe you and Lisa have discussed this, but we wanted to put the ask in an email and loop in the Chair and Commissioner's schedulers/travel coordinators: In addition to the meeting, **can we request a site visit before the meeting, either the afternoon of 8/28 or the morning of 8/29?**

Commissioner Gallardo and our Executive Director, Drew Bohan, would be in attendance, along with potentially staff from our Siting Division. Rosemary House is in charge of Commissioner Gallardo's calendar and Victoria Sandoval-Moreno is in charge of Drew's.

If the morning of 8/29 works best, we would probably want to get back to the venue 2-3 hours before the meeting, so around 12-1pm.

At minimum, the following information would be helpful for the site visit:

1. Time
2. Location - specific information on where to meet, and maybe a map, would be helpful
3. Contact name, email, and phone number for day of coordination and for emergencies

Thank you very much!
Kaycee

Kaycee Chang (she, her, hers)
Supervisor
CEQA Project Management
Siting and Environmental Branch
Siting, Transmission, and Environmental Protection Division
Work: 1-916-232-6319
Cell: 1-916-208-6545

California Energy Commission
Website: www.energy.ca.gov





Book time to meet with me

From: Chang, Kaycee@Energy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DD3D2FC8670840BDA4ACDC455903E787-CHANG, KAYC]
Sent: 8/25/2025 6:46:28 PM
To: Hannah Arkin [hannah@resolutionenvironmental.com]
CC: Worrall, Lisa@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4bbc7048b38485084bdb03fb494b25b-Worrall, Li]; Knight, Eric@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=be42548337f44852a291a9845f226f62-Knight, Eri]
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/29)
Attachments: Project Data.kmz

Hello Hannah, (*moving Drew to bcc since I'm asking about logistics)*

Thank you for the site plan, and for your previous email concerning the site hazards and safety concerns.

Apologies for the back-and-forth, but can we please take you up on your offer to conduct the site visit together with you and the applicant team, on 8/29? If so, would your team be able to provide the safey announcement/training and does that negate the need for us to provide a Safety Plan?

I also have the following questions:

1. Can we conduct the site visit earlier, potentially 6:30-8:30 am, leaving the Barstow Holiday Inn Express around 5:30am? Or do you recommend earlier due to the heat?
2. For our vehicle, do you recommend us having a 4 wheel drive or all wheel drive, or is that not necessary?
3. Do you have specific recommendations on attire, other than closed-toed shoes and long pants?
4. Do you have a list of other safety- or site visit-related items you recommend?

Updated list of potential CEC attendees:

- Commissioner Gallardo
- Jimmy Qaqundah, Commissioner's advisor
- Chair Hochschild
- Caroline Grey, Chair's advisor
- Drew Bohan, our Executive Director
- Sean Simon, Siting director
- Dian Vorters, Siting deputy director
- Eric Knight, Siting and Environmental branch manager
- Kaycee Chang (myself, CEQA project management supervisor)

We will keep with these details you provided:

1. Location: Meet at 66150 Rasor Road, Baker CA 92309. This is the Shell Gas Station parking lot, which is the closest public location to the project site.
2. Contact: Hannah Arkin, 760-504-4109, hannah@resolutionenvironmental.com

Thank you so much,
Kaycee

Kaycee Chang (she, her, hers)

Supervisor
Siting, Transmission, and Environmental Protection Division
Book time to meet with me

From: Hannah Arkin <hannah@resolutionenvironmental.com>
Sent: Monday, August 25, 2025 9:59 AM
To: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; Bohan, Drew@Energy <Drew.Bohan@energy.ca.gov>
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/29)

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Kaycee,

Thank you for this email. Attached to this email is a site plan overlaid on a google earth layer, which will help guide your team during the Soda Mt. site visit on Friday morning.

If there is an option for the Applicant team to attend the site meeting with the CEC team, we would appreciate that opportunity. We can make ourselves available at any time to assist. The sun rises around 6:15am in the Baker area.

Best,
Hannah

Hannah Arkin

CEO

Resolution Environmental

262 B Avenue, Coronado, CA 92118

760-504-4109

From: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Sent: Monday, August 18, 2025 3:16 PM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/29)

Hi Hannah,

Respectfully, if we wanted to conduct the site visit ourselves on 8/29, would that be possible? Is there a specific site map/route you suggest?
We are working on our travel arrangements and think this would allow us to be a bit more flexible with our timing.

Many thanks,
Kaycee

Kaycee Chang (she, her, hers)
Supervisor
Siting, Transmission, and Environmental Protection Division
Book time to meet with me

From: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Sent: Monday, August 11, 2025 11:52 AM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; Jackson-Ross, Lyndsay@Energy <Lyndsay.Jackson-Ross@Energy.ca.gov>; Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Rodriguez, Sally@Energy <Sally.Rodriguez@energy.ca.gov>; Lukanich, Kimberly@Energy <Kimberly.Lukanich@Energy.ca.gov>; House, Rosemary@Energy <Rosemary.House@Energy.ca.gov>; Sandoval-Moreno, Victoria@Energy <Victoria.Sandoval-Moreno@energy.ca.gov>
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/29)

Hello Hannah,

We'd like to have the site visit on 8/29, from 9am-11am, please. We will meet you at the location you provided and will look forward to the site map.

Potential attendees from our side include:

- Commissioner Gallardo
- Jimmy Qaqundah, her advisor
- Chair Hochschild
- Robert Chun, his advisor
- Drew Bohan, our Executive Director
- Dian Vorters, Siting deputy director
- Eric Knight, Siting and Environmental branch manager
- Kaycee Chang (myself, CEQA project management supervisor)
- Bio staff TBD

I will also confirm the attendee list closer to the date.
I included the Chair and Robert's scheduler in this email as well, along with Kimberly and Sally to support Drew's calendar/travel.

We are still waiting to confirm the 3pm meeting venue, but it is likely Holiday Inn Express (2709 Lenwood Road, Barstow, CA 92311). If we can all stay there, our days would likely look like this:
Thursday, 8/28

- Everyone arrives to Barstow, CA - stays at Holiday Inn Express or nearby

Friday 8/29

- Leave hotel in Barstow, drive to Baker
- 9am: meet Hannah Arkin and team at 66150 Rasor Road, Baker CA 92309 (Shell Gas Station parking lot)
- 11am: conclude site visit
- Drive back to hotel in Barstow, lunch, freshen up, etc.
- 1pm: arrive to the conference room ~2 hrs early to finish set up and get situated

- 3pm-7pm: hybrid info/scoping meeting

Information from Hannah Arkin:

1. **Site Visit Time**: 9am-11am
2. **Location**: Meet at 66150 Rasor Road, Baker CA 92309. This is the Shell Gas Station parking lot, which is the closest public location to the project site. Hannah will provide a site map as we get closer to the date, identifying the tour route.
3. **Contact:** Hannah Arkin, 760-504-4109, hannah@resolutionenvironmental.com

Thank you very much, everyone!
Kaycee

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Siting, Transmission, and Environmental Protection Division
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Thank you!
Hannah

Hannah Arkin
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Resolution Environmental
262 B Avenue, Coronado, CA 92118
760-504-4109

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Sent: Tuesday, July 29, 2025 6:02 PM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; House, Rosemary@Energy <Rosemary.House@Energy.ca.gov>; Sandoval-Moreno, Victoria@Energy <Victoria.Sandoval-Moreno@energy.ca.gov>
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Thank you very much!
Kaycee

Kaycee Chang (she, her, hers)
Supervisor
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Siting, Transmission, and Environmental Protection Division

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Cell: 1-916-208-6545

California Energy Commission
Website: www.energy.ca.gov

Book time to meet with me

From: Hannah Arkin [hannah@resolutionenvironmental.com]
Sent: 7/24/2025 9:17:58 PM
To: Worrall, Lisa@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4bbc7048b38485084bdb03fb494b25b-Worrall, Li]; Knight, Eric@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=be42548337f44852a291a9845f226f62-Knight, Eri]; Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]
Subject: Fw: Soda Mt Meeting 3/20/2024
Attachments: 2024-03-19_SodaMtn_Data Request_1c.pdf

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Lisa,

In preparation for our met today, I wanted to pass the correspondence below along, which shows CDFW previously approved the SWCA jurisdictional delineation for the project. This was the first jurisdictional delineation we submitted to CEC.

Hannah Arkin
CEO
Resolution Environmental
262 B Avenue, Coronado, CA 92118
760-504-4109

From: Rodriguez, Magdalena@Wildlife <Magdalena.Rodriguez@wildlife.ca.gov>
Sent: Wednesday, March 20, 2024 8:40:16 AM
To: Kara Laurenson-Wright <Kara.LaurensonWright@swca.com>; Ellsworth, Alisa@Wildlife <Alisa.Ellsworth@wildlife.ca.gov>
Cc: Dustin Thaler <dut@vcrenewables.com>; hannahgbeh <hannahgbeh@gmail.com>; Ziad Alaywan <ziad@zglobal.biz>; Sarah Kaaki <skaaki@zglobal.biz>; Branch, Alexander(Harllee)@Wildlife <Alexander.Branch@Wildlife.ca.gov>; Grunbaum, Lucas <lucasgrunbaum@paulhastings.com>
Subject: RE: Soda Mt Meeting 3/20/2024

Kara,

We reviewed the Aquatics delineation. We felt the delineation was well done overall and only have some small comments/edits. They are attached in the DR 1c. I wanted to get this out prior to the meeting.

Magdalena

From: Kara Laurenson-Wright <Kara.LaurensonWright@swca.com>
Sent: Tuesday, March 19, 2024 6:50 PM
To: Rodriguez, Magdalena@Wildlife <Magdalena.Rodriguez@wildlife.ca.gov>; Ellsworth, Alisa@Wildlife <Alisa.Ellsworth@wildlife.ca.gov>
Cc: Dustin Thaler <dut@vcrenewables.com>; hannahgbeh <hannahgbeh@gmail.com>; Ziad Alaywan <ziad@zglobal.biz>;

Sarah Kaaki <skaaki@zglobal.biz>; Branch, Alexander(Harllee)@Wildlife <Alexander.Branch@Wildlife.ca.gov>; Grunbaum, Lucas <lucasgrunbaum@paulhastings.com>
Subject: Soda Mt Meeting 3/20/2024

Some people who received this message don't often get email from kara.laurensonwright@swca.com. Learn why this is important

WARNING: This message is from an external source. Verify the sender and exercise caution when clicking links or opening attachments.

Hello Soda Mt team,

Attached is our draft agenda for tomorrow's 10am meeting.

Best,

Kara Laurenson-Wright, AICP

CEQA/NEPA Project Manager

SWCA Environmental Consultants

Cell 415.599.6464

kara.laurensonwright@swca.com



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State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Inland Deserts Region
3602 Inland Empire Boulevard, Suite C-220
Ontario, CA 91764
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

MEMORANDUM

To:	Kara Laurenson-Wright, SWCA
From:	Magdalena Rodriguez, California Department of Fish and Wildlife (CDFW)
Subject:	Soda Mountain Solar Project –Technical Study Review – Data Request 1c
Date:	March 19, 2024
cc:	Alisa Ellsworth, CDFW
	Dr. Shankar Sharma, CDFW
	Sarah Lozano, Dudek
Attachment A:	Aquatic Resource Delineation Report

The California Department of Fish and Wildlife (CDFW), with technical assistance from Dudek, has reviewed the first round of technical reports, as well as the draft Project Description prepared by SWCA Environmental Consultants (SWCA) on behalf of Soda Mountain, LLC. The attached data request matrix is a compilation of DR 1c requests. Attachment A is a tracking tool for all data requests and will track how items were responded to by SWCA.

At any point during the CEQA process, CDFW reserves the right to ask for additional information. If you have any questions regarding the information in this memo, please contact me at 909-844-2520 or magdalena.rodriguez@wildlife.ca.gov.

Attachment A

Aquatic Resources Delineation Report

Item	Report Section No./Title/Figures	Aquatic Resources Delineation DR 1c March 2024	SWCA Response to DR 1c	DR 1c Resolved? YES/ PARTIAL/NO	DR 2c, if needed	SWCA Response to DR 2c
1.	Executive Summary	- The listed acreage for the project site is 2,664 acres, which differs from the acreage stated in the BRTR. According to the BRTR, the project site spans 2,670 acres.				
2.	1.2.1 Location	- The listed acreage for the project site is 2,664 acres, which differs from the acreage stated in the BRTR. According to the BRTR, the project site spans 2,670 acres.				
3.	1.4.5 Vegetation Communities	- "Cheesebush (Sweetbush Scrub)" is listed, but the BRTR refers to it as "Cheesebush-Sweetbush Scrub (Ambrosia Salsola- Bebbia juncea shrubland alliance)." The inclusion of "Bebbia" as an indicator is not accurate and should be revised for consistency.				
4.	2 Methods	- The methods are well-described and seem robust; however, a primarily model-based approach was favored over a primarily field-based delineation. Enhancing Section 2.3.2.2 (model refinement) with additional details on how field assessments were incorporated to revise and finalize the results could strengthen the understanding that this process isn't solely model-driven but was verified by field delineators.				
5.	3.1.2 Transect Surveys	- The acreage listed for the project site is 2,382 acres, which contrasts with the previously stated 2,664-acre project site. This reduction raises the question of why the acreage has decreased. According to the BRTR, the project site spans 2,670 acres.				
6.	Figure 26. Aquatic resources inventory map	- Figure 26 displays all non-wetland waters. Please remove the "(Non-prominent)" label from the legend.				
7.	Appendix C	- The maps in Appendix C depict all features, yet the legend erroneously includes the term "non-prominent." Please revise the legend to exclude this term.				
8.	3.3 Potentially Jurisdictional Aquatic Resources	- The acreages and linear feet provided in the table and described in the text pertain to the "review area." It would be beneficial to also include the acreage and linear feet specifically for features within the Project site.				

From: Chang, Kaycee@Energy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DD3D2FC8670840BDA4ACDC455903E787-CHANG, KAYC]
Sent: 7/30/2025 1:02:06 AM
To: Hannah Gbeh [hannah@resolutionenvironmental.com]
CC: Worrall, Lisa@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4bbc7048b38485084bdb03fb494b25b-Worrall, Li]; House, Rosemary@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3fd09f7d0d9e4bc69746863233e8ffdf-3929d70b-14]; Sandoval-Moreno, Victoria@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c435065cd74a4e2a8162523065d8b11a-Sandoval-Mo]
Subject: Site Visit Request for Soda Mountain Solar Project (8/28 or 8/29)

Hi Hannah,

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Thank you very much!
Kaycee

Kaycee Chang (she, her, hers)
Supervisor
CEQA Project Management
Siting and Environmental Branch
Siting, Transmission, and Environmental Protection Division
Work: 1-916-232-6319
Cell: 1-916-208-6545

California Energy Commission
Website: www.energy.ca.gov





Book time to meet with me

From: Worrall, Lisa@Energy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E4BBC7048B38485084BDB03FB494B25B-WORRALL, LI]
Sent: 8/14/2025 12:19:50 AM
To: Hannah Arkin [hannah@resolutionenvironmental.com]
CC: Negar Vahidi [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=cb23cc0e70ac4e44ab61714491954981-4e241c75-c7]; Tatiana Inouye [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d127e0699c844e88806bedbc7a2b371d-12c63cc3-33]; Knight, Eric@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=be42548337f44852a291a9845f226f62-Knight, Eri]; Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]
Subject: Soda Mountain - school impact fees

Hi Hannah,

Our staff would like to know why it says in Appendix P that the applicant would pay a school impact fee. This is in Appendix P in 2.3.7 (Public Schools) and the information is in Table 4 in that same section. School impact fees are levied by local jurisdictions so as the project is on BLM land, this fee would not be assessed.

Thanks,

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

715 P Street, MS-40, Sacramento, CA 95814
1-916-661-8367

California Energy Commission
Website: www.energy.ca.gov

From: Hannah Arkin [hannah@resolutionenvironmental.com]
Sent: 8/14/2025 1:57:54 PM
To: Worrall, Lisa@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4bbc7048b38485084bdb03fb494b25b-Worrall, Li]
CC: Negar Vahidi [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=cb23cc0e70ac4e44ab61714491954981-4e241c75-c7]; Tatiana Inouye [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d127e0699c844e88806bedbc7a2b371d-12c63cc3-33]; Knight, Eric@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=be42548337f44852a291a9845f226f62-Knight, Eri]; Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]
Subject: Re: Soda Mountain - school impact fees

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Lisa,

I am checking with our consultant team and will get you an answer for this ASAP.

Thank you!
Hannah

Hannah Arkin
CEO
Resolution Environmental
262 B Avenue, Coronado, CA 92118
760-504-4109

From: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Sent: Wednesday, August 13, 2025 5:20 PM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Negar Vahidi <nvahidi@aspeneg.com>; Tatiana Inouye <tinouye@aspeneg.com>; Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Soda Mountain - school impact fees

Hi Hannah,

Our staff would like to know why it says in Appendix P that the applicant would pay a school impact fee. This is in Appendix P in 2.3.7 (Public Schools) and the information is in Table 4 in that same section. School impact fees are levied by local jurisdictions so as the project is on BLM land, this fee would not be assessed.

Thanks,

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

715 P Street, MS-40, Sacramento, CA 95814

1-916-661-8367

California Energy Commission
Website: www.energy.ca.gov



From: Hannah Arkin [hannah@resolutionenvironmental.com]
Sent: 8/15/2025 4:07:18 PM
To: Worrall, Lisa@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4bbc7048b38485084bdb03fb494b25b-Worrall, Li]
CC: Negar Vahidi [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=cb23cc0e70ac4e44ab61714491954981-4e241c75-c7]; Tatiana Inouye [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d127e0699c844e88806bedbc7a2b371d-12c63cc3-33]; Knight, Eric@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=be42548337f44852a291a9845f226f62-Knight, Eri]; Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]
Subject: Re: Soda Mountain - school impact fees

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Lisa,

My consultant team responded to your question below regarding Appendix P.

The section on school impact fees was added to the report in response to CEC's checklist item 7. (B) (vi): "an estimate of applicable school impact fees." In the section just before the school impact fees in section 3.3.8 is a discussion on the County's Public Services Impact Fee. They state that because SMS is an "opt-in project" it is not subject to the fee. The discussion goes further to state that the unpaid annual Public Services Impact Fee total amounts to a "disbenefit" of the project that is subtracted from the project's economic benefits. This is done in Section 4.1.1 Summary of Findings -- Net Fiscal Benefits of the Project.

The one-time school impact fee could be treated in the same manner if it turns out it is not collected by the Baker School District the amount is relatively small at $1, 390 compared to the net benefit of $8,855,998 (which includes subtracting the disbenefit). They have spent a fair amount of time trying to find a definitive answer to whether the school fee is collectable and have not found anything that precludes payment of the fee. It may be a subject of an agreement between the BLM, the developer, and the County/school district.

If the CEC has a source that determines a school fee is not assessed on BLM land, we can definitely update the report to remove this item. Please let me know your preference and if you have any additional questions.

Thank you!
Hannah

Hannah Arkin
CEO
Resolution Environmental
262 B Avenue, Coronado, CA 92118

760-504-4109

From: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Sent: Wednesday, August 13, 2025 5:19 PM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Negar Vahidi <nvahidi@aspeneg.com>; Tatiana Inouye <tinouye@aspeneg.com>; Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Soda Mountain - school impact fees

Hi Hannah,

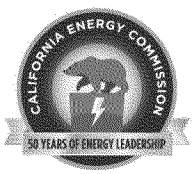
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Thanks,

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

715 P Street, MS-40, Sacramento, CA 95814
1-916-661-8367

California Energy Commission
Website: www.energy.ca.gov



From: Hannah Arkin [hannah@resolutionenvironmental.com]
Sent: 8/26/2025 4:13:18 PM
To: Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]
CC: Worrall, Lisa@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4bbc7048b38485084bdb03fb494b25b-Worrall, Li]; Knight, Eric@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=be42548337f44852a291a9845f226f62-Knight, Eri]
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/29)

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Hi Kaycee,

Yes, we would be delighted to tour with your team on Friday. Please see my responses below, in red.

We are looking forward to seeing everyone on Friday! If you need anything else in the interim, please don't hesitate to reach out.

Best,
Hannah

Hannah Arkin

CEO

Resolution Environmental

262 B Avenue, Coronado, CA 92118

760-504-4109

From: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Sent: Monday, August 25, 2025 11:46 AM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; Knight, Eric@Energy <Eric.Knight@energy.ca.gov>
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/29)

Hello Hannah, (*moving Drew to bcc since I'm asking about logistics)*

Thank you for the site plan, and for your previous email concerning the site hazards and safety concerns.

Apologies for the back-and-forth, but can we please take you up on your offer to conduct the site visit together with you and the applicant team, on 8/29? If so, would your team be able to provide the safety announcement/training and does that negate the need for us to provide a Safety Plan? Yes, we can absolutely provide the safety announcement/training.

I also have the following questions:

1. Can we conduct the site visit earlier, potentially 6:30-8:30 am, leaving the Barstow Holiday Inn Express around 5:30am? Or do you recommend earlier due to the heat? A 6:30-8:30 tour with a hotel departure time of 5:30am is the perfect time slot.
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4. Do you have a list of other safety- or site visit-related items you recommend? Water, sunscreen and bug spray are a good idea for your team to have. Our team will make sure to have water also available.

Updated list of potential CEC attendees:

- Commissioner Gallardo
- Jimmy Qaqundah, Commissioner's advisor
- Chair Hochschild
- Caroline Grey, Chair's advisor
- Drew Bohan, our Executive Director
- Sean Simon, Siting director
- Dian Vorters, Siting deputy director
- Eric Knight, Siting and Environmental branch manager
- Kaycee Chang (myself, CEQA project management supervisor)

We will keep with these details you provided:

1. Location: Meet at 66150 Rasor Road, Baker CA 92309. This is the Shell Gas Station parking lot, which is the closest public location to the project site.
2. Contact: Hannah Arkin, 760-504-4109, hannah@resolutionenvironmental.com

Thank you so much,
Kaycee

Kaycee Chang (she, her, hers)
Supervisor
Siting, Transmission, and Environmental Protection Division
Book time to meet with me

From: Hannah Arkin <hannah@resolutionenvironmental.com>
Sent: Monday, August 25, 2025 9:59 AM
To: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; Bohan, Drew@Energy <Drew.Bohan@energy.ca.gov>
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/29)

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Hi Kaycee,

Thank you for this email. Attached to this email is a site plan overlaid on a google earth layer, which will help guide your team during the Soda Mt. site visit on Friday morning.

If there is an option for the Applicant team to attend the site meeting with the CEC team, we would appreciate that opportunity. We can make ourselves available at any time to assist. The sun rises around 6:15am in the Baker area.

Best,
Hannah

Hannah Arkin

CEO

Resolution Environmental

262 B Avenue, Coronado, CA 92118

760-504-4109

From: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Sent: Monday, August 18, 2025 3:16 PM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/29)

Hi Hannah,

Respectfully, if we wanted to conduct the site visit ourselves on 8/29, would that be possible? Is there a specific site map/route you suggest?
We are working on our travel arrangements and think this would allow us to be a bit more flexible with our timing.

Many thanks,
Kaycee

Kaycee Chang (she, her, hers)
Supervisor
Siting, Transmission, and Environmental Protection Division



Book time to meet with me

From: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Sent: Monday, August 11, 2025 11:52 AM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; Jackson-Ross, Lyndsay@Energy <Lyndsay.Jackson-Ross@Energy.ca.gov>; Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Rodriguez, Sally@Energy <Sally.Rodriguez@energy.ca.gov>; Lukanich, Kimberly@Energy <Kimberly.Lukanich@Energy.ca.gov>; House, Rosemary@Energy <Rosemary.House@Energy.ca.gov>; Sandoval-Moreno, Victoria@Energy <Victoria.Sandoval-Moreno@energy.ca.gov>
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/29)

Hello Hannah,

We'd like to have the site visit on 8/29, from 9am-11am, please. We will meet you at the location you provided and will look forward to the site map.

Potential attendees from our side include:

- Commissioner Gallardo
- Jimmy Qaqundah, her advisor
- Chair Hochschild
- Robert Chun, his advisor
- Drew Bohan, our Executive Director
- Dian Vorters, Siting deputy director
- Eric Knight, Siting and Environmental branch manager
- Kaycee Chang (myself, CEQA project management supervisor)
- Bio staff TBD

I will also confirm the attendee list closer to the date.
I included the Chair and Robert's scheduler in this email as well, along with Kimberly and Sally to support Drew's calendar/travel.

We are still waiting to confirm the 3pm meeting venue, but it is likely Holiday Inn Express (2709 Lenwood Road, Barstow, CA 92311). If we can all stay there, our days would likely look like this:
Thursday, 8/28

- Everyone arrives to Barstow, CA - stays at Holiday Inn Express or nearby

Friday 8/29

- Leave hotel in Barstow, drive to Baker
- 9am: meet Hannah Arkin and team at 66150 Rasor Road, Baker CA 92309 (Shell Gas Station parking lot)
- 11am: conclude site visit
- Drive back to hotel in Barstow, lunch, freshen up, etc.
- 1pm: arrive to the conference room ~2 hrs early to finish set up and get situated
- 3pm-7pm: hybrid info/scoping meeting

Information from Hannah Arkin:

1. **Site Visit Time**: 9am-11am

2. **Location**: Meet at 66150 Rasor Road, Baker CA 92309. This is the Shell Gas Station parking lot, which is the closest public location to the project site. Hannah will provide a site map as we get closer to the date, identifying the tour route.
3. **Contact:** Hannah Arkin, 760-504-4109, hannah@resolutionenvironmental.com

Thank you very much, everyone!
Kaycee

Kaycee Chang (she, her, hers)
Supervisor
Siting, Transmission, and Environmental Protection Division

Book time to meet with me

From: Hannah Arkin <hannah@resolutionenvironmental.com>
Sent: Wednesday, July 30, 2025 1:06 PM
To: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; House, Rosemary@Energy <Rosemary.House@Energy.ca.gov>; Sandoval-Moreno, Victoria@Energy <Victoria.Sandoval-Moreno@energy.ca.gov>
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/28 or 8/29)

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Hi Kaycee,

Thank you for your email. We would be delighted to host a site visit on 8/28 or 8/29.

If we host the visit before the scoping meeting on 8/29, I would suggest the following:

1. **Time**: 9am-11am
2. **Location**: Meet at 66150 Rasor Road, Baker CA 92309. This is the Shell Gas Station parking lot, which is the closest public location to our project site. Alternatively, I am happy to arrange carpools from any Barstow hotel to the project site. I will provide a site map as we get closer to the date, identifying the tour route.
3. **Contact:** Hannah Arkin, 760-504-4109, hannah@resolutionenvironmental.com

Given the remote nature of the site and associated travel times, your team may want to consider having the site tour on 8/28. We are able to make either day work. Please just let us know what works best for your side.

Thank you!
Hannah

Hannah Arkin
CEO
Resolution Environmental
262 B Avenue, Coronado, CA 92118
760-504-4109

From: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Sent: Tuesday, July 29, 2025 6:02 PM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; House, Rosemary@Energy <Rosemary.House@Energy.ca.gov>; Sandoval-Moreno, Victoria@Energy <Victoria.Sandoval-Moreno@energy.ca.gov>
Subject: Site Visit Request for Soda Mountain Solar Project (8/28 or 8/29)

Hi Hannah,

Hope you're doing well! We appreciate your efforts getting us all the information quickly as we are working towards deeming Soda Mountain complete on 7/31. Lisa shared yesterday that the only date that works on our side for the hybrid informational/scoping meeting is 8/29/25, from 3-7pm to balance between business and non-business hours (with the understanding that the event may end early depending on number of attendees).

I believe you and Lisa have discussed this, but we wanted to put the ask in an email and loop in the Chair and Commissioner's schedulers/travel coordinators: In addition to the meeting, **can we request a site visit before the meeting, either the afternoon of 8/28 or the morning of 8/29?**

Commissioner Gallardo and our Executive Director, Drew Bohan, would be in attendance, along with potentially staff from our Siting Division. Rosemary House is in charge of Commissioner Gallardo's calendar and Victoria Sandoval-Moreno is in charge of Drew's.

If the morning of 8/29 works best, we would probably want to get back to the venue 2-3 hours before the meeting, so around 12-1pm.

At minimum, the following information would be helpful for the site visit:

1. Time
2. Location - specific information on where to meet, and maybe a map, would be helpful
3. Contact name, email, and phone number for day of coordination and for emergencies

Thank you very much!
Kaycee

Kaycee Chang (she, her, hers)
Supervisor
CEQA Project Management
Siting and Environmental Branch
Siting, Transmission, and Environmental Protection Division
Work: 1-916-232-6319
Cell: 1-916-208-6545

California Energy Commission
Website: www.energy.ca.gov





Book time to meet with me

From: Hannah Arkin [hannah@resolutionenvironmental.com]
Sent: 8/28/2025 4:09:46 PM
To: Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]; Knight, Eric@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=be42548337f44852a291a9845f226f62-Knight, Eri]
CC: Worrall, Lisa@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4bbc7048b38485084bdb03fb494b25b-Worrall, Li]
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/29)

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Hi Kaycee,

Thank you for confirming. Our team is happy to provide the off-road transportation for all attendees during the site tour.

We look forward to meeting you all in person on Friday!

Best,
Hannah

Hannah Arkin
CEO
Resolution Environmental
262 B Avenue, Coronado, CA 92118
760-504-4109

From: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Sent: Thursday, August 28, 2025 8:41:45 AM
To: Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/29)

Hello Hannah,

Thanks for all your help! I wanted to confirm that we will have nine (9) CEC attendees:

1. Commissioner Gallardo
2. Jimmy Qaqundah
3. Chair Hochschild
4. Caroline Grey
5. Drew Bohan
6. Eric Knight
7. Dian Vorters
8. Kaycee Chang
9. Devin Black

We look forward to both the site visit and our meeting on Friday.

Thank you,

Kaycee

Kaycee Chang (she, her, hers)
Supervisor
Siting, Transmission, and Environmental Protection Division
Book time to meet with me

From: Knight, Eric@Energy <Eric.Knight@energy.ca.gov>
Sent: Tuesday, August 26, 2025 3:10 PM
To: Hannah Arkin <hannah@resolutionenvironmental.com>; Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/29)

Update: The CEC team will vanpool and meet the Soda Mtn team at the Rasor Rd Shell Station to load into the Soda Mtn team SUVs for the site visit. Thank you Hannah!

Eric Knight
Program Manager
Siting, Transmission, and Environmental Protection Division

From: Hannah Arkin <hannah@resolutionenvironmental.com>
Sent: Tuesday, August 26, 2025 9:13 AM
To: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; Knight, Eric@Energy <Eric.Knight@energy.ca.gov>
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/29)

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Best,
Hannah

Hannah Arkin
CEO
Resolution Environmental
262 B Avenue, Coronado, CA 92118
760-504-4109

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Sent: Monday, August 25, 2025 11:46 AM
To: Hannah Arkin <hannah@resolutionenvironmental.com>

Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; Knight, Eric@Energy <Eric.Knight@energy.ca.gov>
Subject: Re: Site Visit Request for Soda Mountain Solar Project (8/29)

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Thank you so much,
Kaycee

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Siting, Transmission, and Environmental Protection Division
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Kaycee

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Supervisor
Siting, Transmission, and Environmental Protection Division

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Thank you very much, everyone!

Kaycee

Kaycee Chang (she, her, hers)
Supervisor
Siting, Transmission, and Environmental Protection Division
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Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; House, Rosemary@Energy <Rosemary.House@Energy.ca.gov>; Sandoval-Moreno, Victoria@Energy <Victoria.Sandoval-Moreno@energy.ca.gov>
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Hi Kaycee,

Thank you for your email. We would be delighted to host a site visit on 8/28 or 8/29.

If we host the visit before the scoping meeting on 8/29, I would suggest the following:

1. **Time**: 9am-11am
2. **Location**: Meet at 66150 Rasor Road, Baker CA 92309. This is the Shell Gas Station parking lot, which is the closest public location to our project site. Alternatively, I am happy to arrange carpools from any Barstow hotel to the project site. I will provide a site map as we get closer to the date, identifying the tour route.
3. **Contact:** Hannah Arkin, 760-504-4109, hannah@resolutionenvironmental.com

Given the remote nature of the site and associated travel times, your team may want to consider having the site tour on 8/28. We are able to make either day work. Please just let us know what works best for your side.

Thank you!
Hannah

Hannah Arkin
CEO
Resolution Environmental
262 B Avenue, Coronado, CA 92118
760-504-4109

From: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Sent: Tuesday, July 29, 2025 6:02 PM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; House, Rosemary@Energy <Rosemary.House@Energy.ca.gov>; Sandoval-Moreno, Victoria@Energy <Victoria.Sandoval-

Moreno@energy.ca.gov>
Subject: Site Visit Request for Soda Mountain Solar Project (8/28 or 8/29)

Hi Hannah,

Hope you're doing well! We appreciate your efforts getting us all the information quickly as we are working towards deeming Soda Mountain complete on 7/31. Lisa shared yesterday that the only date that works on our side for the hybrid informational/scoping meeting is 8/29/25, from 3-7pm to balance between business and non-business hours (with the understanding that the event may end early depending on number of attendees).

I believe you and Lisa have discussed this, but we wanted to put the ask in an email and loop in the Chair and Commissioner's schedulers/travel coordinators: In addition to the meeting, **can we request a site visit before the meeting, either the afternoon of 8/28 or the morning of 8/29?**

Commissioner Gallardo and our Executive Director, Drew Bohan, would be in attendance, along with potentially staff from our Siting Division. Rosemary House is in charge of Commissioner Gallardo's calendar and Victoria Sandoval-Moreno is in charge of Drew's.

If the morning of 8/29 works best, we would probably want to get back to the venue 2-3 hours before the meeting, so around 12-1pm.

At minimum, the following information would be helpful for the site visit:

1. Time
2. Location - specific information on where to meet, and maybe a map, would be helpful
3. Contact name, email, and phone number for day of coordination and for emergencies

Thank you very much!
Kaycee

Kaycee Chang (she, her, hers)
Supervisor
CEQA Project Management
Siting and Environmental Branch
Siting, Transmission, and Environmental Protection Division
Work: 1-916-232-6319
Cell: 1-916-208-6545

California Energy Commission
Website: www.energy.ca.gov





Book time to meet with me

From: Chang, Kaycee@Energy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DD3D2FC8670840BDA4ACDC455903E787-CHANG, KAYC]
Sent: 8/28/2025 7:09:59 PM
To: Patrovsky, Joan E [jpatrovs@blm.gov]; Worrall, Lisa@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4bbc7048b38485084bdb03fb494b25b-Worrall, Li]
CC: Stamer, Marc R [mstamer@blm.gov]; Knight, Eric@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=be42548337f44852a291a9845f226f62-Knight, Eri]
Subject: Re: BLM & CEC - Soda Mtn Solar Project Amendment
Attachments: IM Department Review of Solar and Wind.pdf

Hello Joan,

We appreciate our ongoing coordination as well; thank you for your time yesterday.

Adding Lisa and Eric Knight, our manager, to this email. I took a peek at our calendars and we should be available between 2-5pm on Thursday, September 4. We would appreciate if you could send a calendar invite for the time that works best for you and Marc Stamer.

Thank you,
Kaycee

Kaycee Chang (she, her, hers)
Supervisor
Siting, Transmission, and Environmental Protection Division
Book time to meet with me

From: Patrovsky, Joan E <jpatrovs@blm.gov>
Sent: Thursday, August 28, 2025 11:55 AM
To: lisa worrll <lworrll@energy.state.ca.us>; Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Cc: Stamer, Marc R <mstamer@blm.gov>
Subject: BLM & CEC - Soda Mtn Solar Project Amendment

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good day Lisa and Karcee,

The Bureau of Land Management (BLM) greatly appreciates our ongoing interagency coordination regarding the proposed Soda Mountain Solar Project.

BLM Field Manager Marc Stamer and I would like to schedule a call with you to discuss the status of the amendment application filed, as well as our perspective on the NEPA schedule.

As you may be aware, the Administration—through recent Executive Orders and Department of the Interior (DOI) guidance—has established new procedures for renewable energy projects. Please see the attached memorandum outlining updated requirements for wind and solar projects. Under this direction, all such projects must undergo additional review by the DOI prior to further processing.

We would like to propose a 30-minute call on **Thursday, September 4**. Please let us know your availability.

Best regards,

Joan Patrovsky, PMP
Project Manager
U.S. Department of the Interior - Region 8 and 10
Bureau of Land Management
California Desert District Office



"What you do today can improve all your tomorrows."- Ralph Marston

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United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, DC 20240

JULY 15 2025

Memorandum

To: Assistant Secretaries
Bureau and Office Heads

From: Deputy Chief of Staff – Policy

GREGORY WISCHER
Digitally signed by GREGORY WISCHER
Date: 2025.07.15 10:58:31 -04'00'

Subject: Departmental Review Procedures for Decisions, Actions, Consultations, and Other Undertakings Related to Wind and Solar Energy Facilities

Consistent with Executive Order (EO) 14315, entitled "Ending Market Distorting Subsidies for Unreliable, Foreign-Controlled Energy Sources," EO 14156, entitled "Declaring a National Energy Emergency," Presidential Memorandum, entitled "Temporary Withdrawal of All Areas on the Outer Continental Shelf from Offshore Wind Leasing and Review of the Federal Government's Leasing and Permitting Practices for Wind Projects," Secretary's Order (SO) 3417, entitled "Addressing the National Energy Emergency," and SO 3418, entitled "Unleashing American Energy," all decisions, actions, consultations, and other undertakings—including but not limited to the following—related to wind and solar energy facilities shall require submission to the Office of the Executive Secretariat and Regulatory Affairs, subsequent review by the Office of the Deputy Secretary, and final review by the Office of the Secretary:

1. *Federal Register* notices;
2. notices to proceed;
3. scoping reports;
4. determinations of National Environmental Policy Act (NEPA) adequacy;
5. draft and final environmental assessments;
6. draft, final, and supplemental environmental impact statements;
7. findings of no significant impact;
8. records of decision;
9. approval letters;
10. plans of development;
11. land use plan amendments and revisions;
12. land withdrawals and revocations;
13. areas of critical environmental concern designations;
14. site testing and monitoring authorizations;

15. proposed and final sale notices;
16. lease sales;
17. lease assignments;
18. lease issuances;
19. proofs of construction;
20. site assessment plans;
21. preconstruction environmental surveys;
22. supplemental environmental reports;
23. temporary use permits;
24. access road authorizations;
25. utility corridor concurrences;
26. facility design reports;
27. fabrication and installation reports;
28. certified verification agent approvals;
29. construction and operation plans (COPs);
30. conditions of COP approvals;
31. COP revisions;
32. Engineering and Technical Review Branch recommendation memos;
33. proposed technical and navigational and aviation safety conditions;
34. cable burial risk assessments;
35. oil spill response plans;
36. decommissioning applications;
37. Outer Continental Shelf Lands Act compliance memos;
38. compendium reports;
39. memoranda of agreement;
40. compensatory mitigation plans;
41. historic properties management plans;
42. historic properties treatment plans;
43. performance and reclamation bonding approvals;
44. rental and royalty determinations;
45. cost recovery agreements;
46. financial assurances;
47. rights-of-use and easement;
48. right-of-way (ROW) applications;

49. ROW grants;
50. ROW leases;
51. ROW transfers;
52. leases and ROWs on Tribal lands;
53. Tribal environmental impact reviews;
54. government-to-government Tribal consultations;
55. Wild and Scenic Rivers Act determinations;
56. National Trails System impact evaluations;
57. National Landscape Conservation System coordination;
58. visual impact assessments;
59. visual resource management analyses;
60. cumulative historic resources visual effects analyses;
61. cultural resource consultations;
62. section 106 compliance under the National Historic Preservation Act;
63. consultation under the Magnuson-Stevens Fishery Conservation and Management Act, Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), and Bald and Golden Eagle Protection Act (BGEPA);
64. permits under the ESA, MBTA, and BGEPA;
65. biological assessments;
66. biological opinions;
67. approval and publication of studies and assessments, including ecological baseline studies;
68. grants; and
69. any other similar or related decisions, actions, consultations, or undertakings.

These review procedures are effectively immediately.

Cc: Deputy Assistant Secretaries
Bureau and Office Deputy Heads
Assistant Secretary Chiefs of Staff
Bureau and Office Chiefs of Staff

From: Patrovsky, Joan E [jpatrovs@blm.gov]
Sent: 8/28/2025 7:55:39 PM
To: Stamer, Marc R [mstamer@blm.gov]; Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]; Knight, Eric@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=be42548337f44852a291a9845f226f62-Knight, Eri]; Worrall, Lisa@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4bbc7048b38485084bdb03fb494b25b-Worrall, Li]
Subject: BLM & CEC - DOI process Solar projects
Location: Microsoft Teams Meeting
Start: 9/4/2025 9:00:00 PM
End: 9/4/2025 9:30:00 PM
Show Time As: Tentative
Recurrence: (none)

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Interagency management discussion relative to US Departmental Interior Memorandum and Executive Orders; Soda Mountain Solar amendment application status.

Microsoft Teams Need help?

Join the meeting now

Meeting ID: 271 922 988 167 7

Passcode: Z36MQ7Gf

For organizers: Meeting options

From: Hannah Arkin [hannah@resolutionenvironmental.com]
Sent: 7/22/2025 6:02:33 PM
To: Worrall, Lisa@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4bbc7048b38485084bdb03fb494b25b-Worrall, Li]
CC: Record, Jacquelyn@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=80a752975c1d44efbd17fb602595a1e7-Leyva, Jacq]; Ding, Yifan@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=49ee78637b0648578196965a7385b6f2-6d1c78d5-11]; Qian, Wenjun@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4421be8df5f40ec851d73affcbff913-Qian, Wenju]; Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]
Subject: Re: Soda Mountain- text in Appendix C- Air Quality GHG Report- July 2025 Review blacked out

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Yes! I will get them from Rincon, along with the best time for the CDFW meeting.

Thank you!
Hannah

Hannah Arkin
CEO
Resolution Environmental
262 B Avenue, Coronado, CA 92118
760-504-4109

From: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Sent: Tuesday, July 22, 2025 10:59:11 AM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Record, Jacquelyn@Energy <Jacquelyn.Record@energy.ca.gov>; Ding, Yifan@Energy <Yifan.Ding@Energy.ca.gov>; Qian, Wenjun@Energy <Wenjun.Qian@energy.ca.gov>; Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Re: Soda Mountain- text in Appendix C- Air Quality GHG Report- July 2025 Review blacked out

Okay. I will check with dockets. Also, can you send me any updated GIS shape files and new shape files. Thanks.

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

715 P Street, MS-40, Sacramento, CA 95814
1-916-661-8367

California Energy Commission
Website: www.energy.ca.gov

From: Hannah Arkin <hannah@resolutionenvironmental.com>
Sent: Tuesday, July 22, 2025 10:58 AM
To: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Cc: Record, Jacquelyn@Energy <Jacquelyn.Record@energy.ca.gov>; Ding, Yifan@Energy <Yifan.Ding@Energy.ca.gov>; Qian, Wenjun@Energy <Wenjun.Qian@energy.ca.gov>; Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Re: Soda Mountain- text in Appendix C- Air Quality GHG Report- July 2025 Review blacked out

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Lisa,

This document is part of the confidential filing. We filed 6 documents total as confidential, please let me know if you have any issue receiving them.

Hannah

Hannah Arkin
CEO
Resolution Environmental
262 B Avenue, Coronado, CA 92118
760-504-4109

From: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Sent: Tuesday, July 22, 2025 10:54:56 AM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Record, Jacquelyn@Energy <Jacquelyn.Record@energy.ca.gov>; Ding, Yifan@Energy <Yifan.Ding@Energy.ca.gov>; Qian, Wenjun@Energy <Wenjun.Qian@energy.ca.gov>; Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Soda Mountain- text in Appendix C- Air Quality GHG Report- July 2025 Review blacked out

Hi Hannah,

GHG staff saw that there was some text on pages 45 and 46 under BESS refrigerant, the section that is totally blacked out. Was this in error, or is there supposed to be a confidential filing that we haven't received yet? Staff need this information to complete their review.

Appendix C - Air Quality GHG Report - July 2025 Revision

Thanks,

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

715 P Street, MS-40, Sacramento, CA 95814
1-916-661-8367

California Energy Commission
Website: www.energy.ca.gov



From: Hannah Arkin [hannah@resolutionenvironmental.com]
Sent: 7/29/2025 11:50:17 PM
To: Worrall, Lisa@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4bbc7048b38485084bdb03fb494b25b-Worrall, Li]
CC: Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]; Ackerman, James@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3cc35de240cf4253af9cc7d3d2cbb643-Ackerman, J]; Abulaban, Abdel-Karim@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c1ff1d38281a4068b2708271d22c0d94-Abulaban, A]
Subject: Re: Soda Mt. Water-1 Information

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On it, thank you! - Hannah

Hannah Arkin
CEO
Resolution Environmental
262 B Avenue, Coronado, CA 92118
760-504-4109

From: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Sent: Tuesday, July 29, 2025 4:03:14 PM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>; Ackerman, James@Energy <james.ackerman@energy.ca.gov>; Abulaban, Abdel-Karim@Energy <Abdel-Karim.Abulaban@energy.ca.gov>
Subject: Fw: Soda Mt. Water-1 Information

Hi Hannah,

I have more feedback from our water resources staff. Please address all of these questions.

Thanks,

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

715 P Street, MS-40, Sacramento, CA 95814
1-916-661-8367

California Energy Commission
Website: www.energy.ca.gov

From: Ackerman, James@Energy <james.ackerman@energy.ca.gov>
Sent: Tuesday, July 29, 2025 3:59 PM
To: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; Abulaban, Abdel-Karim@Energy <Abdel-Karim.Abulaban@energy.ca.gov>
Cc: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: RE: Soda Mt. Water-1 Information

Lisa: I agree that the four documents listed should be docketed.

However, I don't believe they address my concerns regarding my question that became Rev 2 DR WATER-1, namely that the data used for groundwater modeling was from outside the Soda Mountain groundwater subbasin.

The Hydrogeological Conditions and Groundwater Modeling Addendum (TRC Solutions 2013) and the Groundwater Modeling Sensitivity Analysis (Burns & McDonald 2014) were both appendices of the original BLM EIR for the Soda Mountain Solar project and addressed the impact to the public groundwater production well at the Zzyzx facility across the Soda Mountains for the project site.

As stated in these two documents, the data supporting the modeling was taken from local regional wells outside the Soda Mountain groundwater subbasin.

Moreover, these documents introduce additional questions:

- Will the locations of proposed production wells more closely resemble the Hydrogeological Conditions and Groundwater Modeling Addendum (5 wells) or the Groundwater Modeling Sensitivity Analysis (3 wells).
- The Groundwater Modeling Sensitivity Analysis proposes groundwater drawdown monitoring incorporating a network of five monitoring wells and the Zzyzx groundwater production well. Will this monitoring program be incorporated into the project?

In addition, the original Soda Mountain Solar project BLM EIR indicates that aquifer characterization was conducted from a test well (PW-1) and an observation well (OW-1) located 187 feet apart along Blue Bell Mine Road.

The following documents, in addition to the previous questions, would be beneficial in completing the analysis of impacts to the Soda Mountain subbasin groundwater resources:

- Site specific geotechnical and geophysical data referenced in the TRC Solutions report;
    - Diaz-Yourman and Associates. 2010. Preliminary Geotechnical Investigation (Phase 1A), Caithness Soda Mountain Solar Facility Project, Baker, San Bernardino County, California. December 2010, 85 p.
    - Terra Physics, 2010. Geophysical Characterization of Subsurface Physical Properties, Caithness LLC—Soda Mountain Solar Facility, Southwest of Baker, San Bernardino County, California, dated December 10, 2010, Project No. 09-63, 58 p. Prepared for Wilson Geosciences, December 2011.
- Aquifer characterization reference cited in the Soda Mountain Solar project BLM EIR;
    - Panorama Environmental, Inc., 2014. Groundwater Well Test Report. November.

James Ackerman, PG #6493
Engineering Geologist
California Energy Commission
Siting, Transmission and Environmental Protection Division
Direct: (530) 878-4966
Email: james.ackerman@energy.ca.gov

From: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Sent: Tuesday, July 29, 2025 1:12 PM
To: Ackerman, James@Energy <james.ackerman@energy.ca.gov>; Abulaban, Abdel-Karim@Energy <Abdel-Karim.Abulaban@energy.ca.gov>
Cc: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Re: Soda Mt. Water-1 Information

Great.

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

715 P Street, MS-40, Sacramento, CA 95814
1-916-661-8367

California Energy Commission
Website: www.energy.ca.gov

From: Ackerman, James@Energy <james.ackerman@energy.ca.gov>
Sent: Tuesday, July 29, 2025 12:00 PM
To: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; Abulaban, Abdel-Karim@Energy <Abdel-Karim.Abulaban@energy.ca.gov>
Cc: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: RE: Soda Mt. Water-1 Information

Lisa: I am in the process reviewing the documents now.

The revision to Section 4.3.4 of the 7/22/25 WSA makes the section more accurate.

James Ackerman, PG #6493
Engineering Geologist
California Energy Commission
Siting, Transmission and Environmental Protection Division
Direct: (530) 878-4966
Email: james.ackerman@energy.ca.gov

From: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Sent: Monday, July 28, 2025 8:50 AM
To: Ackerman, James@Energy <james.ackerman@energy.ca.gov>; Abulaban, Abdel-Karim@Energy <Abdel-Karim.Abulaban@energy.ca.gov>
Cc: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Fw: Soda Mt. Water-1 Information

FYI. I plan on having the applicant docket these with the rest of their responses to our REV 2 data requests. Please review these and let me know if they make water resources complete.

Thanks.

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

715 P Street, MS-40, Sacramento, CA 95814
1-916-661-8367

California Energy Commission
Website: www.energy.ca.gov

From: Hannah Arkin <hannah@resolutionenvironmental.com>
Sent: Monday, July 28, 2025 8:44 AM
To: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Soda Mt. Water-1 Information

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Lisa,

Our response to REV 2 DR Water-1 is below. If you need us to provide all the reference documents for the report, we are happy to do that.

I anticipate getting you some more responses later today and the remaining responses by end of day tomorrow. We are putting the final touches on the bighorn sheep technical memo and will docket that shortly.

Thank you!
Hannah

Hannah Arkin
CEO
Resolution Environmental
262 B Avenue, Coronado, CA 92118
760-504-4109

Responses to CEC comments in blue font below –

WATER RESOURCES
The latest water supply assessment (TN264970, July 2025) states in Section 4.3.4, Page 16, that "The only existing producer in the Subbasin is the groundwater well installed at the Rasor Road Service Station near the southwest corner of the project site". However, according to the DWR Groundwater Basin Boundary Assessment Tool website, (https://gis.water.ca.gov/app/bbat/) this well is not located in the Soda Mountain subbasin of the Soda Lake Valley groundwater basin (6-033), but in the Cronise Valley groundwater basin (6-035). Review of the DWR Well Completion Report website (https://www.arcgis.com/apps/webappviewer/index.html?id=181078580a214c0986e2d a28f8623b37) indicates no wells within the Soda Mountain subbasin. Also, there does not appear to be any wells or data points in the subbasin.

- Section 4.3.4 has been revised to clarify that three are no existing producers in the Subbasin (saved with "_Rev 25Jul25" at end of file name):

REV 2 DR WATER-1. Please explain if any of the impact analysis of the Soda Mountain subbasin groundwater resource is based on the data from the subbasin? If so, please submit this data to the project docket.
Yes, analysis of the Subbasin was based on data from the Subbasin – specifically, test well PW-1 which was installed to conduct groundwater investigations for the 2015 EIS, as detailed in Appendices H1 through H4 to the 2015 EIS. Those documents are referenced in the Water Supply Report and a PDF of each is included

RINCON

David Daitch, Ph.D.
Vice President, Natural Resources
ddaitch@rinconconsultants.com
805-644-4455 Main | 303-818-6072 Mobile | 831-920-5422 Direct
Sacramento, California

From: Worrall, Lisa@Energy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E4BBC7048B38485084BDB03FB494B25B-WORRALL, LI]
Sent: 7/24/2025 12:32:38 AM
To: Hannah Gbeh [hannah@resolutionenvironmental.com]
CC: Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]
Subject: Hybrid Informational/Scoping Meeting Arrangements - Soda Mountain Solar Project
Attachments: Public Meeting Venue Scoping_SodaMountain.xlsx; Hybrid Meeting Scoping and Arrangements.docx

Hello Hannah,

Thank you for offering to help with securing a meeting site when we were discussing the Soda Mountain schedule last Friday. If you are still open to it, we would like to request you take the lead in assisting us with securing a hybrid meeting venue for the informational/scoping meeting that must occur within 30 days of the application being deemed complete. As noted in the attached guidance, we do retain oversight and need to be informed of progress. Due to the timing for this application, some of the information in the guidance, such as the timeframes to communicate with me as the PM, do not apply. In addition, we began some of our scoping efforts in anticipation of the application being complete. Please review the attached spreadsheet, add any additional potential venues you are aware of, and proceed with Step #6 in the document (informing me of your top 3 venue recommendations).

Email Attachments

1. Hybrid Meeting Scoping and Arrangements - guidance on steps, communications with project manager, and additional arrangements
2. Public Meeting Venue Scoping_SodaMountain - spreadsheet on potential locations

Please let us know if you have any questions, and I look forward to hearing your updates.

Thank kindly,

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

715 P Street, MS-40, Sacramento, CA 95814
1-916-661-8367

California Energy Commission
Website: www.energy.ca.gov

From: Worrall, Lisa@Energy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E4BBC7048B38485084BDB03FB494B25B-WORRALL, LI]
Sent: 7/28/2025 3:52:29 PM
To: Hannah Arkin [hannah@resolutionenvironmental.com]; Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]
Subject: Re: Soda Mt. Water-1 Information

Excellent. Thanks Hannah.

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

715 P Street, MS-40, Sacramento, CA 95814
1-916-661-8367

California Energy Commission
Website: www.energy.ca.gov

From: Hannah Arkin <hannah@resolutionenvironmental.com>
Sent: Monday, July 28, 2025 8:44 AM
To: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>; Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Soda Mt. Water-1 Information

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Lisa,

Our response to REV 2 DR Water-1 is below. If you need us to provide all the reference documents for the report, we are happy to do that.

I anticipate getting you some more responses later today and the remaining responses by end of day tomorrow. We are putting the final touches on the bighorn sheep technical memo and will docket that shortly.

Thank you!
Hannah

Hannah Arkin
CEO

Resolution Environmental
262 B Avenue, Coronado, CA 92118
760-504-4109

Responses to CEC comments in blue font below –

WATER RESOURCES

The latest water supply assessment (TN264970, July 2025) states in Section 4.3.4, Page 16, that "The only existing producer in the Subbasin is the groundwater well installed at the Rasor Road Service Station near the southwest corner of the project site". However, according to the DWR Groundwater Basin Boundary Assessment Tool website, (https://gis.water.ca.gov/app/bbat/) this well is not located in the Soda Mountain subbasin of the Soda Lake Valley groundwater basin (6-033), but in the Cronise Valley groundwater basin (6-035). Review of the DWR Well Completion Report website (https://www.arcgis.com/apps/webappviewer/index.html?id=181078580a214c0986e2d a28f8623b37) indicates no wells within the Soda Mountain subbasin. Also, there does not appear to be any wells or data points in the subbasin.

- Section 4.3.4 has been revised to clarify that three are no existing producers in the Subbasin (saved with "_Rev 25Jul25" at end of file name):

REV 2 DR WATER-1. Please explain if any of the impact analysis of the Soda Mountain subbasin groundwater resource is based on the data from the subbasin? If so, please submit this data to the project docket.

Yes, analysis of the Subbasin was based on data from the Subbasin – specifically, test well PW-1 which was installed to conduct groundwater investigations for the 2015 EIS, as detailed in Appendices H1 through H4 to the 2015 EIS. Those documents are referenced in the Water Supply Report and a PDF of each is included

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Sacramento, California

From: Worrall, Lisa@Energy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E4BBC7048B38485084BDB03FB494B25B-WORRALL, LI]
Sent: 8/15/2025 5:58:35 PM
To: Hannah Arkin [hannah@resolutionenvironmental.com]
CC: Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]
Subject: Re: Public interest for Soda Mountain Solar Project

Thank you Hannah. We are looking at starting the site visit earlier. I will let you know when hear more.

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

715 P Street, MS-40, Sacramento, CA 95814
1-916-661-8367

California Energy Commission
Website: www.energy.ca.gov

From: Hannah Arkin <hannah@resolutionenvironmental.com>
Sent: Friday, August 15, 2025 10:12 AM
To: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Cc: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Re: Public interest for Soda Mountain Solar Project

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Hi Lisa,

At the moment, we have not seen much interest in the project from our outreach efforts in both Barstow and Baker. Therefore, I see no issue with moving the meeting from 1pm-5pm. We might also want to consider moving the site visit earlier, as it does get pretty hot by 11am in the desert.

Thanks!
Hannah

From: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Sent: Friday, August 15, 2025 10:01 AM

To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Public interest for Soda Mountain Solar Project

Hi Hannah,

Can you let me know what you are hearing about public interest in the Soda Mountain Solar Project from the community of Baker and other members of the public that might participate in the meeting?

We are looking at possibly moving the meeting up to start at 1 pm and close at 5 pm, but want to get a sense of whether we think there will be a lot of local interest where people would find it difficult to participate due to then meeting possibly being held during business hours.

Thanks,

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

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From: Worrall, Lisa@Energy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E4BBC7048B38485084BDB03FB494B25B-WORRALL, LI]
Sent: 8/15/2025 7:14:36 PM
To: Hannah Arkin [hannah@resolutionenvironmental.com]
CC: Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]
Subject: Re: Public interest for Soda Mountain Solar Project

Wonderful. Thank you so much. This will be very helpful.

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

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Website: www.energy.ca.gov

From: Hannah Arkin <hannah@resolutionenvironmental.com>
Sent: Friday, August 15, 2025 12:14 PM
To: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Cc: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Re: Public interest for Soda Mountain Solar Project

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Hi Lisa,

Absolutely! We will provide this.

Hannah

Hannah Arkin
CEO
Resolution Environmental
262 B Avenue, Coronado, CA 92118
760-504-4109

From: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Sent: Friday, August 15, 2025 11:11 AM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Re: Public interest for Soda Mountain Solar Project

Hi Hannah,

The venue doesn't have a tv monitor and it would be very helpful so that we on the dais can see the slides as they are presented.

Is it possible you can provide a mobile tv monitor for the meeting?

Thanks,

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

715 P Street, MS-40, Sacramento, CA 95814
1-916-661-8367

California Energy Commission
Website: www.energy.ca.gov

From: Hannah Arkin <hannah@resolutionenvironmental.com>
Sent: Friday, August 15, 2025 10:12 AM
To: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Cc: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Re: Public interest for Soda Mountain Solar Project

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Hi Lisa,

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Thanks!
Hannah

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Sent: Friday, August 15, 2025 10:01 AM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Public interest for Soda Mountain Solar Project

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Thanks,

Lisa Worrall
Senior Environmental Planner
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Siting, Transmission and Environmental Protection Division (STEP)

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1-916-661-8367

California Energy Commission
Website: www.energy.ca.gov



From: Worrall, Lisa@Energy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E4BBC7048B38485084BDB03FB494B25B-WORRALL, LI]
Sent: 8/20/2025 6:24:38 PM
To: Hannah Arkin [hannah@resolutionenvironmental.com]
CC: Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]
Subject: Soda Mountain- published public notice for information and environmental scoping meeting

Hi Hannah,

I posted the public notice of the August 29th Information and Environmental Scoping meeting to be held from 1 pm to 5 pm. I just posted an update to the notice to correct the webinar ID.

I also have sent the signed contract to the Holiday Inn Express and we are working to get it paid.

I think it might be a good idea if you are providing bus service to the venue that you post a notice in the docket to notify interested people that you will provide bus transportation with the time of departure for the venue and location of meeting point for the bus. Also you might want to let them know that a return bus will be provided with departure following the meeting- or something like that. Whatever you decide.

Thanks,

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

715 P Street, MS-40, Sacramento, CA 95814
1-916-661-8367

California Energy Commission
Website: www.energy.ca.gov

From: Worrall, Lisa@Energy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E4BBC7048B38485084BDB03FB494B25B-WORRALL, LI]
Sent: 8/26/2025 10:25:14 PM
To: Hannah Arkin [hannah@resolutionenvironmental.com]
CC: Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]
Subject: Soda Mountain- Requested updates to project description figures for project description consistency and related questions

Hi Hannah,

I see in the Traffic Control Plan that was submitted as part of the Caltrans Encroachment Permit Application and BLM Traffic Control Plan that a permanent fenceline will bound the gen-tie route. Is this still correct?

In the Project Description section from Updated Project Description and Responses to REV 1 DR BIO 2 and REV 1 DR ES-1, it states the following:

Northwest of I-15, the project would use an existing travel route (CL 8847 and CL7682 from Zzyzx Road). CL 8847 and CL7682 are existing roadways that are publicly accessible. These roadways would not require any improvements during project construction or operation. As an alternative, the project may also construct and use a new temporary exit off southbound I-15 near the gen-tie corridor to access the gen-tie line corridor and switchyard.

Please make the following edits to Figure 2-7 and Figure 2-8:
Please show the proposed temporary access road from Zzyzx Road over CL 8847 and CL7682 to connect with the access road under the gen-tie route. Include this route in the project boundaries and add the temporary access road into the legend.

Please include a reference to where the other access via a new temporary on-off ramp from southbound I-15 would be located, with a reference in the legend.

Based on Figure 2-7, it appears that the existing Rasor Road alignment crosses through the proposed solar array 3. Would the alignment of Rasor Road need to be adjusted to avoid this solar array area? If so, please show that re-alignment and update the legend to note it. The existing centerline for Rasor Road is not shown through the project site on Figure 2-8, please show the existing centerline through the project and show any re-alignment proposed.

Thank you,

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

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From: Hannah Arkin [hannah@resolutionenvironmental.com]
Sent: 7/24/2025 12:34:44 AM
To: Worrall, Lisa@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4bbc7048b38485084bdb03fb494b25b-Worrall, Li]
CC: Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]
Subject: Re: Hybrid Informational/Scoping Meeting Arrangements - Soda Mountain Solar Project

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Absolutely! I am on it and will keep you posted.

Thank you!
Hannah

Hannah Arkin
CEO
Resolution Environmental
262 B Avenue, Coronado, CA 92118
760-504-4109

From: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Sent: Wednesday, July 23, 2025 5:32:38 PM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Hybrid Informational/Scoping Meeting Arrangements - Soda Mountain Solar Project

Hello Hannah,

Thank you for offering to help with securing a meeting site when we were discussing the Soda Mountain schedule last Friday. If you are still open to it, we would like to request you take the lead in assisting us with securing a hybrid meeting venue for the informational/scoping meeting that must occur within 30 days of the application being deemed complete. As noted in the attached guidance, we do retain oversight and need to be informed of progress. Due to the timing for this application, some of the information in the guidance, such as the timeframes to communicate with me as the PM, do not apply. In addition, we began some of our scoping efforts in anticipation of the application being complete. Please review the attached spreadsheet, add any additional potential venues you are aware of, and proceed with Step #6 in the document (informing me of your top 3 venue recommendations).

Email Attachments

1. Hybrid Meeting Scoping and Arrangements - guidance on steps, communications with project manager, and additional arrangements
2. Public Meeting Venue Scoping_SodaMountain - spreadsheet on potential locations

Please let us know if you have any questions, and I look forward to hearing your updates.

Thank kindly,

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit

Siting, Transmission and Environmental Protection Division (STEP)

715 P Street, MS-40, Sacramento, CA 95814
1-916-661-8367

California Energy Commission
Website: www.energy.ca.gov



From: Patrovsky, Joan E [jpatrovs@blm.gov]
Sent: 7/25/2025 12:19:46 AM
To: Worrall, Lisa@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4bbc7048b38485084bdb03fb494b25b-Worrall, Li]
CC: Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]; Tatiana Inouye [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d127e0699c844e88806bedbc7a2b371d-12c63cc3-33]; Negar Vahidi [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=cb23cc0e70ac4e44ab61714491954981-4e241c75-c7]
Subject: Re: [EXTERNAL] Soda Mountain Solar Project- Meeting request asap

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Hello Lisa,

The Bureau of Land Management (BLM) has determined that an Environmental Assessment (EA) is necessary to comply with NEPA regulations. However, the project holder is in disagreement on our determination.

Our renewable energy coordinator has scheduled a hybrid meeting with the Soda Mountain applicant and their representatives, along with the BLM State Office, on August 12. The purpose of this meeting is to discuss their concerns regarding the level of NEPA review and any other related issues.

To date, proposed changes to the Soda Mountain Solar project have not been submitted in a revised Plan of Development; the last version we have is dated March 2025. It is important that all proposed changes be evaluated together rather than individually.

Could you please provide some potential dates and times for a call?

Attendees from our side would include Barstow Field Manager Marc Stamer (mstamer@blm.gov), BLM Realty Specialist Isabeau Cordes (icordes@blm.gov), and myself. Our renewable energy coordinator, Nancy Robledo (lrobledo@blm.gov), might attend to share updates on ongoing directive changes for BLM solar projects.

Also, please note that Zoey (Caroline) Kaufman has left BLM for private endeavors.

Thank you, and I look forward to coordinating with you.

Best regards,
Joan Patrovsky, PMP
Project Manager
U.S. Department of the Interior - Region 8 and 10
Bureau of Land Management
California Desert District Office



"What you do today can improve all your tomorrows."- Ralph Marston

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From: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Sent: Thursday, July 24, 2025 12:54 PM
To: Patrovsky, Joan E <jpatrovs@blm.gov>
Cc: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>; Tatiana Inouye <tinouye@aspeneg.com>; Negar Vahidi <nvahidi@aspeneg.com>
Subject: [EXTERNAL] Soda Mountain Solar Project- Meeting request asap

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Hi Joan,

I would like to meet with you and other BLM staff as necessary to discuss some land use questions our staff has.

The applicant states that the current project would be consistent with the project that was approved by the BLM in a 2016 Record of Decision. Is that correct?

We understand that BLM has proposed an amendment to the West-Wide Energy Corridor that includes adjustments to energy corridor designations and revisions to IOPs. Would the BLM incorporate the proposed IOP revisions, where applicable, into the permit conditions for the proposed project's ROW grant authorization?

We are working to deem the Opt-In application complete next week and would like to discuss these questions and possibly other associated questions this week.

Please let me know your availability so I can send an invite to you.

Thanks kindly,

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

715 P Street, MS-40, Sacramento, CA 95814
1-916-661-8367

California Energy Commission

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Subject: Soda Mt. Water-1 Information
Attachments: Burns & McDonald and Panorama 2014_Appendix H4_Sensitivity Analysis.pdf; Panorama 2013_Appendix H1_Water Supply Assessment.pdf; TRC Solutions 2013_Appendix H3_Hydrogeologic Conditions.pdf; Soda Mt Water Supply Report_Final 22Jul25_Rev 25Jul25.docx

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Hi Lisa,

Our response to REV 2 DR Water-1 is below. If you need us to provide all the reference documents for the report, we are happy to do that.

I anticipate getting you some more responses later today and the remaining responses by end of day tomorrow. We are putting the final touches on the bighorn sheep technical memo and will docket that shortly.

Thank you!
Hannah

Hannah Arkin
CEO
Resolution Environmental
262 B Avenue, Coronado, CA 92118
760-504-4109

Responses to CEC comments in blue font below –

WATER RESOURCES
The latest water supply assessment (TN264970, July 2025) states in Section 4.3.4, Page 16, that "The only existing producer in the Subbasin is the groundwater well installed at the Rasor Road Service Station near the southwest corner of the project site". However, according to the DWR Groundwater Basin Boundary Assessment Tool website, (https://gis.water.ca.gov/app/bbat/) this well is not located in the Soda Mountain subbasin of the Soda Lake Valley groundwater basin (6-033), but in the Cronise Valley groundwater basin (6-035). Review of the DWR Well Completion Report website (https://www.arcgis.com/apps/webappviewer/index.html?id=181078580a214c0986e2d a28f8623b37) indicates no wells within the Soda Mountain subbasin. Also, there does not appear to be any wells or data points in the subbasin.

- Section 4.3.4 has been revised to clarify that three are no existing producers in the Subbasin (saved with "_Rev 25Jul25" at end of file name):

REV 2 DR WATER-1. Please explain if any of the impact analysis of the Soda Mountain subbasin groundwater resource is based on the data from the subbasin? If so, please submit this data to the project docket.
Yes, analysis of the Subbasin was based on data from the Subbasin – specifically, test well PW-1 which was installed to conduct groundwater investigations for the 2015 EIS, as detailed in Appendices H1 through H4 to the 2015 EIS. Those documents are referenced in the Water Supply Report and a PDF of each is included

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Vice President, Natural Resources
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805-644-4455 Main | 303-818-6072 Mobile | 831-920-5422 Direct
Sacramento, California

APPENDIX H-4
Sensitivity Analysis

SMSP01246

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Groundwater Modeling Sensitivity Analysis

Soda Mountain Solar Project

BLM Case No. CACA 49584

August 2014

Groundwater Modeling Sensitivity Analysis

Soda Mountain Solar Project

BLM Case No. CACA 49584

Submitted by:

Soda Mountain Solar, LLC
5275 Westview Drive
Frederick, MD 21703-8306
301-228-8110

Prepared by:

Burns & McDonnell
1 Pointe Drive, Suite 540
Brea, CA 92821
Contact: Galen Kenoyer

and

Panorama Environmental, Inc.
One Embarcadero Center, Suite 740
San Francisco, CA 94111
650-373-1200

TABLE OF CONTENTS

1 Introduction 1-1
1.1 Overview 1-1
1.2 Background 1-1
1.3 Sensitivity Analysis Objectives 1-2

2 Groundwater Models 2-1
2.1 Conceptual Model 2-1
2.2 Numerical Model 2-2

3 Analytical Model Sensitivity Analysis 3-7
3.1 Methodology 3-7
3.2 Results 3-8
3.3 Summary 3-9

4 References 4-1

List of Tables

Table 2.2-1: Selected Aquifer Parameters Used in Numerical Groundwater Model 2-2
Table 2.2-2: Summary of Modeling Results at Each Simulated Well[1] 2-3
Table 2.2-3: Groundwater Discharge at Northeast Outlet of Soda Mountain Valley 2-5
Table 2.2-4: Numerical Model Assumptions and Limitations 2-5
Table 3.1-1: Recharge and Conductivity Values Used in Sensitivity Analysis 3-8
Table 3.2-1: Sensitivity Analysis Results 3-8

List of Figures

Figure 1.1-1: Project Location 1-3
Figure 2.2-1: Potential Well Locations 2-4

List of Appendices

Appendix A: Drawdown Calculations

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1 INTRODUCTION

1.1 OVERVIEW

Soda Mountain Solar, LLC (SMS), proposes to construct, operate, maintain, and decommission the Soda Mountain Solar Project (project), which would be located in the Soda Mountain Valley in San Bernardino County, California, about 6 miles southwest of the Town of Baker (Figure 1.1-1). The proposed project would include withdrawal of approximately 192 acre-feet per year (AFY) of groundwater during a 24- to 30-month construction period and approximately 33 AFY during project operation. A groundwater flow model was developed for the project and presented in *Hydrogeologic Conditions and Groundwater Modeling Report* (RMT 2011) and *Hydrogeologic Conditions and Groundwater Modeling Report Addendum* (TRC 2013).

A groundwater modeling sensitivity analysis has been prepared to address National Park Service (NPS) and U.S. Geological Survey (USGS) comments on the groundwater flow model prepared by SMS. The sensitivity analysis incorporates a broad range of hydraulic conductivity values (0.2 feet/day [ft/day] to 20 ft/day) to reflect the potential for lower or higher recharge in the project area. The sensitivity analysis utilizing an analytical model also expands the model domain by excluding the limitations imposed by the bedrock present in the mountains that bound the valley in which the project would be located. The analysis provides a very conservative assessment of potential impacts to water resources within the Mojave National Preserve, located just east of the project area, and incorporates the range of hydraulic conductivity values that could characterize water-bearing sediments in the Soda Mountain Valley.

1.2 BACKGROUND

NPS and others have expressed concerns about potential impacts from project groundwater withdrawal in the Soda Mountain Valley on MC Spring (also referred to as Zzyzx Spring and Soda Spring) at the Desert Studies Center (DSC), which is located approximately 4 miles east of the eastern project boundary. MC Spring supports a population of Mohave tui chub (*Gila bicolor mohavensis*), which is a federal- and state-listed endangered species. SMS and NPS prepared separate groundwater models to assess the potential for the project to impact MC Spring.

The Department of the Interior requested that USGS conduct an independent evaluation of the SMS-prepared groundwater modeling reports and the NPS groundwater model. Keith Halford of USGS reviewed the groundwater flow models and provided comments in a June 30, 2014, letter to the Bureau of Land Management (BLM) (Halford 2014a). Mr. Halford concluded that the results of both models showed that construction and operational water use for the proposed project will "not measurably affect discharge from the Zzyzx area because a considerable

volume of groundwater storage exists between the proposed production wells and the Zzyzx area"(Halford 2014a). USGS suggested that recharge and the associated values of hydraulic conductivity were likely overestimated in the SMS model. On a related note, BLM has directed SMS to conduct an aquifer test to define the aquifer parameters in the valley, including hydraulic conductivity. The aquifer test will be performed by September 2014, and resultant aquifer parameters will be used to test the assumptions used in the SMS model and recalibrate the numerical groundwater flow model, if appropriate.

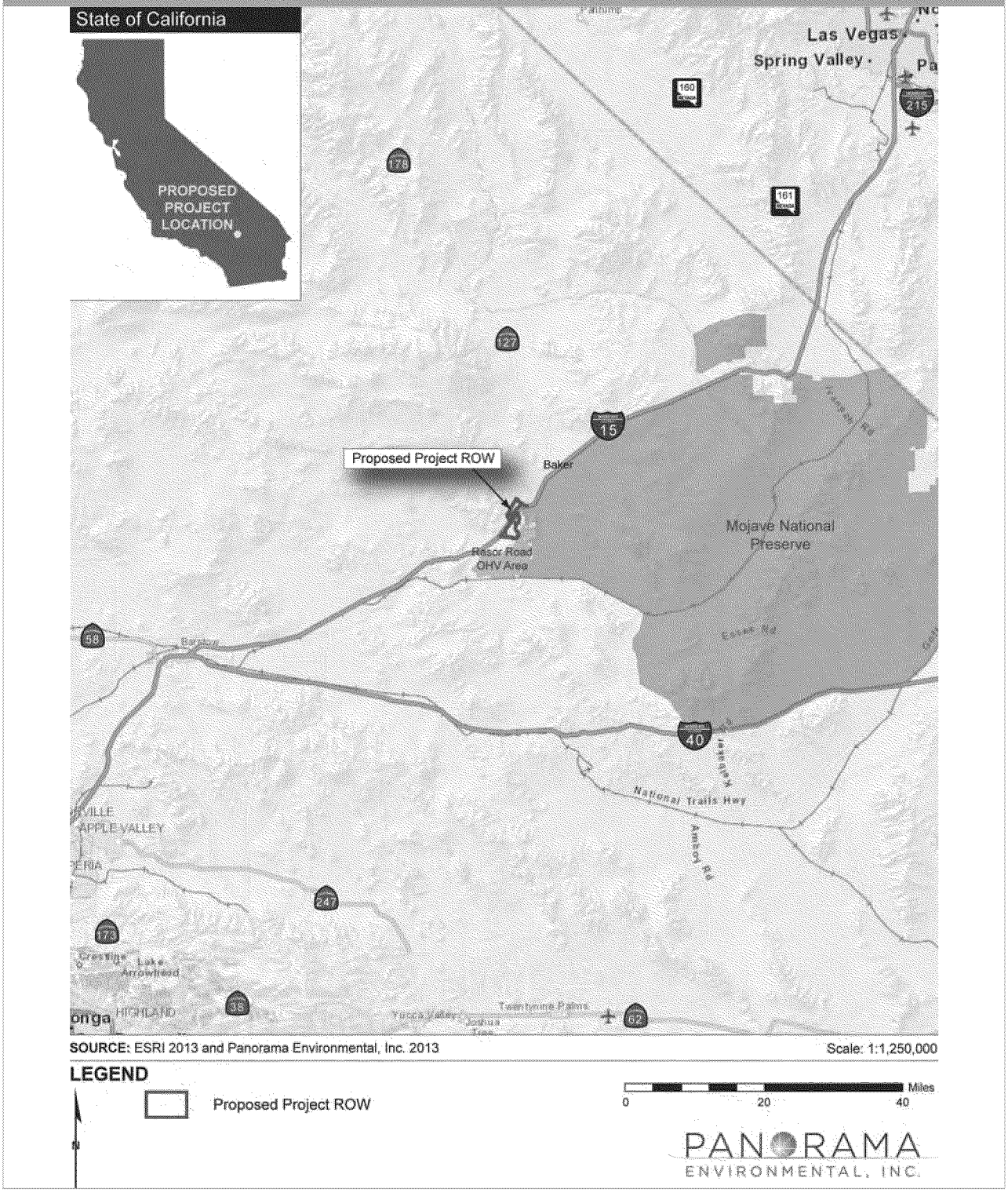
1.3 SENSITIVITY ANALYSIS OBJECTIVES

A sensitivity analysis is commonly performed in mathematical modeling to assess the sensitivity of the model results to individual model parameters. Sensitivity analyses are effective in assessing the robustness of model outcomes in situations where there is uncertainty about the model parameters.

SMS performed a sensitivity analysis using an analytical model to assess the sensitivity of the groundwater model predicted outcome at MC Spring to different values of hydraulic conductivity (and associated recharge). This sensitivity analysis addresses USGS comments regarding the potential overestimation of recharge and hydraulic conductivity by using a wider range including much lower values of recharge and hydraulic conductivity. The objectives of the sensitivity analysis were to:

1. Evaluate the impact of a larger range of values for recharge (R) and hydraulic conductivity (K) on the model outcomes at MC Spring
2. Expand the model domain to include MC Spring
3. Provide a conservative estimate of potential impacts in the Zzyzx area by assuming permeability in the mountain bedrock is equivalent to the permeability of the basin fill sediments

Figure 1.1-1: Project Location



2 GROUNDWATER MODELS

2.1 CONCEPTUAL MODEL

A conceptual model, as used in the analysis presented herein, is a written and/or illustrative (i.e., qualitative) description of an aquifer. The conceptual model for the project describes the physical characteristics of the aquifer that control the flow of groundwater in the Soda Mountain Valley and is based on knowledge of site geology and hydrogeology, as well as established concepts of groundwater flow and geology (e.g., effects of fractures, faulting, and topography on groundwater flow regimes). The conceptual site model is a dynamic model that is adapted and refined as additional data on site aquifer characteristics are collected. The conceptual model supports scientific and technical decisions for the site.

2.1.1 Geology and Hydrogeology

The project area is located within a valley that is mostly separated from the Soda Lake groundwater basin to the east by low-permeability volcanic and granitic bedrock. Inflow to the basin consists of recharge from precipitation. Groundwater inflow from other basins is expected to be minimal due to the presence of low-permeability bedrock surrounding the basin to the north and west. Groundwater flows out of the basin to the Soda Lake groundwater basin at two locations:

1. East of the proposed North Array at the approximate location where I-15 traverses through the mountains
2. East of the southeast corner of the proposed South Array

The conceptual model was developed using geologic mapping, groundwater data from other wells in the region, topographic data, and geophysical data from three locations in the project area (TerraPhysics 2010). Groundwater is present in an unconfined, alluvial aquifer. The alluvium is underlain by bedrock. Geophysical data indicate that groundwater is present approximately 150 to 300 feet below ground surface (bgs) and bedrock is present approximately 350 to 500 feet bgs throughout much of the valley and thins on the valley sides as bedrock elevation rises. Groundwater elevations in the Soda Mountain Valley are approximately 200 to 300 feet higher than groundwater elevations at Soda Lake, indicating the presence of low-permeability bedrock. Flow through the bedrock is expected to be minimal relative to flow through the more permeable basin-fill sediments.

2.1.2 Assumptions and Potential Limitations of Conceptual Model

The conceptual model assumes:

- The only input to groundwater is recharge from rainfall

- There is no permeability or flow through the bedrock into or out of the basin

The Soda Mountain Valley is generally separated from the rest of the Soda Lake groundwater basin by mountains to the south and east. The higher topographic and groundwater elevations in the valley relative to the rest of the basin indicate that there is no groundwater flow from the larger groundwater basin into the Soda Mountain Valley aquifer. The aquifer is, for the most part, physically separated from the Soda Lake groundwater basin by mountains that surround the valley and by higher groundwater elevations. Therefore, the sole input to groundwater recharge is rainfall.

Geologic mapping of the basin shows faulting in the north-south direction east of the proposed North Array. NPS asserts that there may be a preferential flow path along the west margin of the Soda Lake playa. Any flow through fractures in the bedrock is considered to be minimal and was not considered as a source of water to the Soda Mountain Valley nor to MC Spring at Zzyzx in the conceptual model.

2.2 NUMERICAL MODEL

A numerical model is a quantitative representation of the flow regime within an aquifer that is used to simulate and predict aquifer conditions. It provides quantitative predictions of how an aquifer will respond to a specific scenario (e.g., groundwater withdrawal at a given extraction rate). The model predictions are generated using groundwater flow equations based on the physics of groundwater flow. Numerical models are more robust when they use site-specific aquifer parameters as input parameters. The conceptual model is one of the sources used to develop the parameters for the numerical model.

A three-dimensional groundwater flow model was used to simulate groundwater conditions under steady-state and pumping scenarios. The numerical model used a single layer representing an unconfined aquifer. The results of the geophysical survey suggest that the entire thickness of unconsolidated sediments below the water table can be considered a single hydrologic unit, justifying the use of a single-layer model. No significant low-permeability layers such as clays or caliche units were found below the water table, based on geophysical survey results.

2.2.1 Model Inputs

Table 2.2-1 summarizes the selected aquifer parameters used in the numerical groundwater model.

Table 2.2-1: Selected Aquifer Parameters Used in Numerical Groundwater Model

Parameter Set Name	Hydraulic Conductivity (K) (ft/day)	Groundwater Recharge (R) (inches/year)	Storage Coefficient (unitless)
High End	3.2	0.4	0.1
Low End	0.86	0.12	0.1

Note: Values given are for main body of model domain. Nodes at the model boundaries have higher R values. Nodes near the northeast and southeast outlets have higher K values.

2.2.2 Results

The effects of pumping one or three water supply wells at the rate needed for construction and operation were evaluated by conducting transient flow simulations. Transient flow simulations take into account the change in hydraulic heads over time in a dynamic condition of pumping, where the cone of depression spreads downward and outward over time. Simulations were conducted using calibrated high-end and low-end values. The model grid spacing was refined in the vicinity of a simulated well to as small as 1 foot so that a more accurate estimate of drawdown in the well itself could be obtained. Drawdown data generated by the model at three potential well locations (PW-1, PW-2, and PW-3; Figure 2.2-1) are presented in Table 2.2-2.

Table 2.2-2: Summary of Modeling Results at Each Simulated Well[1]

Scenario	Predicted Drawdown Near PW-1 (ft)	Predicted Drawdown Near PW-2 (ft)	Predicted Drawdown Near PW-3 (ft)
3 Wells, 3 Years, High End	28	20	25
3 Wells, 30 Years, High End	5	4	5
3 Wells, 3 Years, Low End	110	68	91
3 Wells, 30 Years, Low End	16	12	15
1 Well, 3 Years, High End	N/A[2]	N/A	80
1 Well, 30 Years, High End	N/A	N/A	13
1 Well, 3 Years, Low End	N/A	N/A	Dry
1 Well, 30 Years, Low End	N/A	N/A	Not Modeled

Notes:

[1] Model predicts declines in hydraulic head and does not account for well loss (head losses due to friction flowing through the well screen). Actual drawdown in the well is expected to be greater due to well loss.

[2] "N/A" indicates the well was not included in the single-well scenario.

The results of the modeling show that it is possible to extract groundwater at the rate needed to supply the project using three wells with low-end conductivity and recharge and using one well with high-end recharge and conductivity.

The model-predicted declines in groundwater were used to extrapolate the predicted reduction in outflow from the valley. The model-predicted decline in water levels at the valley outlets were less than 1 foot in all scenarios. The estimated reduction in outflow out of the northeast outlet is presented in Table 2.2-3.

Figure 2.2-1: Potential Well Locations

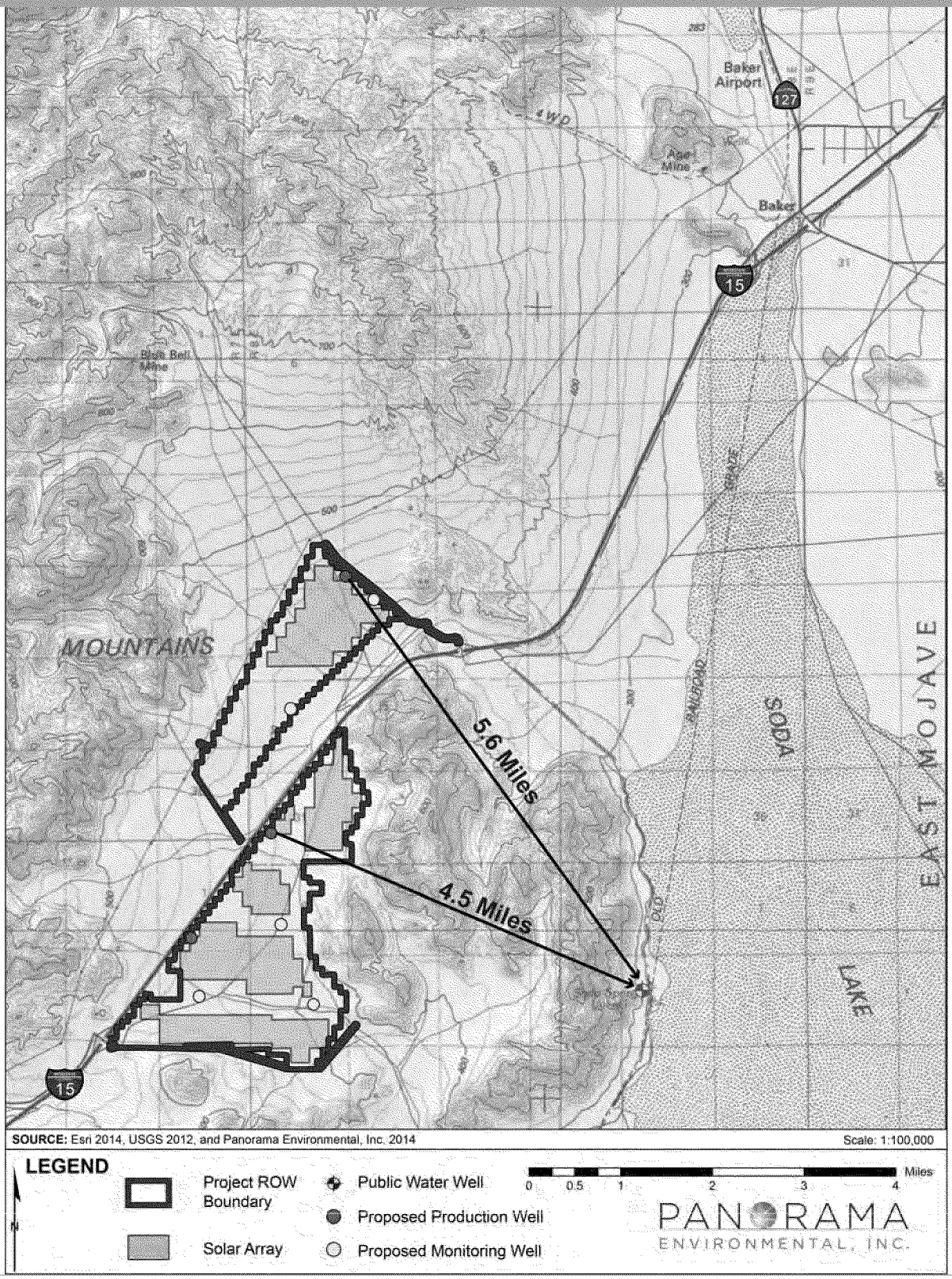


Table 2.2-3: Groundwater Discharge at Northeast Outlet of Soda Mountain Valley				
Model Scenario	**Discharge (AFY) After 3 Years**	**Reduction (AFY)**	**Discharge (AFY) After 30 Years**	**Reduction (AFY)**
High Recharge, Current Conditions	**424.8**	**N/A**	**424.8**	**N/A**
High Recharge, 3 Wells	422.2	2.6	420.2	4.6
High Recharge, 1 Well	424.8	ND	424.3	0.5
Low Recharge, Current Conditions	**121.2**	**N/A**	**121.2**	**N/A**
Low Recharge, 3 Wells	121.2	ND	118.9	2.3
Notes: N/A= Not Applicable; there is no reduction in outflow for the calibrated model of current conditions ND = Not detectable; no change from existing conditions was measured by the model				

The estimated reduction of outflow of 2.3 to 4.6 AFY is less than 2 percent of current outflow (121 AFY) for the low-recharge scenario and approximately 1 percent of the high-recharge scenario (425 AFY). The potential reduction in outflow from the valley over 30 years of water use is not measurable relative to uncertainty in the model and existing variability.

2.2.3 Assumptions and Potential Limitations of Numerical Model

Model assumptions and a brief discussion of the limitations for each assumption are presented in Table 2.2-4.

Table 2.2-4: Numerical Model Assumptions and Limitations	
Model Assumption	**Limitation**
The model domain includes the Soda Mountain Valley and does not extend to Soda Lake	Impacts to MC Spring at Zzyzx cannot be directly measured because MC Spring is not included in the model domain. Instead the model evaluates if drawdown is significant at the edges of the valley.
A no-flow boundary was assigned to the Soda Mountains east of the project area	The model does not include any flow through the Soda Mountains. Geologic maps indicate the mountains are composed of crystalline bedrock; no major faults are known to exist there, and hydraulic conductivity is likely to be extremely low.
Recharge is assumed to be 3 to 10 percent of rainfall	The recharge and hydraulic conductivity in the valley may not be reflected in the model range.
The storage coefficient is 0.1 in all scenarios	The model may not reflect the actual volume of water in storage. However the storage coefficient used is at the conservative (low) end of the range of typical values.
The aquifer is assumed to be unconfined and homogeneous	Variability in the hydraulic conductivity is not reflected in the model. However, a large range of values thought to encompass a reasonable range of values (based on borehole and geophysical data) was used.

The numerical model was constructed using geophysical data collected in the valley. No groundwater wells have been constructed within the Soda Mountain Valley and therefore model values for hydraulic conductivity, storage coefficient, depth to groundwater, and thickness of saturated alluvium have not yet been confirmed by direct field measurement. A range of conductivity values was used in the model to account for the expected range of recharge in the valley aquifer. USGS commented that the low-end recharge and conductivity values are too high for the Soda Mountain area based on recharge rates from the Death Valley regional flow system (Hevesi et al. 2003).

3 ANALYTICAL MODEL SENSITIVITY ANALYSIS

3.1 METHODOLOGY

A sensitivity analysis was conducted using the Theis method (Theis 1935) to test the sensitivity of the predicted outcome at MC Spring to variations in hydraulic conductivity. The Theis equation is a two-dimensional model of groundwater flow to a point source in an infinite, homogeneous aquifer. It is used in hydrogeology to predict groundwater level (unconfined aquifer) or hydraulic head (confined aquifer) declines at distances from a pumping well.

The Theis equation was not adjusted for the presence of lower-permeability bedrock in the mountains east of the Soda Mountain Valley. The model therefore provides a conservative estimate of groundwater declines on the east side of the Soda Mountains by assuming that the geologic unit within the Soda Mountains is as permeable as the basin fill in the Soda Mountain Valley, and that groundwater declines will radiate outward at the same rate within the mountain bedrock as within the basin fill.[1] This is an extremely conservative assumption because the Soda Mountains are composed of granitic rocks that are impermeable except for limited fractures.

Hydraulic conductivity and recharge values used in the sensitivity analysis are presented in Table 3.1-1. The low-end value represents a recharge rate of 0.6 percent of rainfall and the high-end value represents a recharge rate of 50 percent of rainfall. The low-end value of 0.6 percent is identical to the low-end value for recharge that was suggested by USGS and is based on a value for the hydrologically similar Valjean Valley. The high-end value is about two orders of magnitude (83 times) higher than the low-end value. This wide range of values allows for an assessment of whether the model outcome is affected by vastly different values of hydraulic conductivity.

The proposed wells would be located in a valley that is underlain by an alluvial aquifer. Alluvium covers an area of approximately 12,632 acres within the valley. The storage coefficient is assumed to be 0.1, identical to that used for the numerical model, and a reasonable and

[1] The Theis method also provides a conservative assessment of drawdown in the Town of Baker. Baker is farther from the project area than MC Spring and impacts are predicted to be even less at a farther distance from the wells.

Table 3.1-1: Recharge and Conductivity Values Used in Sensitivity Analysis

Parameter Value Set	Hydraulic Conductivity (feet/day)	Groundwater Recharge (inches/year)
Original Low-End	0.86	0.12
New Low-End	0.17	0.024
Original High-End	3.2	0.4
New High-End	16	2

conservative value to use for unconfined aquifers, which typically have storage coefficients between 0.1 and 0.3 (Lohman 1972).

Total water demand used in the model over the maximum 3-year construction period was estimated to be approximately 576 acre-feet (AF) (192 AFY over 3 years). Total water demand over the 30-year operational period was estimated to be approximately 990 AF (33 AFY over 30 years).

3.2 RESULTS

The results of the sensitivity analysis are presented in Table 3.2-1. Detailed calculations are presented in Appendix A. The maximum estimated drawdown at MC Spring is 0.061 feet under the high-end scenario. The maximum estimated drawdown at MC Spring is 0.0015 feet under the low-end scenario, and would be at the limit of detection. The impact at MC Spring decreases in proportion to the reduction in recharge and conductivity. If recharge and conductivity in the Soda Mountains were less than the low-end values used in this sensitivity analysis, the potential for impact at MC Spring would be even less.

Table 3.2-1: Sensitivity Analysis Results

Hydraulic Conductivity Value (ft/day)		Predicted Drawdown at MC Spring (ft) after 3 Years of Construction	Predicted Drawdown at MC-Spring (ft) after 30 Years of Operation	Total Predicted Drawdown at MC Spring (ft)
Original Low End	0.86	<0.00025	<0.000044	<0.00029
New Low End	0.17	<<0.0013	<<0.00022	<<0.0015
Original High End	3.2	<0.000068	0.0037	0.0037
New High End	16	<0.000043	0.061	0.061
	Range	**<0.000043 to <<0.0013**	**<<0.00022 to 0.061**	**<<0.0015 to 0.061**

Notes:

The well function (W(u)) for the Theis equation was approximated using published tables for values of *u* (dimensionless time parameter). Where there was no exact value of *u*, < indicates that the value is lower than the value *u* and << indicates that the value is much lower than the nearest value of *u* available. See Appendix A for details.

3.3 SUMMARY

The results of the sensitivity analysis indicate that the potential impacts at MC Spring are not sensitive to variations in hydraulic conductivity and recharge. The project is not likely to affect MC Spring given any range of values of hydraulic conductivity and recharge because (1) there is approximately 4.5 miles between the nearest proposed project well and MC Spring, (2) the duration of construction, during which water use will be high, is only 3 years (maximum), and (3) the proposed volume of water to be used during the 30-year operational period (33 AFY) is small relative to the volume of water in storage and the distance to MC Spring.

The model results are very conservative because the model approach assumed that the bedrock separating the Soda Mountain Valley from MC Spring was as permeable as the basin fill. The predicted reduction in groundwater flow and groundwater levels at MC Spring were minimal under all modeled scenarios and demonstrate that the project will not affect the Mohave tui chub because the small potential reduction in water surface elevation (conservatively predicted at a maximum of 0.061 feet, which is less than 1/10 of 1 foot) will not adversely impact Mohave tui chub habitat suitability.

The sensitivity analysis results demonstrate that the proposed groundwater well test results will not change the analysis of impacts at MC Spring. The information provided in this report and in previous modeling reports provide evidence of the limited potential for impact at MC Spring.

SMS has also developed a Groundwater Monitoring and Mitigation Plan that includes the following measures to ensure impacts to MC Spring would not occur as a result of project groundwater withdrawal:

- **Groundwater monitoring within Soda Mountain Valley:** SMS will implement a groundwater monitoring program within the Soda Mountain Valley that will serve as an early warning system. If drawdown at the monitoring wells exceeds predicted values by 20 percent or more, the groundwater model will need to be recalibrated. If the recalibrated model predicts that outflow from the valley would decrease by more than 20 percent from existing conditions, SMS will need to curtail pumping to a safe extraction rate.
- **Groundwater monitoring at MC Spring:** Implementation of a groundwater monitoring program at MC Spring would allow for identification of drawdown effects at the spring. The monitoring program would involve collection of background water level data at the spring to provide information on static, non-pumping conditions. Background data would also provide information on the magnitude of water level variations that occur in the spring under normal conditions. After pumping is initiated the spring would continue to be monitored for changes in water levels. Water level data would be regularly analyzed by a qualified professional hydrologist or hydrogeologist to identify if project groundwater pumping is adversely affecting the spring.
- **Groundwater extraction activities assessment and revision:** The groundwater extraction activities being performed at the project site would be evaluated and possibly revised to minimize effects to the spring if the action thresholds at monitoring wells in

the valley and at the spring are triggered. This may involve discontinuation of or reduced use of wells that may have an effect on spring water levels (i.e., those closer to the eastern project boundary).

4 REFERENCES

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Appendix A: Drawdown Calculations

Objective: Calculate potential drawdown at the Desert Studies Center due to pumping for the proposed Soda Mountain Solar project, assuming there are no hydraulic barriers from the Soda Mountains that form the eastern flank of Soda Mountain Valley.

Approach: Use Theis solution (Theis 1935) to calculate drawdown over time and distance, with assumption of uniform hydraulic conductivity and infinite aquifer (no hydraulic boundaries).

Drawdown ($h_o - h$) can be calculated using the Theis Equation:

$$h_o - h = \frac{Q}{4\pi T} W(u)$$

where h_o is the head at time t=0, h is the head at time t, Q is the pumping rate, and T is the transmissivity. The transmissivity is calculated using the following approximation that assumes uniform aquifer thickness and uniform horizontal conductivity:

$$T = Kb$$

where K is the hydraulic conductivity and b is the aquifer saturated thickness. The well function $W(u)$ can be approximated using published tables of values for values of u, which are calculated according to the following equation:

$$u = \frac{r^2 S}{4Tt}$$

where r is the distance to the closest well and S is the storage coefficient.

S = 0.1 (TRC 2013; typical value)

r = 4.5 miles (closest distance from production well to Desert Studies Center)

b = 100 ft (approximate at well location, based on geophysical measurements)

Q_1 = 192 AFY for t = 3 yrs

Q_2 = 33 AFY for t = 30 yrs

Calculations were performed using two different transmissivities, reflecting the upper and lower estimates for the hydraulic conductivity:

K_1 = 3.2 ft/d

K_2 = 0.86 ft/d

High-end K Case: Let K_1 = 3.2 ft/d

$$T_1 = K_1 b = (3.2\,\text{ft/d})(100\,\text{ft}) = 320\,\text{ft}^2/\text{d}$$

Q_1 = 192 AFY = 22,914 ft^3/d for t_1 = 3 yrs

$$u = \frac{r^2 S}{4T_1 t_1} = \frac{[(4.5\text{miles})(5280\text{ft/mile})]^2 * 0.10}{(4)(320\,\text{ft}^2/\text{d})(3\text{yrs})(365\text{d/yr})} = 40.3$$

$W(u) < 0.000012$ (Table 8.1, Freeze & Cherry, 1979, p318)

$$h_o - h = \frac{Q}{4\pi T} W(u) = \frac{22{,}914\,\text{ft}^3/\text{d}}{(4)(\pi)(320\,\text{ft}^2/\text{d})} * (< 0.000012)$$

$$h_o - h < 0.000068\,\text{ft}$$

Q_2 = 33 AFY = 3,938 ft^3/d for t_2 = 30 yrs

$$u = \frac{r^2 S}{4T_2 t_2} = \frac{[(4.5\text{miles})(5280\text{ft/mile})]^2 * 0.10}{(4)(320\,\text{ft}^2/\text{d})(30\text{yrs})(365\text{d/yr})} = 4.03$$

$W(u) = 0.0038$ (Table 8.1, Freeze & Cherry, 1979, p318)

$$h_o - h = \frac{Q}{4\pi T} W(u) = \frac{3{,}938\,\text{ft}^3/\text{d}}{(4)(\pi)(320\,\text{ft}^2/\text{d})} * (0.0038)$$

$$h_o - h = 0.0037\,\text{ft}$$

Total drawdown = drawdown after t_1 = 3 yrs + drawdown after t_2 = 30 years

= <0.000068 ft + 0.0037 ft

Total possible drawdown = 0.0037 ft

Low-end K Case: Let K_2 = 0.86 ft/d

$$T_2 = K_2 b = (0.86\,\text{ft/d})(100\,\text{ft}) = 86\,\text{ft}^2/\text{d}$$

Q_1 = 192 AFY = 22,914 ft^3/d for t_1 = 3 yrs

$$u = \frac{r^2 S}{4T_2 t_1} = \frac{[(4.5\text{miles})(5280\text{ft/mile})]^2 * 0.10}{(4)(86\,\text{ft}^2/\text{d})(3\text{yrs})(365\text{d/yr})} = 150$$

$W(u) < 0.000012$ (Table 8.1, Freeze & Cherry, 1979, p 318)

$$h_o - h = \frac{Q}{4\pi T} W(u) = \frac{22{,}914\,\text{ft}^3/\text{d}}{(4)(\pi)(86\,\text{ft}^2/\text{d})} * (< 0.000012)$$

$$h_o - h < 0.00025\,\text{ft}$$

Q_2 = 33 AFY = 3,938 ft^3/d for t_2 = 30 yrs

$$u = \frac{r^2 S}{4T_2 t_2} = \frac{[(4.5\text{miles})(5280\text{ft/mile})]^2 * 0.10}{(4)(86\,\text{ft}^2/\text{d})(30\text{yrs})(365\text{d/yr})} = 14.98$$

$W(u) < 0.000012$ (Table 8.1, Freeze & Cherry, 1979, p318)

$$h_o - h = \frac{Q}{4\pi T} W(u) = \frac{3{,}938\,\text{ft}^3/\text{d}}{(4)(\pi)(86\,\text{ft}^2/\text{d})} * (0.0038)$$

$$h_o - h < 0.000044\,\text{ft}$$

Total drawdown = drawdown after t_1 = 3 yrs + drawdown after t_2 = 30 years

= <0.00025 ft + <0.000044 ft

Total possible drawdown < 0.00029 ft

Sensitivity Testing - Extreme Ends of K Range Analysis

Assume for the Highest-end Case K = 5 times the High-end Case K, and for the Lowest-end Case, K = 1/5 of the Low-end K value.

Highest-end K: Let K = 5 x 3.2 ft/d = 16 ft/d

$$T_2 = K_2 b = (16\ \text{ft/d})(100\ \text{ft}) = 1600\ \text{ft}^2/\text{d}$$

Q_1 = 192 AFY = 22,914 ft^3/d for t_1 = 3 yrs

$$u = \frac{r^2 S}{4T_2 t_1} = \frac{[(4.5\text{miles})(5280\text{ft/mile})]^2 * 0.10}{(4)(1600\,\text{ft}^2/\text{d})(3\text{yrs})(365\text{d/yr})} = 8.05$$

$$W(u) = 0.000038 \text{ (Table 8.1, Freeze \& Cherry, 1979, p 318)}$$

$$h_o - h = \frac{Q}{4\pi T} W(u) = \frac{22{,}914\,\text{ft}^3/\text{d}}{(4)(\pi)(1600\,\text{ft}^2/\text{d})} * (0.000038)$$

$$h_o - h = 0.000043\ \text{ft}$$

Q_2 = 33 AFY = 3,938 ft^3/d for t_2 = 30 yrs

$$u = \frac{r^2 S}{4T_2 t_2} = \frac{[(4.5\text{miles})(5280\text{ft/mile})]^2 * 0.10}{(4)(1600\,\text{ft}^2/\text{d})(30\text{yrs})(365\text{d/yr})} = 0.81$$

$$W(u) < 0.31 \text{ (Table 8.1, Freeze \& Cherry, 1979, p318)}$$

$$h_o - h = \frac{Q}{4\pi T} W(u) = \frac{3{,}938\,\text{ft}^3/\text{d}}{(4)(\pi)(1600\,\text{ft}^2/\text{d})} * (0.31)$$

$$h_o - h = 0.061\ \text{ft}$$

Total drawdown = drawdown after t_1 = 3 yrs + drawdown after t_2 = 30 years

= <0.000043 ft + <0.061 ft

Total possible drawdown < 0.061 ft

Lowest-end K Case: Let K_4 = 0.17 ft/d

$$T_2 = K_2 b = (0.17\,\text{ft/d})(100\,\text{ft}) = 17\,\text{ft}^2/\text{d}$$

Q_1 = 192 AFY = 22,914 ft^3/d for t_1 = 3 yrs

$$u = \frac{r^2 S}{4T_2 t_1} = \frac{[(4.5\text{miles})(5280\text{ft/mile})]^2 * 0.10}{(4)(17\,\text{ft}^2/\text{d})(3\text{yrs})(365\text{d/yr})} = 758$$

$W(u) \ll 0.000012$ (Table 8.1, Freeze & Cherry, 1979, p 318)

$$h_o - h = \frac{Q}{4\pi T} W(u) = \frac{22{,}914\,\text{ft}^3/\text{d}}{(4)(\pi)(17\,\text{ft}^2/\text{d})} * (\ll 0.000012)$$

$$h_o - h \ll 0.0013\,\text{ft}$$

Q_2 = 33 AFY = 3,938 ft^3/d for t_2 = 30 yrs

$$u = \frac{r^2 S}{4T_2 t_2} = \frac{[(4.5\text{miles})(5280\text{ft/mile})]^2 * 0.10}{(4)(17\,\text{ft}^2/\text{d})(30\text{yrs})(365\text{d/yr})} = 75.8$$

$W(u) \ll 0.000012$ (Table 8.1, Freeze & Cherry, 1979, p318)

$$h_o - h = \frac{Q}{4\pi T} W(u) = \frac{3{,}938\,\text{ft}^3/\text{d}}{(4)(\pi)(17\,\text{ft}^2/\text{d})} * (\ll 0.000012)$$

$$h_o - h \ll 0.00022\,\text{ft}$$

Total drawdown = drawdown after t_1 = 3 yrs + drawdown after t_2 = 30 years

= <<0.0013 ft + <<0.00022 ft

Total possible drawdown << 0.0015 ft

Discussion

The conceptual model for the site is that the Soda Mountains, which form a crystalline intrusive bedrock mass at the eastern wall of the Soda Mountain Valley, serve as a hydraulic barrier to flow of groundwater. Some have proposed that the mountains may be fractured such that pumping effects could be transmitted outside the valley and affect water levels at the DSC. While this contention seems highly unlikely given the low permeability nature of crystalline bedrock compared to that of the sand aquifer in the Soda Mountain Valley, it can be tested readily by assuming the mountains had the same permeability as the sand and gravel aquifer, as if the sand aquifer extended all the way to the DSC and beyond.

The Theis equation can be applied to evaluate the drawdown in a uniform aquifer of infinite extent. It was applied here using projected pumping rates during the life of the project, and drawdown over time and distance was calculated.

At the reasonable upper end of hydraulic conductivity estimates for the aquifer, 3.2 ft/d, the drawdown, calculated based on the assumption of an infinite aquifer with uniform properties, would be approximately 0.004 ft at the distance of 4.5 miles to the DSC after 33 years of pumping. At the lower end of the *K* estimate (0.86 ft/d), the drawdown at the DSC after 33 years of pumping would be less than 0.0003 ft.

Sensitivity testing was conducted by extending the range of *K* values tested, with five times lower and five times higher estimates of *K*. The sensitivity testing showed that even for *K* values that were five times higher and five times lower than what has been selected as a reasonable range, the resulting drawdown calculations indicate that the drawdown at the DSC would be 0.06 feet or less for all *K* values, over the life of the project.

Conclusion:

The results indicate that even if the mountains that form the eastern wall of the valley did not exist, and the aquifer extended without any hydraulic barriers directly to the DSC, the drawdown that would result from pumping over the life of the project would not be reliably measurable (0.06 feet or less) at the DSC.

APPENDIX H-1
Water Supply Assessment

SMSP01273

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SMSP01274



Water Supply Assessment

Soda Mountain Solar Project
San Bernardino County, CA

January 2013

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ENVIRONMENTAL, INC.

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Water Supply Assessment

Soda Mountain Solar Project
San Bernardino County, California

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January 2013

TABLE OF CONTENTS

1 Introduction 1

2 Regulatory Background 4

2.1 State of California 4

2.2 San Bernardino County 5

3 Project Description 6

3.1 Proposed Project 6

3.2 Project Location 6

3.3 Proposed Groundwater Use and Requirements 6

4 Groundwater Basin/Supply 9

4.1 Groundwater Basin 9

4.2 Groundwater Management/Adjudication 15

4.3 Expected Groundwater Quality 16

5 Project Demand Analysis 18

5.1 Existing Uses 18

5.2 Planned Future Uses 18

5.3 Proposed Use 18

6 Groundwater Supply Availability 21

6.1 Single dry-Year 22

6.2 Multiple dry-Year 22

6.3 Dry Year Supply 22

6.4 Dry Year Demand 23

7 Comparison of Projected Water Supply and Demand 25

8 References 26

List of Tables

Table 1: Guide to Water Supply Assessment 1
Table 1 (*Continued*): Guide to Water Supply Assessment 2
Table 1 (*Continued*): Guide to Water Supply Assessment 3
Table 2: Project Water Demand 20

SMSP01277

Table 3: 20-year Project Water Use Projections (acre-feet) 21
Table 4: Precipitation Recharge to Soda Mountains Subbasin 23
Table 5: Groundwater Availability Projections for Years 1 through 3 (Construction)..... 23
Table 6: Groundwater Availability Projections for Years 4 through 20 (Operation)..... 24

List of Figures

Figure 1: Project Location..... 7
Figure 2: Groundwater Basins..... 10
Figure 3: Geologic Map of Soda Mountain Subbasin..... 11
Figure 4: Soda Mountain Precipitation 14
Figure 5: Groundwater Wells..... 17
Figure 6: Well Locations..... 19

1 INTRODUCTION

This Water Supply Assessment (WSA) has been prepared for the proposed Soda Mountain Solar Project (Project) in accordance with the requirements for a WSA provided in the California Water Code §10910. The WSA has been prepared by Soda Mountain Solar, LLC for consideration by San Bernardino County. Soda Mountain Solar, LLC submitted an application for a groundwater well permit to the County in September 2012. The groundwater well permit application was prepared in accordance with §33.06554 of the County Code of Ordinances. The groundwater well permit is a discretionary permit under the California Environmental Quality Act (CEQA).

Table 1 identifies the location of this required information in the WSA. The WSA includes specific groundwater information because the Project will obtain all of its water supply from groundwater. The WSA also addresses:

- Projected water availability for the Project under normal water years, dry water years, and multiple-dry water years (i.e., during droughts)
- Projected water demand for the Project over a 20-year period
- Adequacy of projected supplies to serve existing demand, demand from the project, and demand from planned future uses

Table 1: Guide to Water Supply Assessment

Water Code Section 10910	Page No.
Documenting Groundwater Supply	
(f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment: (1) Review any information contained in the urban water management plan relevant to the identified water supply for the proposed project.	14
(2) Describe any groundwater basin or basins from which the proposed project will be supplied. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current bulletin of the department that characterizes the condition of the groundwater basin, and a detailed description by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.	8 to 13

Table 1 (*Continued*): Guide to Water Supply Assessment	
Water Code Section 10910	**Page No.**
Documenting Groundwater Supply	
(3) Provide a detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.	N/A
(4) Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.	17 to 18
(5) Analyze the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project. A water assessment shall not be required to include the information required by this paragraph if the public water system determines, as part of the review required by paragraph (1), that the sufficiency of groundwater necessary to meet the initial and projected water demand associated with the project was addressed in the description and analysis required by paragraph (4) of subdivision (b) of Section 10631.	24
Documenting Existing Entitlements	
(e) If no water has been received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts, the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall also include in its water supply assessment pursuant to subdivision (c), an identification of the other public water systems or water service contract holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has identified as a source of water supply within its water supply assessments.	10 and 12
Documenting Capacity to Meet Demand During Normal and Dry Water Years and Cumulative Uses	
(c)(3) If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single-dry, and multiple-dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.	17 to 23
Documenting Normal, Dry Year(s), and 20-Year Supply	
(c)(4) If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single-dry, and multiple-dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.	23

Table 1 (*Continued*): Guide to Water Supply Assessment	
Water Code Section 10910	**Page No.**
Is the Projected Water Supply Sufficient or Insufficient for the Proposed Project and Cumulative Uses?	
(c)(5) If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single-dry, and multiple-dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.	24

2 REGULATORY BACKGROUND

2.1 STATE OF CALIFORNIA

California groundwater law provides an overlying landowner or groundwater appropriator the right to pump and use local groundwater for reasonable and beneficial uses. The State of California does not have a permit process for regulation of groundwater use; however groundwater rights may be adjudicated by court decree. The groundwater rights within the groundwater basin underlying the Project area have not been adjudicated, and are considered available for use. Groundwater use is considered an overlying use if pumped for use on the parcel where the water is pumped. Groundwater use is appropriative if the appropriator pumps and delivers water for use off of the parcel where the water is pumped. Generally, overlying landowners have priority. An appropriative user, however, may put "surplus" groundwater to beneficial use. "Surplus" groundwater is water available under natural conditions on an average annual basis in an amount greater than average annual demand. Use of groundwater for the proposed Project would be considered overlying, and available for use on the parcels above the aquifer. The Project would pump water for reasonable and beneficial uses, including construction and operation uses.

Senate Bill (SB) 901 was enacted in 1995 to ensure that cities and counties assess the adequacy of available water supplies to meet projected water demand prior to approving certain types of new land development projects. SB 901, also known as the WSA law, requires that before a project is granted approval, the city or county must request preparation of a WSA by the public water supplier that will serve the proposed project. The provisions of SB 901 were codified in Water Code §10910 through §10915.

SB 610 was enacted in 2001 to improve the WSA process and expand the scope of development projects triggering the WSA procedure. The primary goal of SB 610 was to improve the linkage between water use and land use planning to ensure that land use decisions for specific large development projects have adequate information to assess whether sufficient water supplies are available to meet project demands. The 2001 bill also required additional information with respect to groundwater supplies. In 2011, SB 267 was enacted to revise the definition of a project to include new renewable energy projects. Section 10912(a)(7)(B) of the Water Code specifies that a proposed photovoltaic generation facility is not a "project" subject to the provisions of SB 610 if the facility would demand no more than 75 acre-feet of water annually.

The operational water demand for the Soda Mountain Solar Project is 7 acre-feet per year (AFY). The construction water demand of the Soda Mountain Solar Project is 192 AFY for three years. Because the annualized water demand of the Soda Mountain Solar Project is approximately 26 AFY over 30 years, it demands less than 75 acre-feet of water annually and is not subject to the

provisions of SB 610. This WSA has nonetheless been prepared to assist the BLM and San Bernardino County in the evaluation of Project water supply impacts under the National Environmental Policy Act and the California Environmental Policy Act.

2.2 SAN BERNARDINO COUNTY

Water resources within San Bernardino County are subject to the San Bernardino County Groundwater Management Ordinance (Ordinance, Article 5, §33.06554). The County's Groundwater Management Ordinance requires a well permit application to be filed for the use of groundwater. The County has discretionary authority to issue the groundwater well permit. In issuing a permit, the County must find, "based upon the available data, the well(s) constructed and operated as proposed, would not result in exceeding the groundwater safe yield of the relevant aquifers." (*Id.*) The County may include in the permit "conditions and requirements" found to be "reasonably necessary to accomplish the purposes of [the Ordinance], including . . . conditions requiring groundwater management, mitigation and monitoring by the applicant." (*Id.*)

3 PROJECT DESCRIPTION

3.1 PROPOSED PROJECT

The Project consists of a 350-megawatt (MW) photovoltaic (PV) solar generating facility located within an approximately 4,500-acre right-of-way (ROW) on U.S. Bureau of Land Management (BLM) administered land. The majority of the ROW will be occupied by solar array fields and the remaining area will be used for stormwater control, access roads, ancillary buildings, and reserve land. One or more groundwater supply wells are proposed to supply water for the Project. Project construction is estimated to require approximately 192 acre-feet per year (AFY) of water over the 3-year construction period. Project operation is estimated to require approximately 7 AFY of water during the operation of the Project.

3.2 PROJECT LOCATION

The Project is located approximately 6 miles southwest of Baker, California, along Interstate 15 (I-15). The site location and neighboring terrain are presented on Figure 1. The north array is accessible from Zzyzx Road. The south and east arrays are accessible from Rasor Road.

The Project lies within an intermontane desert valley composed of alluvial fan deposits and surrounded by the Soda Mountains. Elevations in the Project area range from approximately 1,550 feet in the north to 1,250 feet in the southeast. The Soda Mountains north and west of the Project area reach an elevation of approximately 3,600 feet. Lower mountains to the south and east of the Project area form a discontinuous border reaching elevations of approximately 2,400 feet.

3.3 PROPOSED GROUNDWATER USE AND REQUIREMENTS

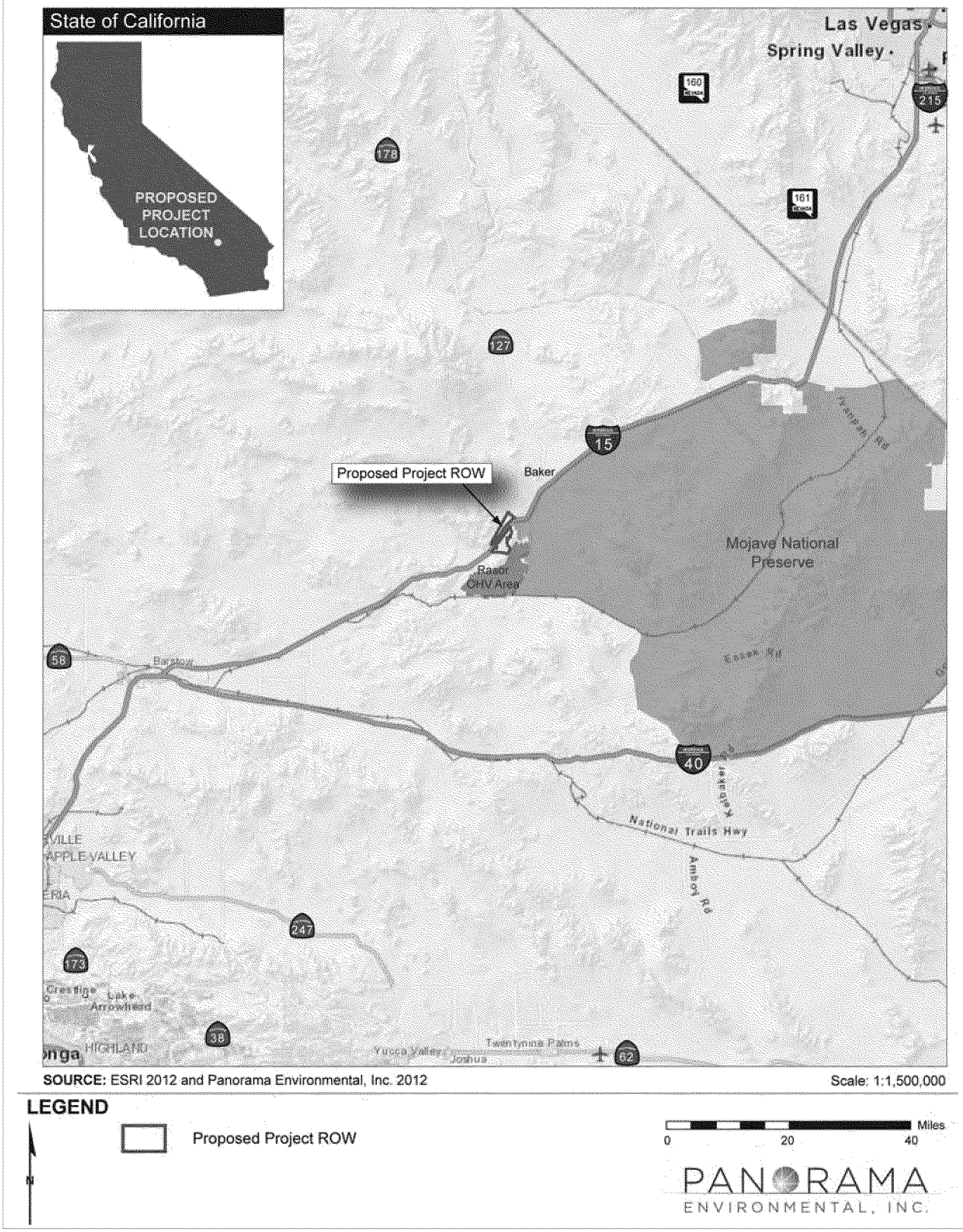
3.3.1 Project Construction

Groundwater will be used for dust control and soil compaction during Project construction. Construction will occur continuously for a period of about 3 years. Water will also be pumped and stored for fire protection. Groundwater will be extracted continuously over this 3-year period at an estimated average rate of 200,000 gallons per day (gpd) (192 AFY[1]) with periodic peak use at an estimated rate of 300,000 gpd.

[1] Water use is estimated to be up to 6 days per week during the period of construction.

SMSP01284

Figure 1: Project Location



3.3.2 Project Operation

Groundwater will be used primarily for PV panel washing during the Project operation phase. Panel washing will be conducted once or twice per year over an estimated 21-day period and will require 5.4 AFY (41,895 gallons per day for 42days). Other water needs during Project operation will include fire suppression and, possibly, potable water supply for the operations and maintenance building. A 22,500-gallon water tank will be maintained on site for fire suppression and will periodically be refilled as needed (i.e., at irregular intervals) during Project operation. Potable water needs are estimated at 1.5 AFY (1,339 gallons per day for 365 days). Assuming that panel washing will occur twice per year, approximately 7 AFY will be extracted from the site water supply wells during Project operation.

4 GROUNDWATER BASIN/SUPPLY

The primary source of water for the Project would be groundwater from the aquifer underlying the Project area. This section provides a description of the groundwater basin including groundwater supply and availability.

4.1 GROUNDWATER BASIN

4.1.1 Soda Lake Valley Groundwater Basin

The 381,000-acre Soda Lake Valley Groundwater Basin (Basin No. 6-33; California Department of Water Resources [DWR] 2004) is located in a valley in northeast San Bernardino County (Figure 2). The basin is bounded by the non-water-bearing Mark and Kelso Mountains on the east, the Bristol and Cady Mountains on the south, the Soda and Cave Mountains on the west, and a low divide with the Silver Lake Basin on the north. These areas drain towards Soda Dry Lake (DWR 2004). Annual precipitation in the valley ranges from 3 to 5 inches. The Project ROW is located in the west portion of the basin, surrounded by the Soda Mountains.

4.1.2 Soda Mountains Subbasin

The Project is located within a subbasin of the Soda Lake Valley Groundwater Basin. The subbasin is generally separated from the rest of Basin No. 6-33 by mountains to the south and east. The direction of groundwater flow within the subbasin is expected to generally mimic surface water flow. Surface water from the South Array area flows to the southeast and the North and East arrays drain to the northeast. Groundwater flow in the northeast portion of the subbasin is expected to be toward the Town of Baker to the northeast and Soda Lake to the east. Groundwater flow in the southwest portion of the subbasin is expected to be toward the terminus of the Mojave wash to the southeast.

Geologic mapping indicates that the alluvium in the subbasin is surrounded by volcanic and granitic geologic units (Figure 3). These geologic units are impermeable, although fractures may allow some limited groundwater permeability (Dubois 2012). Because the subbasin is surrounded by mountains, groundwater is likely funneled to Basin No. 6-33 through small breaks in the mountains to the east and south. It is hypothesized that there is interbasin flow throughout the historic Great Basin, though it does not occur uniformly between all basins (Belcher et al. 2009).

Figure 2: Groundwater Basins



SOURCE: ESRI 2012, CA Department of Water Resources 2003, and Panorama Environmental, Inc. 2012

Scale: 1:500,000

LEGEND

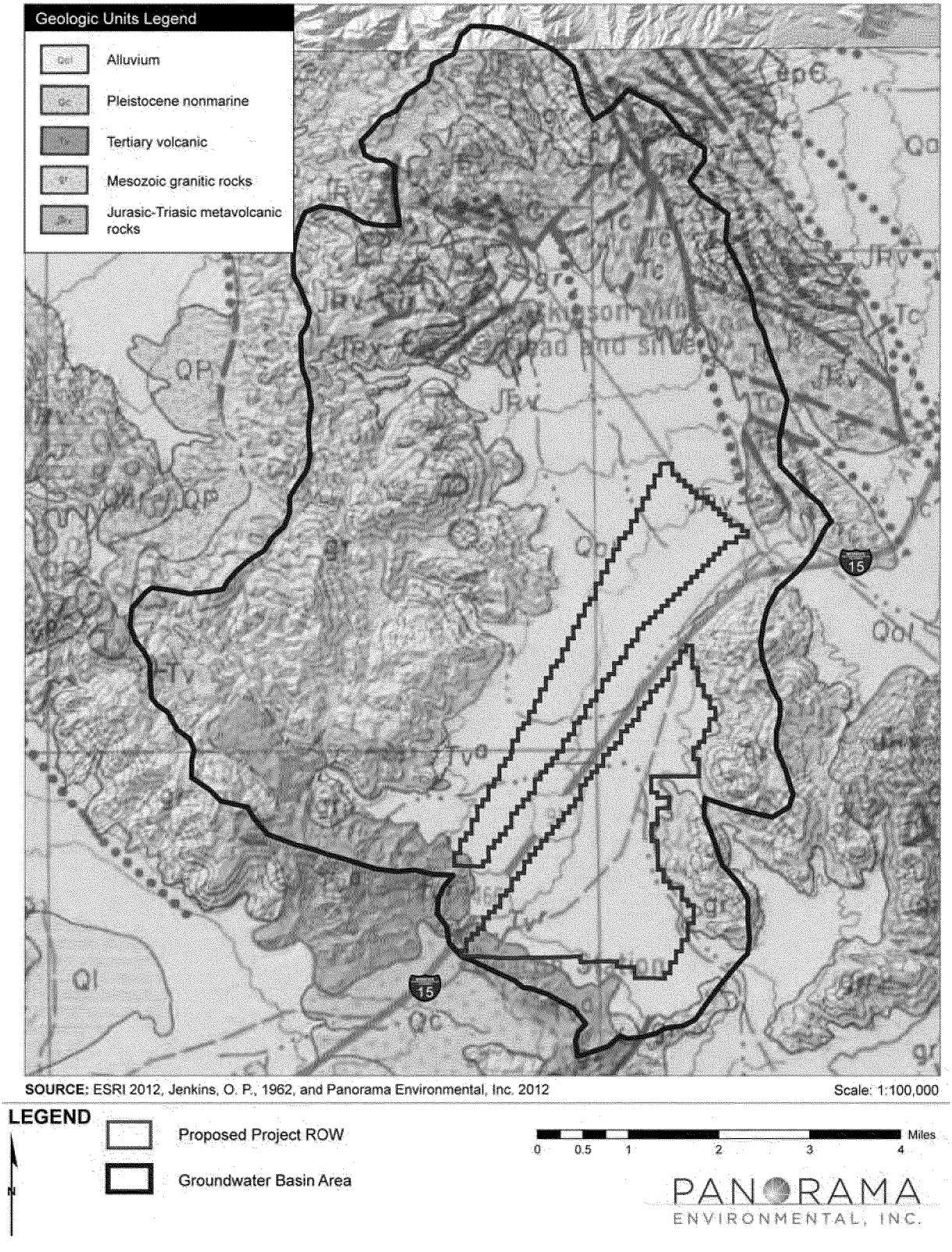
- Proposed Project ROW
- Proposed Project Groundwater Basin Area
- Soda Lake Valley Groundwater Basin

N

0 2.5 5 10 15 20 Miles

PANORAMA ENVIRONMENTAL, INC.

Figure 3: Geologic Map of Soda Mountain Subbasin



The subbasin is topographically higher than areas to the east (RMT 2011). Groundwater elevations within the subbasin estimated from geophysical data (Terraphysics 2010 in Wilson Geosciences 2011) are approximately 150 to 300 feet higher than those measured by the U.S. Geological Survey (USGS) in Basin No. 6-33. Specifically, the estimated depth to groundwater for the project area is 1,232 to 1,170 feet amsl in the subbasin while groundwater levels outside the subbasin measured by USGS at wells located on Rasor Road in Basin No. 6-33 range from 945 feet to 958 feet (USGS wells #012N008E35A; 012N008E27N). Similarly, Zzyzx spring is located on the bank of Soda Lake within Basin No. 6-33 at an elevation of approximately 948 feet.

The largely impermeable volcanic and granitic geologic mountains surrounding the subbasin and its higher topographic and groundwater elevations indicate that the Soda Mountains subbasin is a physically distinct basin within the larger Basin No. 6-33. The outer boundaries of the two watersheds identified in the project area further support this conclusion because they mirror the subbasin boundary, consistent with the principle that surface water drainage divides generally represent groundwater divides (*see,* Soda Mountain Solar Project Plan of Development 2011).This separation indicates that the groundwater resources within the subbasin should be analyzed separately from those within Basin No. 6-33. Working from the smaller subbasin also yields a more conservative safe-yield estimate, particularly since the project would not be able to draw groundwater resources from the larger Soda Lake Basin (Basin No. 6-33) due to its lower elevation and separation by impermeable rocks.

Aquifer Geology

The subbasin is approximately 32,946 acres. Geologic mapping from the State of California indicates that the Project area overlies alluvium, which is the primary water-bearing geologic unit in the subbasin (Gutierrez 2010). This finding was confirmed by geophysical and geotechnical data collected in the Project area (Wilson Geosciences Inc. 2011; TerraPhysics 2010). The alluvium within the subbasin is located within the valley and covers an area of approximately 12,632 acres. The average thickness of the alluvium, as estimated from site-specific geophysical data, is approximately 423 feet (Terraphysics 2010). The remaining 20,314 acres within the subbasin consist of the mountains surrounding the valley (Gutierrez 2010). There is an existing groundwater well at the Rasor Road service station that is located within the bedrock. This well has low yield and is located within volcanic rock formations (Young 2012).

Storage

Subsurface geologic conditions within the subbasin were evaluated using the results of geophysical study performed in the Project area (Terraphysics 2010). The results indicate that the depth to bedrock in the northern portion of the aquifer is approximately 332 feet below ground surface (bgs) ±26 feet and the water table is present within alluvium at approximately 182 feet bgs ±13 feet. In the southern portion of the aquifer, bedrock was estimated to be at least 500 feet bgs and the water table is present within alluvium at approximately 354 feet ±30 feet or deeper. The aquifer is unconfined, as determined from available geotechnical boring and geophysical data (DYA 2010 and Terraphysics 2010).

The storage volume of the subbasin was estimated by multiplying the total volume of the aquifer by the specific yield for the basin. The acreage of the alluvium is 12,632 acres, the average thickness of the saturated alluvium (as estimated from the geophysical sounding results) is approximately 99 feet, and the specific yield of the aquifer is estimated at 0.1 (RMT 2011). The storage of the subbasin is thereby estimated to be approximately 125,000 acre-feet.

Recharge

Many studies have been conducted to determine mountain-front recharge. A 2004 study (Wilson and Guan) included an analysis of quantitative assessments of mountain-front recharge using multiple methods. Recharge rates ranged from 38 percent for highly permeable rock to 0.2 percent for a system where recharge was dominated by streamflow. In systems similar to the project area and consisting of weathered and fractured granitic rock and metamorphic rock, recharge ranged from 7.8 to 8.8 percent. Studies within the Mojave Basin and Death Valley found that 10 percent of runoff becomes recharge (Izbicki 2002 and Hevesi et al. 2003). An estimate of 7.8 percent for mountain-front recharge was used in this analysis and is conservative based on the results of these studies.

Precipitation data for the Project area were obtained from PRISM (PRISM Climate Group 2012) and overlain on the bedrock portions of the subbasin (Figure 4). Only bedrock areas were considered for recharge because valley floor precipitation does not contribute consistently to recharge (Danskin 1998). It is possible that valley recharge in the project area is greater than zero, however no valley recharge was assumed to be conservative. Acreages for each data cell were calculated and the precipitation values were weighted by area to determine a weighted precipitation value for the subbasin. The 20,314-acre mountainous portion of the subbasin receives approximately 4.855 inches (0.405 foot) of rain annually (weighted average), which equates to 8,219 AFY of precipitation.

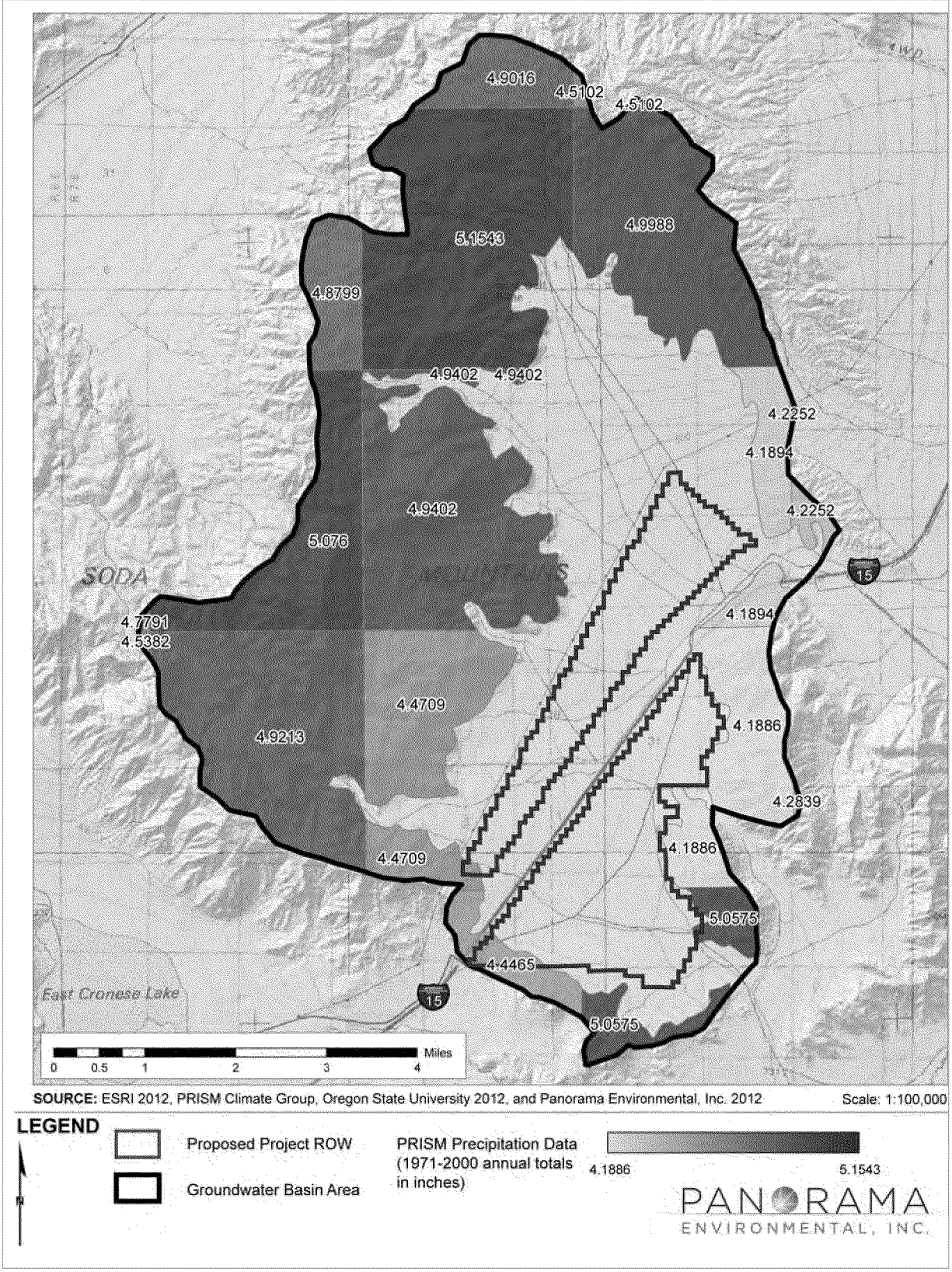
Data analysis for arid basins in the U.S. southwest indicates that approximately 7.8 percent or more of mountain precipitation becomes mountain-front recharge, as stated above. Mountain-front recharge is estimated at 641 AFY using a recharge rate of 7.8 percent.

The Soda Mountains subbasin is geographically and topographically isolated and does not receive much, if any, inflow from adjacent groundwater basins. It is hypothesized that there is interbasin flow throughout the historic Great Basin, though it does not occur uniformly between all basins (Belcher et al. 2009). It is likely that there is some permeability to the Soda Mountains and that the area is part of a regional groundwater flow system. This groundwater input is not included in estimates of groundwater available for use by the project because regional interbasin flow into the basin is likely similar to regional interbasin flow out of the basin.

Safe Yield

Safe yield is defined in San Bernardino County's Desert Groundwater Management Ordinance as "(t)he maximum quantity of water that can be annually withdrawn from a groundwater aquifer (i) without resulting in overdraft (ii) without adversely affecting aquifer health and (iii) without adversely affecting the health of associated lakes, streams, springs and seeps or their biological resources." (Ordinance, Art. 5, § 33.06553.) "Overdraft" is defined in the Ordinance as

Figure 4: Soda Mountain Precipitation



"(t)he condition of a groundwater supply in which the average annual amount of water withdrawn by pumping exceeds the average annual amount of water replenishing the aquifer in any ten year period, considering all sources of recharge and withdrawal." (*Id.*) "Aquifer health" is defined as the "geologic integrity of the affected aquifer, its storage capacity and the quality of water within the aquifer." (*Id.*)

Groundwater inflows to the subbasin through precipitation recharge as described above. Groundwater leaves the subbasin through groundwater flow to Basin No. 6-33 through gaps or lower elevations in the bedrock (Figure 3). The only existing groundwater use in the subbasin is the pumping of a groundwater well installed at the Rasor Road service station (southwest corner of South Array on Figure 1), which is screened in bedrock and is hydrologically separated from the saturated alluvium in the valley (RMT 2011). No wells are known to exist in the interior of the valley. The amount of water = estimated to be used at the Rasor Road service station over the past five years is approximately 10 to 12 gallons per minute (gpm) (16 to 19 AFY) (pers. comm. Terry Young, August 23, 2012). There are no other uses of groundwater within the subbasin and no existing uses within the aquifer.

The safe yield is calculated as follows:

Recharge – Rasor Road Well Extraction = Safe Yield

641 AFY – 19 AFY = 622 AFY

This calculation is conservative because it assumes:

- No recharge from precipitation on the valley floor,
- No input from regional groundwater flow
- 19 AFY is extracted from bedrock and is considered to be isolated from the alluvial aquifer

4.2 GROUNDWATER MANAGEMENT/ADJUDICATION

Basin No. 6-33 has not been adjudicated by the State of California and there is no evidence of current or projected overdraft conditions within the Basin (DWR 1980). . The existing service station well is the only current user of water from the subbasin and the subbasin aquifer is not currently in a state of overdraft, nor is it projected to be. No Urban Water Management Plan or other groundwater management plan has been adopted for Basin No. 6-33 or the subbasin.

San Bernardino County manages water resources within the County under the Desert Groundwater Management Ordinance. Under the Ordinance, "no person, district or other entity . . . shall locate, construct, operate or maintain any new groundwater well within the desert region of San Bernardino County . . . without first filing a written application to do so with the enforcement agency and receiving and retaining a valid permit as provided herein." (Groundwater Management Ord. § 33.06554(a). A groundwater well permit application was filed for the proposed project in September 2012. The groundwater well permit application provides information specified in the Ordinance § 33.06554(b).

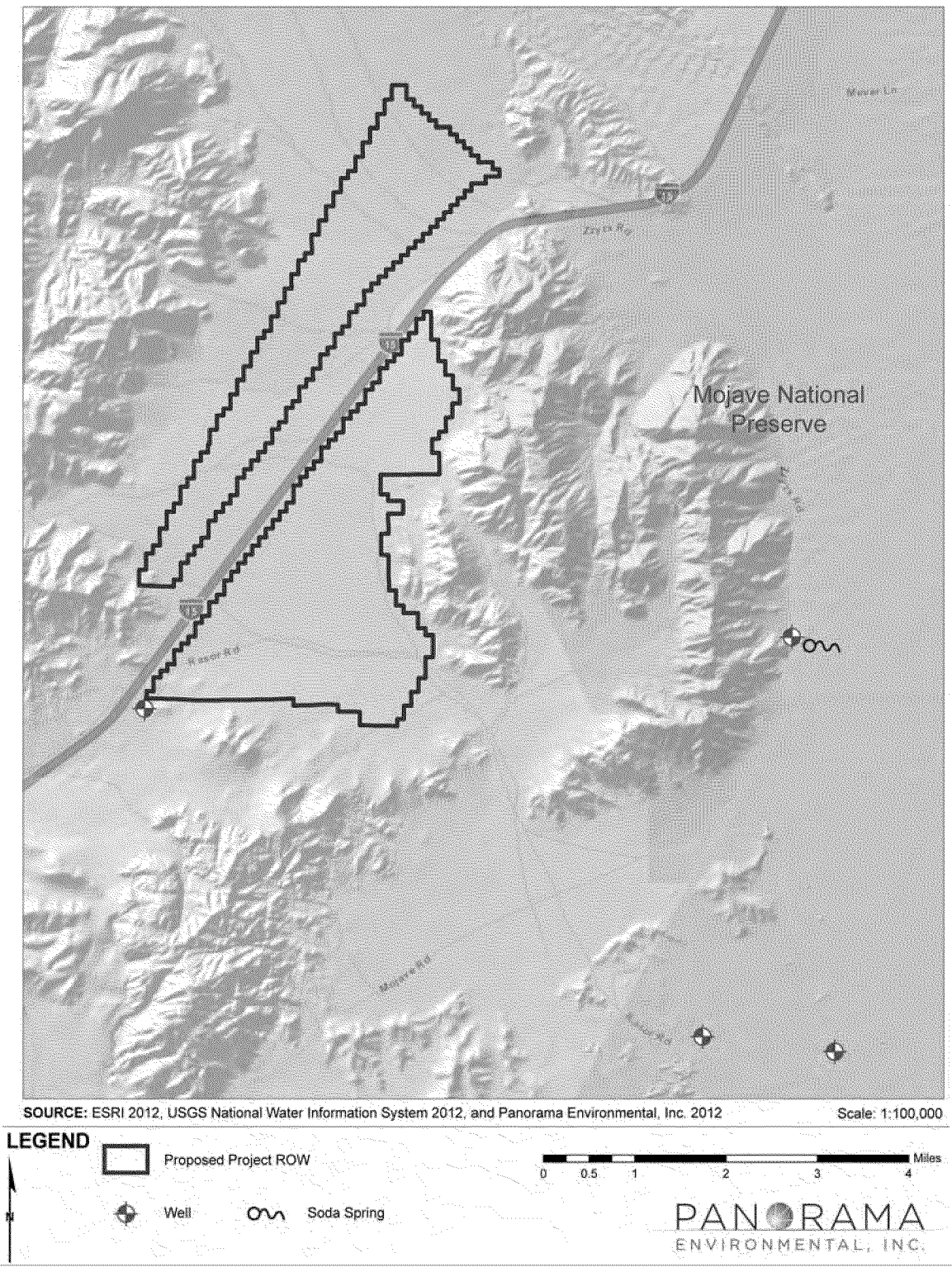
4.3 EXPECTED GROUNDWATER QUALITY

Limited water quality data are available for the Project area due to the absence of wells in the valley. The September 2010 geophysical survey collected subsurface resistivity data that can be used to estimate water quality. Resistivity is the inverse of conductivity. Conductivity is directly correlative to total dissolved solids (TDS) (i.e., higher conductivity is indicative of higher TDS and, conversely, lower resistivity is also indicative of higher TDS). Data from the geophysical investigation indicate that the resistivity of the saturated subsurface differs between the northern and southern portions of the valley, consistent with the interpretation of different groundwater flow directions in the two portions of the valley (RMT 2011), as discussed in the groundwater report. Groundwater at the northern data collection location (i.e., between W-1 and W-2) has very low resistivity (4 ohm-meters), indicating a high conductivity and a high concentration of TDS. Groundwater in the southern portion of the valley (i.e., across I-15 from W-4) has slightly higher resistivity values (15 ohm-meters), indicating relatively high TDS concentrations but lower than at the northern location.

Other groundwater wells in the vicinity of the Project were analyzed to determine measured water quality in the area. Four wells are located within 5 miles of the Project area. These wells are shown on Figure 5.

Water quality at the Rasor Road service station well has TDS concentrations of approximately 3,000 mg/L and requires use of a reverse osmosis system to produce potable water (Young 2012). The Desert Studies Center is located along Zzyzx Road on the east side of the Soda Mountains, on the west margin of Soda Dry Lake and southeast of the Project ROW. A well located at the Center was sampled in May 2000. The Center is located on the other side of the Soda Mountains from the Project ROW, outside of the subbasin. TDS in the well is 1,890 mg/L. Water quality data from the well are not likely representative of water quality at the Project well locations due to the separation of the Desert Studies Center from the Project area by mountains. Several wells are present in the region surrounding the Project ROW although none are located within the subbasin.

Figure 5: Groundwater Wells



5 PROJECT DEMAND ANALYSIS

5.1 EXISTING USES

The well at the Rasor Road service station is located in the Soda Mountain subbasin. This well is located in bedrock and is not in the alluvial aquifer. No wells are known to exist that are screened in the alluvial aquifer. The amount of water that is estimated to be used at the Rasor Road service station is approximately 16 to 19 AFY. There are no other uses of groundwater within the subbasin and no existing uses within the aquifer.

5.2 PLANNED FUTURE USES

There are no planned future uses of groundwater within the subbasin. Groundwater withdrawal at the Rasor Road service station would be expected to remain constant due to the limited well productivity. The solar panels of the Project would cover about 21% of the alluvium within the valley.

2,691 acres of panels ÷ 12,632 acres of alluvium = 21% of alluvial area

5.3 PROPOSED USE

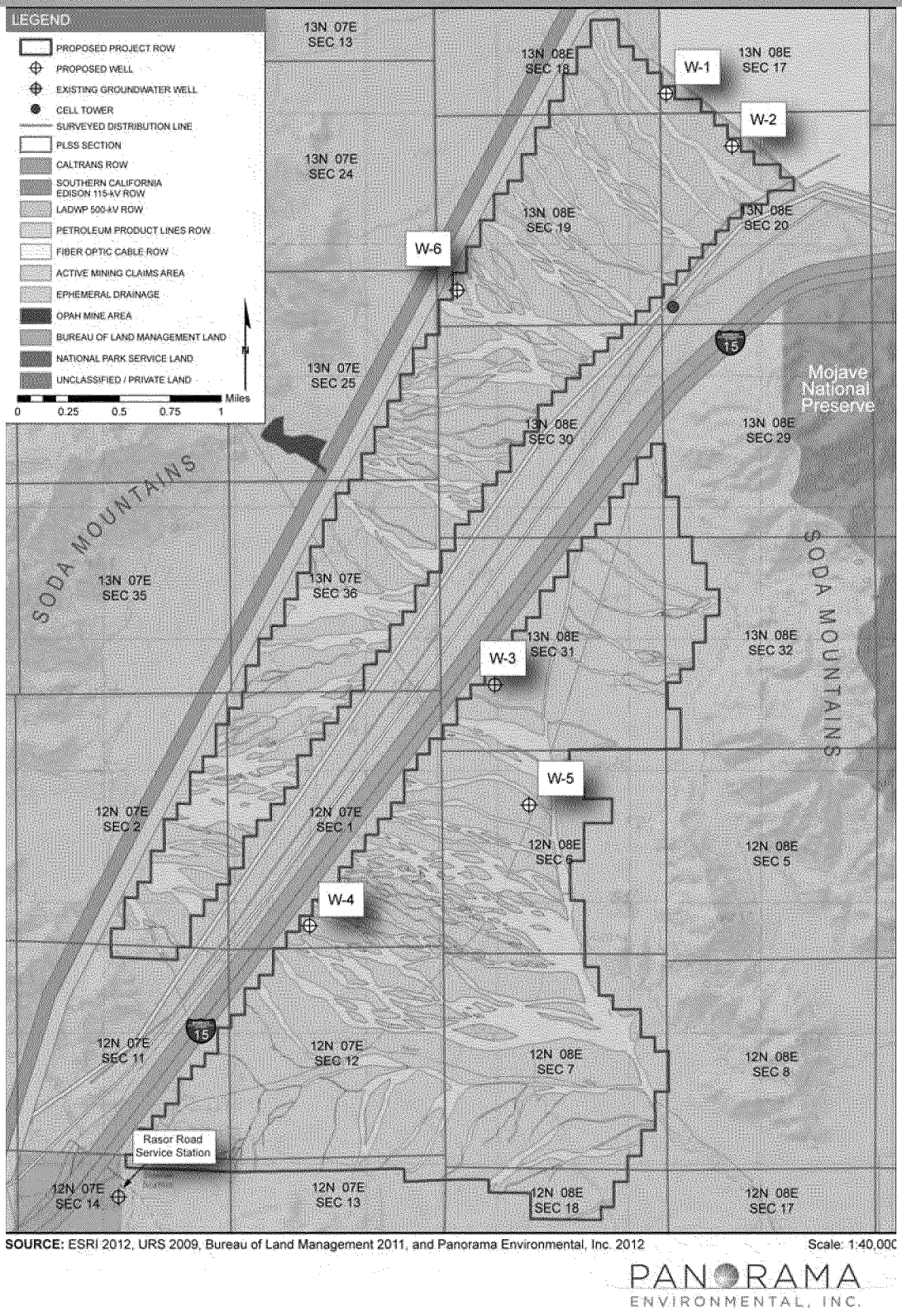
5.3.1 Location

It is anticipated that two to four wells will be constructed to provide the water supply for the proposed Project. Multiple wells will be required for the Project to provide spatial coverage over the 4,500-acre ROW on both sides of I-15 and also to provide redundancy when a Project well is out of service for scheduled or unscheduled maintenance. Six possible well locations have been identified to provide siting flexibility (Figure 6).

5.3.2 Quantity

During Project construction, extracted groundwater will be used primarily for dust control and soil compaction. Additional water will be extracted and stored for fire suppression. The quantity of water to be used is estimated to be approximately 192AFY, equivalent to a volume of 200,000 gpd when pumped 24 hours/day, 6 days/week. Pumping rates may periodically peak at 300,000 gpd but the amount of water pumped annually would equate to an average of 192AFY. Water will be applied directly to the ground surface by either a water truck or workers using hoses. Water used for dust control may be mixed with a dust suppressant prior to application (the dust suppressant would be determined by construction contractor). Dust control and soil compaction will be necessary throughout the entire 3-year construction period.

Figure 6: Potential Well Locations



SOURCE: ESRI 2012, URS 2009, Bureau of Land Management 2011, and Panorama Environmental, Inc. 2012 Scale: 1:40,000

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During Project operation, extracted groundwater will be used primarily for PV panel washing. Other water needs during Project operation will include fire suppression and, possibly, potable water supply for the operations and maintenance building. Approximately 7 AFY would be extracted from the site water supply wells during the operational phase. Approximately 5.4 AFY would be used for panel washing and 1.5 AFY would be used for potable water uses at the operations and maintenance buildings. Water will be applied directly to the panels through use of a panel cleaning system. Details of the cleaning system will be determined later in the Project development process. Panel cleaning will be necessary throughout the lifespan of the Project but will only occur once or twice each year during an estimated 21-day period. The total annual water demand for the Project is summarized in Table 2.

Table 2: Project Water Demand

Activity	Annual Water Demand (AFY)	Period of Performance	Total (AF)
Construction	192	3 Years	576
Operation	7	30 Years	210
Total Water Demand Over Life of Project			**786**

6 GROUNDWATER SUPPLY AVAILABILITY

This section assesses Project and non-Project water needs over a 20-year future projection to determine whether there are sufficient supplies to serve the Project over the next 20 years. The assessment considers average-year ("normal" year), single-dry year, and multiple-dry year (drought) conditions. A multiple-dry year scenario is assumed to be 3 years long for the purpose of this analysis.

Project water demand for a projected 20-year period is summarized in Table 3. Project water demand would be greatest during the 3-year construction period. Total Project water use would be approximately 695 acre-feet for the 20-year period following the initiation of construction.

The subbasin is estimated to receive approximately 8,219 acre-feet of precipitation under normal-year conditions. The amount of mountain-front recharge within the subbasin is approximately 641 AFY, which is the precipitation recharge value used to represent normal-year conditions. Normal year conditions were estimated using PRISM (2012).

The precipitation monitoring station closest to the Project area is in Baker (#040436), about 6 miles to the northeast. Baker rainfall data for the years 1971 through 2012 were analyzed to determine single-dry year, and multiple-dry year precipitation based on measured (i.e., not modeled) data in the Project vicinity (Western Regional Climate Center [WRCC] 2012). Average annual precipitation in Baker between 1971 and 2012 is 4.009 inches. Precipitation in Baker is estimated to be approximately 0.846 inch less than that in the Soda Mountains subbasin (PRISM

Table 3: 20-year Project Water Use Projections (acre-feet)

Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Water Use	192	192	192	7	7	7	7	7	7	7
5-year Average	--	--	--	--	118	--	--	--	--	7
Total	**192**	**384**	**576**	**583**	**590**	**597**	**604**	**611**	**618**	**625**
Year	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Water Use	7	7	7	7	7	7	7	7	7	7
5-year Average	--	--	--	--	7	--	--	--	--	7
Total	**632**	**639**	**646**	**653**	**660**	**667**	**674**	**681**	**688**	**695**

2012). Baker is located 6 miles from the Project in an area with lower elevation than the Project site (elevations in Baker range from about 950 to 1,000 feet and in the project area the range is 1,250 to 1,550 feet). The difference in the estimated average rainfall between Baker and the Project site is attributed to the difference in elevation and topography between the two areas. The western Soda Mountains reach 3,600 feet.

6.1 SINGLE DRY-YEAR

A probability-based estimate is used to determine water availability during a single dry-year. Single dry-year rainfall is estimated as a year with a 10 percent probability of occurrence (DWR 2003). The predicted rainfall for a single dry-year is 1.726 inches or 43 percent of normal-year rainfall in Baker. Within the Soda Mountains subbasin, 43 percent of the normal-year rainfall of 4.855 inches is 2.088 inches. A single dry-year would not affect the safe yield of the basin. The aquifer would be expected to rebound following a single dry-year, when rainfall increases.

6.2 MULTIPLE DRY-YEAR

Multiple dry-years are estimated using historical precipitation analysis. Rainfall is estimated for the driest three-year period on record (DWR 2003). The 2005 to 2008 water years are the driest three-year period on record. Between 2005 and 2008 precipitation at the Baker monitoring station was measured as follows:

- Year 1: 1.34 inches (2005-2006 water year)
- Year 2: 3.83 inches (2006-2007 water year)
- Year 3: 1.83 inches (2007-2008 water year)

The Year 2 rainfall is less than 0.2 inch lower than the normal-year value; however, it occurs within the lowest 3-year period of precipitation during the recorded history. The Year 1, Year 2, and Year 3 precipitation values represent 33 percent, 96 percent, and 46 percent of average annual rainfall, respectively. Within the Soda Mountains subbasin this equates to precipitation values of 1.602 inches, 4.661 inches, and 2.233 inches, respectively.

6.3 DRY YEAR SUPPLY

Precipitation recharge in the subbasin during normal-, single dry-, and multiple dry-years is summarized in Table 4.

Under a single-dry year scenario the subbasin would be expected to have approximately 57 percent less recharge than during a normal water year. Under multiple-dry year conditions, the SM subbasin would have an average of 41 percent less recharge (over the 3 year period) than during normal water years.

Table 4: Precipitation Recharge to Soda Mountains Subbasin		
Climate Scenario	**Precipitation Recharge (AFY)**	**Percent of Normal Year**
Normal Water Year[1]	641	100%
Single Dry-water Year[2]	276	43%
Multiple Dry-water Years[3]		
Year 1	212	33%
Year 2	615	96%
Year 3	295	46%

[1] Normal water year precipitation recharge is based on the 40-year average rainfall between 1971 and 2000 for the mountainous areas of the subbasin (PRISM Climate Group 2012).

[2] Single dry-year precipitation recharge is scaled from the 2001-2002 water year for the Baker gauging station (WRCC 2012).

[3] Multiple-dry water year precipitation recharge is scaled from the 3-year period between 2005 and 2008 for the Baker gauging station (WRCC 2012). Although Year 2 precipitation is only slightly less than that for the normal water year, the 3-year period had the lowest precipitation overall on record for the data collection period.

6.4 DRY YEAR DEMAND

Water supply availability projections for a 20-year period are presented in Tables 5 and 6. Table 5 presents projections for the 3-year construction period with the highest Project related water use (192 AFY). Table 6 presents projections for the subsequent 17-year operational period. The existing pumping data refers to the estimated pumping rate for the Rasor Road service station well. It was assumed for the purpose of the analysis that the pumping rate at this well would remain constant because it is a low-producing well and the maximum pumping rate could not increase.

Table 5: Groundwater Availability Projections for Years 1 through 3 (Construction)					
Climate Scenario	**Precipitation Recharge (AFY)**	**Existing Pumping (AFY)[1]**	**Project Pumping (AFY)**	**Total Demand (AFY)**	**Balance (AFY)**
Normal Year	641	19	192	211	430
Single-dry Year	276	19	192	211	65
Multiple-dry Years					
Year 1	212	19	192	211	1
Year 2	615	19	192	211	404
Year 3	295	19	192	211	84
Multiple Dry-Year Balance					**489**

[1] Existing pumping is from the Rasor Road service station well, the only well known to exist in the subbasin.

Table 6: Groundwater Availability Projections for Years 4 through 20 (Operation)					
Climate Scenario	**Precipitation Recharge (AFY)**	**Existing Pumping (AFY)[1]**	**Project Pumping (AFY)**	**Total Demand (AFY)**	**Balance (AFY)**
Normal Year	641	19	7	26	615
Single-dry Year	276	19	7	26	250
Multiple-dry Years					
Year 1	212	19	7	26	186
Year 2	615	19	7	26	589
Year 3	295	19	7	26	269

[1] Existing pumping is from the Rasor Road service station well, the only well known to exist in the subbasin.

The groundwater balance for construction and operation is positive under all water year conditions.

7 COMPARISON OF PROJECTED WATER SUPPLY AND DEMAND

The Project would use approximately 786 acre feet of water during construction and the estimated life of the project (33-year period). This volume of water is less than 1 percent of the estimated storage (125,000 AF) of the Soda Mountain subbasin.

The Soda Mountains subbasin is not currently in overdraft. Project construction needs (192 AFY) represent 30 percent of the estimated amount of subbasin recharge during a normal water year (641 AFY) and will be short-term (approximately 3 years) in duration. The subbasin would not result in overdraft during either a single dry-year or multiple dry-year scenario. Water use would significantly decrease during Project operation. Project operation needs of 7 AFY represent about 1 percent of the normal-year subbasin recharge and will be long-term in duration (up to 30 years or more). Overdraft conditions, if they were to occur, would be temporary, and the aquifer would recover from the potential negative water balance year(s) after construction is completed.

Water supply needs for both construction and operation can be met with the groundwater resources of the Soda Mountains subbasin. There is sufficient water available for the proposed Project under normal-year, single dry-year, and multiple dry-year conditions. The Project would not result in adverse impacts associated with groundwater supply or water supply reliability. Any potential negative water balance would be limited to extreme drought conditions with less than 10 percent chance of occurrence. The aquifer would subsequently rebound during normal water years and throughout operation of the project.

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APPENDIX H-3
Hydrogeologic Conditions and Groundwater Modeling Report Addendum

SMSP01307

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Hydrogeological Conditions and Groundwater Modeling Report Addendum

Soda Mountain Solar Project

BLM Case No. CACA 49584

May 2013

Hydrogeological Conditions and Groundwater Modeling Report Addendum

Soda Mountain Solar Project

BLM Case No. CACA 49584

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TABLE OF CONTENTS

1 Background 1

2 Hydrogeologic Cross Sections 3

2.1 Cross Section A–A′ 3

2.2 Cross section B–B′ 3

2.3 Cross Section C–C′ 6

3 Model Revisions 7

4 Model Results 8

4.1 Calibration 8

4.2 Effects of Proposed Groundwater Extraction - Predictive Simulations 12

5 Discussion 21

5.1 Recharge 21

5.2 Model Boundaries Consider Outflow to East 22

5.3 Potential for Impacts to Soda Springs at Zzyzx and Mohave Tui Chub 22

6 Conclusions 28

6.1 Water Availability and number of wells 28

6.2 Effects of Groundwater Pumping 28

6.3 Effects to Soda Springs at Zzyzx 29

7 Recommendations 30

8 References 32

Figures

Figure 1: Project Location 2

Figure 2: Locations of Geologic Cross Sections 4

Figure 3: Geologic Cross Sections 5

Figure 4: Model Grid and Model Domain[1] 9

Figure 5: Steady State Calibration, High-End Parameters 10

Figure 6: Steady State Calibration, Low-End Parameters 11

Figure 7: Three Wells, 3 Years, High-end Parameters 13

Figure 8: Three Wells, 30 Years, High-End Parameters 14

Figure 9: Three Wells, 3 Years, Low-End Parameters 16

Figure 10: Three Wells, 30 Years, Low-End Parameters 17

Figure 11: One Well, 3 Years, High-End Parameters 19

Figure 12: One Well, 30 Years, High-End Parameters 20

Tables

Table 1: Revised Model Parameters 7

Table 2: Predicted Hydraulic Heads Versus "Measured" Heads from TEM Results 8

Table 3: Summary of Results at Each Well Point 15

Table 4: Groundwater Discharge at Northeast Outlet of Soda Mountain Valley 15

Table 5: Groundwater Use at Zzyzx 24

Table 6: Groundwater Budget 26

Appendix A NPS Comments

1 BACKGROUND

The Soda Mountain Solar Project (project) will include the installation, operation, and maintenance of a 350-megawatt electric generating facility (Caithness 2011). The project area is located in a small valley on federal lands managed by the U.S. Department of the Interior, Bureau of Land Management (BLM), approximately 6 miles southwest of the town of Baker in San Bernardino County, California (Figure 1). Groundwater modeling was used to help evaluate whether the hydrogeologic conditions at the Project site could sustain the withdrawal of water needed during construction, operation, and maintenance of the proposed solar facility, without causing impacts to nearby water users or environmental resources located within the Mojave National Preserve. The initial groundwater modeling results were presented in *Hydrogeologic Conditions and Groundwater Modeling Report* (RMT 2011) ("Model Report").

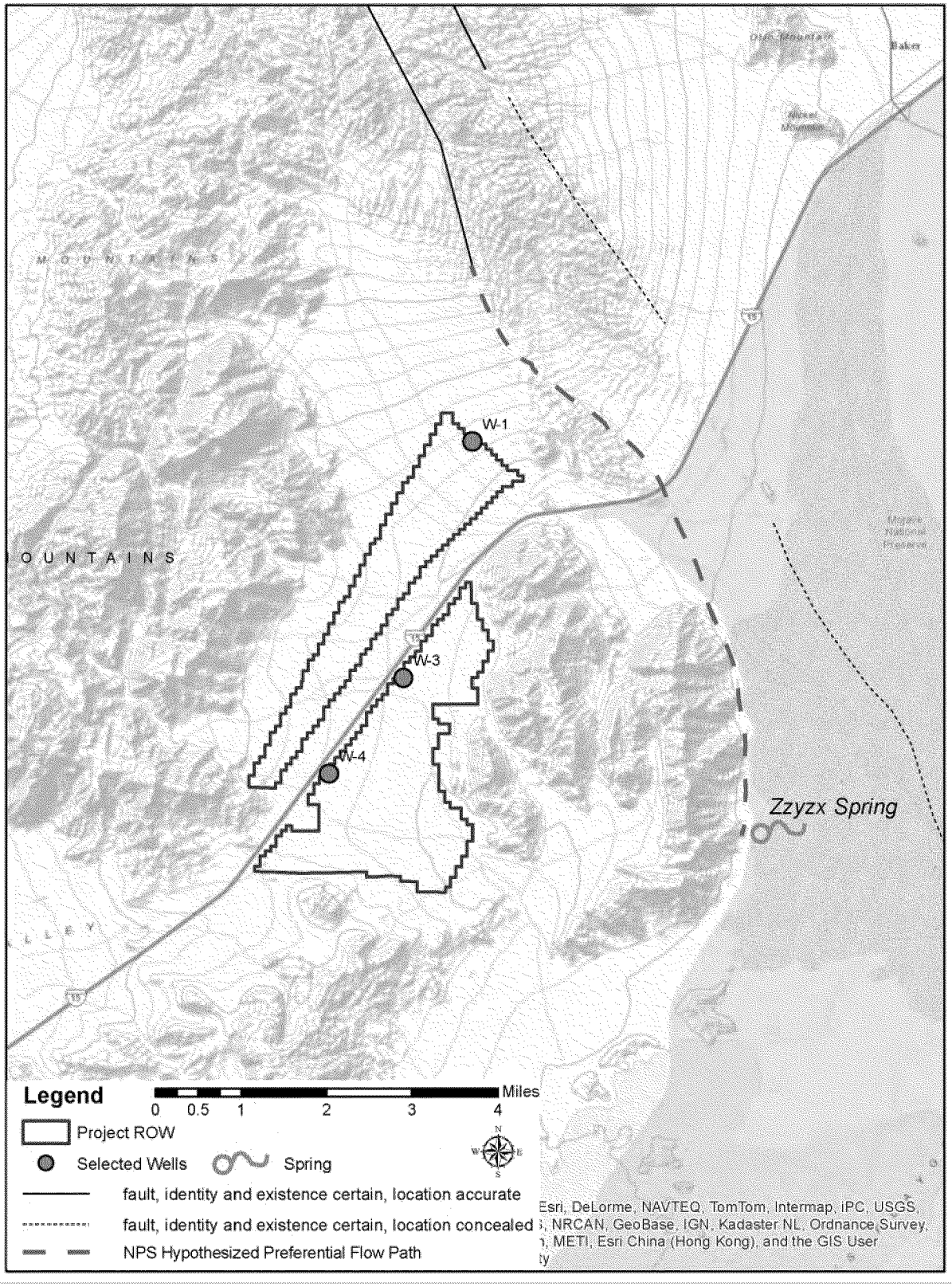
This addendum to the Model Report has been prepared to address:

1. Revised water use estimate for construction from 61 acre feet per year (AFY) to 192 AFY
2. Modeling of water use for project operation
3. Possible use of up to three groundwater wells
4. National Park Service (NPS) comments on the Model Report

NPS, Mojave National Preserve, presented scoping comments on the project in a letter dated November 21, 2012 (NPS 2012) addressed to San Bernardino County Land Services Department, Planning Division, and to the BLM, California Desert District Office, Moreno Valley (Appendix A). NPS comments on the Model Report, included:

- The modeling assumed an overly high recharge rate.
- The model did not account for the possibility of permeable bedrock to the east of the project area. NPS suggested one potential source from which Soda Springs at Zzyzx might derive significant flow is a potential preferential groundwater flow path extending from known fracture traces north and south of the Soda Springs at Zzyzx. The NPS's hypothesized preferential flow path is illustrated in Figure 1.
- The analysis did not adequately addresses potential impacts to the springs at Zzyzx.

Figure 1: Project Location



2 HYDROGEOLOGIC CROSS SECTIONS

A cross section location map is presented in Figure 2. Revised cross sections A–A', B–B', and C–C' are presented in Figure 3. These cross sections were previously presented in RMT's 2011 Model Report. The revised cross sections do not display the vertical exaggeration used in the Model Report (which caused potential confusion over the distance between the springs at Zzyzx and the proposed groundwater wells). The revised cross sections also include the type and extent of bedrock units. The following discussion is derived largely from the Model Report, with additional discussion of the bedrock geology.

2.1 CROSS SECTION A–A'

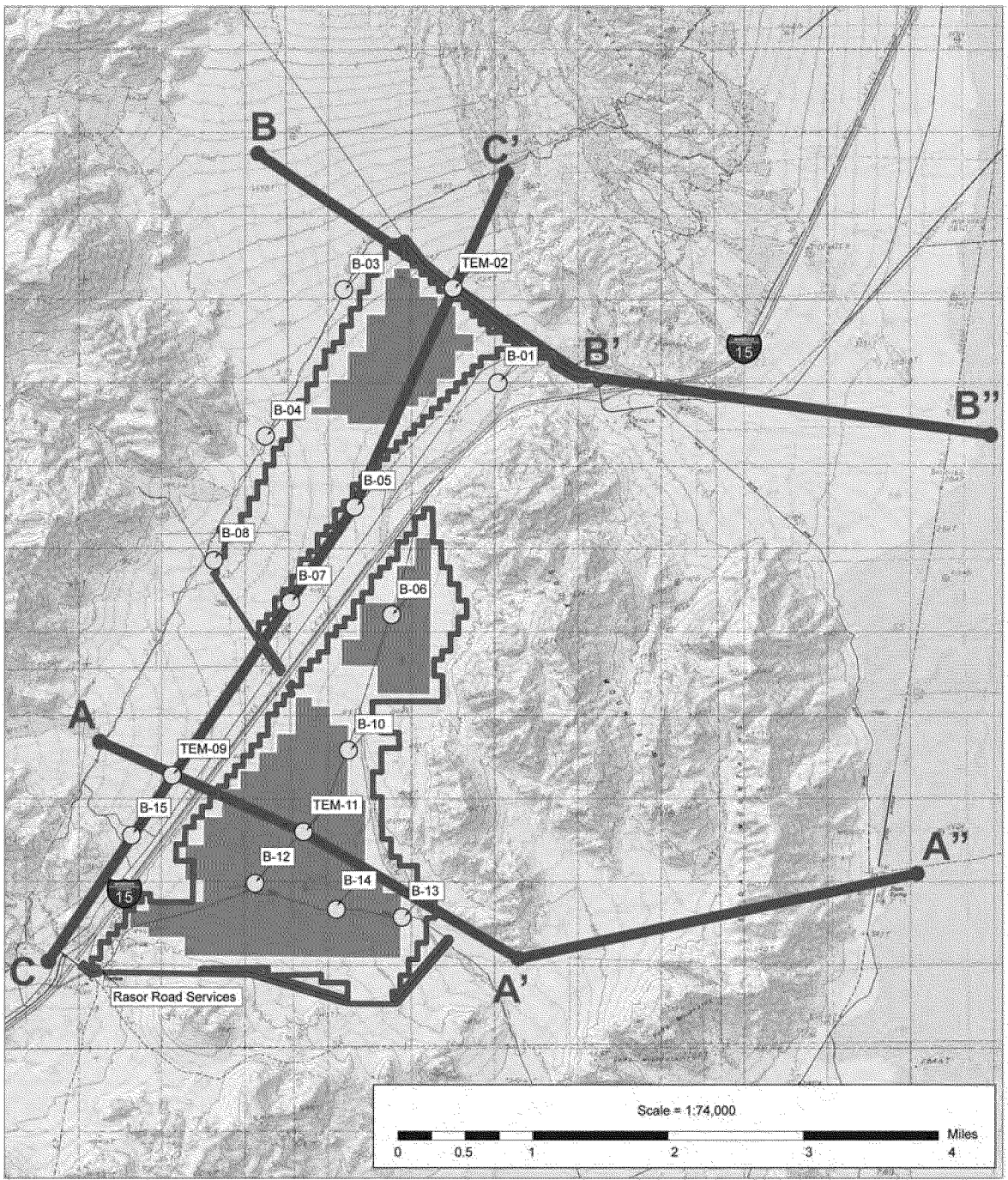
Cross section A–A' extends west to east and incorporates geophysical data from TEM-09 and TEM-11, which are located near the southern end of the valley (Figure 3). The cross section extends eastward across the mountain range to Soda Springs at Zzyzx, located on the eastern slope of the eastern Soda Mountains, above Soda Lake. Bedrock occurs at depths of 500 feet or more below ground surface (bgs) at TEM-09 and 436 feet bgs at TEM-11. The bedrock outcrops on the slopes of the Soda Mountains. Geologic mapping from Jenkins (1962) and Wilson (2011) indicates that Mesozoic granitic rocks make up much of the subsurface bedrock, with Jurassic-Triassic metavolcanic rocks forming significant portions and higher reaches of the Soda Mountains. A localized outcrop of carbonate rock is present in the vicinity of Soda Springs at Zzyzx, but its mapped extent appears to be limited to the vicinity of the spring (Jenkins 1962).

The water table occurs at an elevation of approximately 1,170 feet amsl at TEM-09, and appears to be below an elevation of approximately 922 feet amsl at TEM-11. The apparently much lower water table at TEM-11 suggests that there is an outlet for groundwater southeast of TEM-11 that allows the water table to drain to this lower elevation. A surface-water outlet is present in the southeast portion of the valley (Figure 2), and it is reasonable to assume an alluvium valley fill bedrock cut exists at this location. This conceptual model satisfies the need for a groundwater outlet to occur in the southeast portion of the valley, where the water table is apparently much lower than elsewhere, as seen at TEM-11.

2.2 CROSS SECTION B–B'

Cross section B–B' extends west to east along the northern boundary of the project area, and shows a similar topographic slope to the east as was shown on cross section A–A', paralleling the surface water outlet to the east (Figure 3). Drainages from large alluvial fans converge into the surface water outlet that flows through a relatively narrow valley between low mountains to the north and south (Figure 2). The funneling of the surface water outflow suggests that, as for

Figure 2: Locations of Geologic Cross Sections



SOURCE: Wilson Geosciences 2010, ESRI 2011, RMT Inc. 2011, and Panorama Environmental, Inc. 2013

LEGEND

A A' Cross Section Line

Project Boundary

Array Areas

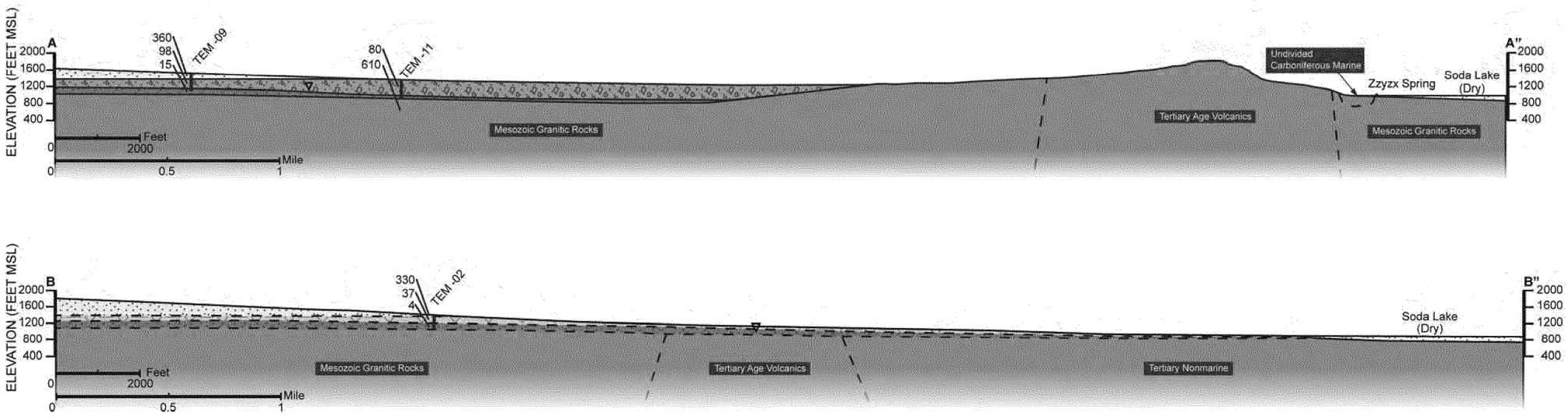
Borehole

N W E S

USGS Quads: West of Soda Lake, Soda Lake North, Soda Lake South, and Crucero Hill

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Figure 3: Geologic Cross Sections



SOURCE: TRC 2013

LEGEND

- Stratigraphic Boundary (Dashed Where Inferred)
- 80 — Resistivity (ohm-meters), TEM Survey
- Dry, C. GR. Alluvium
- Dry, C. GR. & F. GR. Alluvium
- Dry to Very Moist F. GR. Alluvium
- Dry, F.-C. GR. Alluvium
- Saturated Alluvium
- Bedrock

NOTE: Bedrock geology based on Bedrossian (2012) and Jenkins (1962).

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cross section A–A', there may be a buried bedrock valley at this location. The funneling of surface water through this narrow gap suggests that there may be coarser sediments in the valley fill at this location. A small outcrop of limestone present near Zzyzx east of Soda Mountain on cross section point A is labeled as Undivided Carboniferous Marine. Extrapolation of mapped bedrock units into the subsurface indicates that Mesozoic granitic rocks predominate in the western portion of cross section point B, and Tertiary volcanic rocks form the central portion of the cross section. Tertiary nonmarine rocks are mapped in the eastern portion of the cross section, extending to the areas beneath Soda Lake.

The water table is interpreted to be at a depth of approximately 182 feet bgs at TEM-02 (elevation of 1,232 feet amsl), the shallowest groundwater occurrence of any of the three TEM locations. The groundwater elevation at TEM-02 is approximately 300 feet higher than the water table in the Soda Lake Valley located east of the project area (Figure 2). Groundwater elevations in the Soda Lake Valley range from 945 feet amsl to 958 feet amsl based on available U.S. Geological Survey (USGS) data (USGS 2013). Soda Springs at Zzyzx is located at an elevation of 948 feet approximately 200 to 300 feet below the groundwater elevation in the Soda Mountain Valley. The conceptual model illustrated on cross section B–B' is that the water table slopes steadily eastward from the upper reaches of the alluvial fans to the base of the valley. Groundwater is channeled through the relatively narrow buried valley outlet located near the northeast corner of the project area, flowing eastward toward the Soda Lake lowlands.

2.3 CROSS SECTION C–C'

Cross section C–C' extends northeast to southwest down the longitudinal axis of the valley (Figure 3). From south to north, bedrock units represented in the valley include Tertiary volcanic rocks (rhyolite, andesite), Mesozoic granitic rocks, and Jurassic-Triassic metavolcanic rocks.

A surface water divide located approximately 1.5 miles north of TEM-11 separates water flowing to the northeast outlet from water flowing to the southeast outlet (Figure 2). It is likely that groundwater flow approximately mimics the surface water flow, flowing northward in the northern half of the valley, and southward in the southern half.

TEM data indicate that the saturated subsurface resistivity differs between the northern and southern portions of the valley, consistent with the interpretation of different groundwater flow directions in the two portions of the valley. Groundwater at TEM-02 has very low resistivity (i.e., 4 ohm-meters), indicating a high concentration of total dissolved solids (TDS). Groundwater in the southern portion of the valley exhibits higher resistivity values at TEM-09 (i.e., 15 ohm-meters), indicating high TDS concentrations but lower concentrations than at TEM-02.

3 MODEL REVISIONS

The existing three-dimensional MODFLOW (MacDonald and Harbaugh 1988) groundwater flow model (RMT 2011) was revised through consideration of comments by staff at NPS and BLM as well as updated water use estimates. Model revisions included the following:

- Reduction of recharge values for the high-end parameter set from 0.5 inches per year to 0.4 inches per year (10 percent of rainfall, which averages 4 inches per year), and accompanying reduction of hydraulic conductivity (K) from 4.0 to 3.2 feet/day (ft/d) for the majority of the site (see Table 1). Equivalent reductions were made in the focused recharge at the boundary nodes, simulating mountain front runoff. The rationale for the selected recharge values is presented in Section 5.1.
- Revision of recharge value for the low-end parameter set from 0.125 inches per year to 0.12 inches per year (3 percent of rainfall), and accompanying reduction of K from 1.0 ft/d to 0.86 ft/d for majority of site (Table 1). Equivalent reductions were made in the focused recharge at the boundary nodes, simulating mountain front runoff.
- Increase in estimated groundwater extraction rates during a 3-year period of construction from 61 to 192 AFY.
- Increase in estimated groundwater extraction rates during operation from 7 to 33 AFY to allow for water use in dust control mitigation during operation of the project.
- Extraction from a single well in the southern portion of the site.
- Extraction from three wells located at select locations across the site.
- Refinement of grid spacing in the vicinity of well locations for greater accuracy.

Table 1: Revised Model Parameters

Aquifer Parameters

Parameter Set Name	*Hydraulic Conductivity (K) (ft/d)*	*Groundwater Recharge (R) (inches/year) [AFY]*	*Storage Coefficient (unitless)*
High End	3.2	0.4 in/yr [1,330 AFY]	0.1
Low End	0.86	0.12 in/yr [376 AFY]	0.1

Note: Values given are for main body of model domain. Nodes at the model boundaries have higher R values. Nodes near the northeast and southeast outlets have higher K values.

4 MODEL RESULTS

4.1 CALIBRATION

The revised model grid and model domain are shown in Figure 4. Figure 5 presents the steady-state hydraulic head distribution for the calibrated model for the revised high-end set of hydraulic conductivity (K) and recharge (R), with values of 0.4 inches per year (total of 1,330 AFY) for recharge. Figure 6 portrays the head distribution for the low-end set of K and R, with values of 0.12 inches recharge per year (total of 376 AFY). The steady-state head distributions are virtually identical for the high-end and low-end model runs. Table 2 shows the results of the calibration, comparing model results to heads estimated from TEM results.

For the high-end parameter set (10 percent recharge), predicted head values at TEM-02 were 1,233 feet amsl, nearly matching the 1,232 value estimated based on TEM results. The predicted head value for TEM-09 in the model (1,157 feet amsl) was well within the range of uncertainty for the estimated value based on TEM results (1,170 ± 30 feet amsl).

For the low-end parameter set (3 percent recharge), predicted head values at TEM-02 were 1,235 feet amsl, nearly matching the 1,232 value estimated based on TEM results. The predicted head value for TEM-09 in the model (1,157 feet amsl) was well within the range of uncertainty for the estimated value based on TEM results (1,170 ± 30 feet amsl).

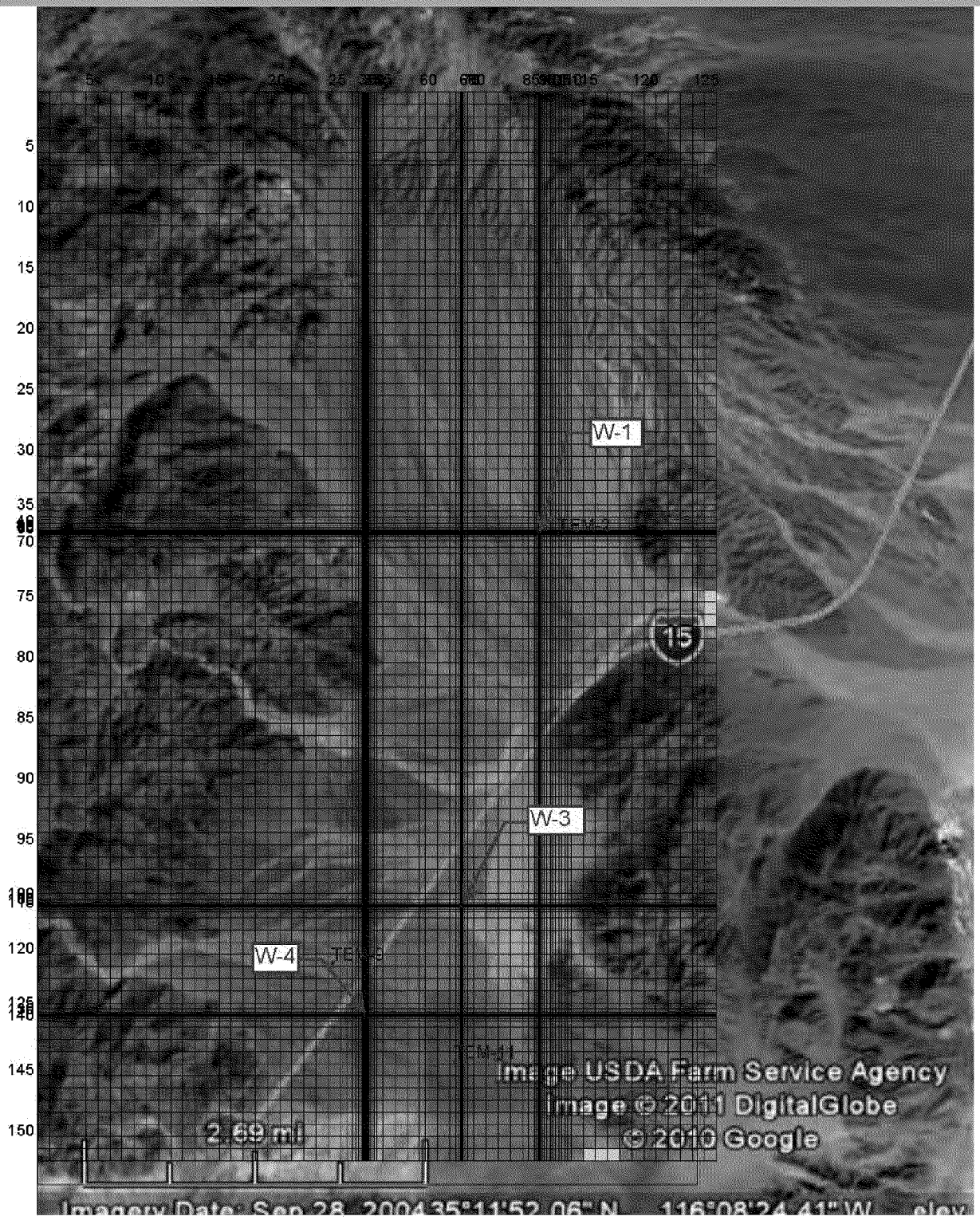
Mass balance errors were low for the calibrated model, at 0.02 percent and 0.03 percent respectively for the high-end and low-end parameter sets. All water entering the model is derived from areal recharge. Outflow is through the northeast and southeast outlets, through general head boundary (GHB) nodes assigned to those locations. In general, the match of the model values to the two values interpreted from geophysical data is considered adequate for an area with such sparse hydrogeologic data.

Table 2: Predicted Hydraulic Heads Versus "Measured" Heads from TEM Results

	High-End Parameter Set		Low-End Parameter Set	
Measurement Location	***Predicted Head (feet amsl)***	***Measured Head (feet amsl)***	***Predicted Head (feet amsl)***	***Measured Head (feet amsl)***
TEM-02	1,233	1,232±13	1,235	1,232±13
TEM-09	1,157	1,170±30	1,164	1,170±30

Note: Measured head values were estimated based on TEM survey results from Terra Physics (2010).

Figure 4: Model Grid and Model Domain[1]



[1] Blue nodes represent general-head boundary conditions where groundwater is allowed to flow out of the model domain.

SMSP01321

Figure 5: Steady State Calibration, High-End Parameters

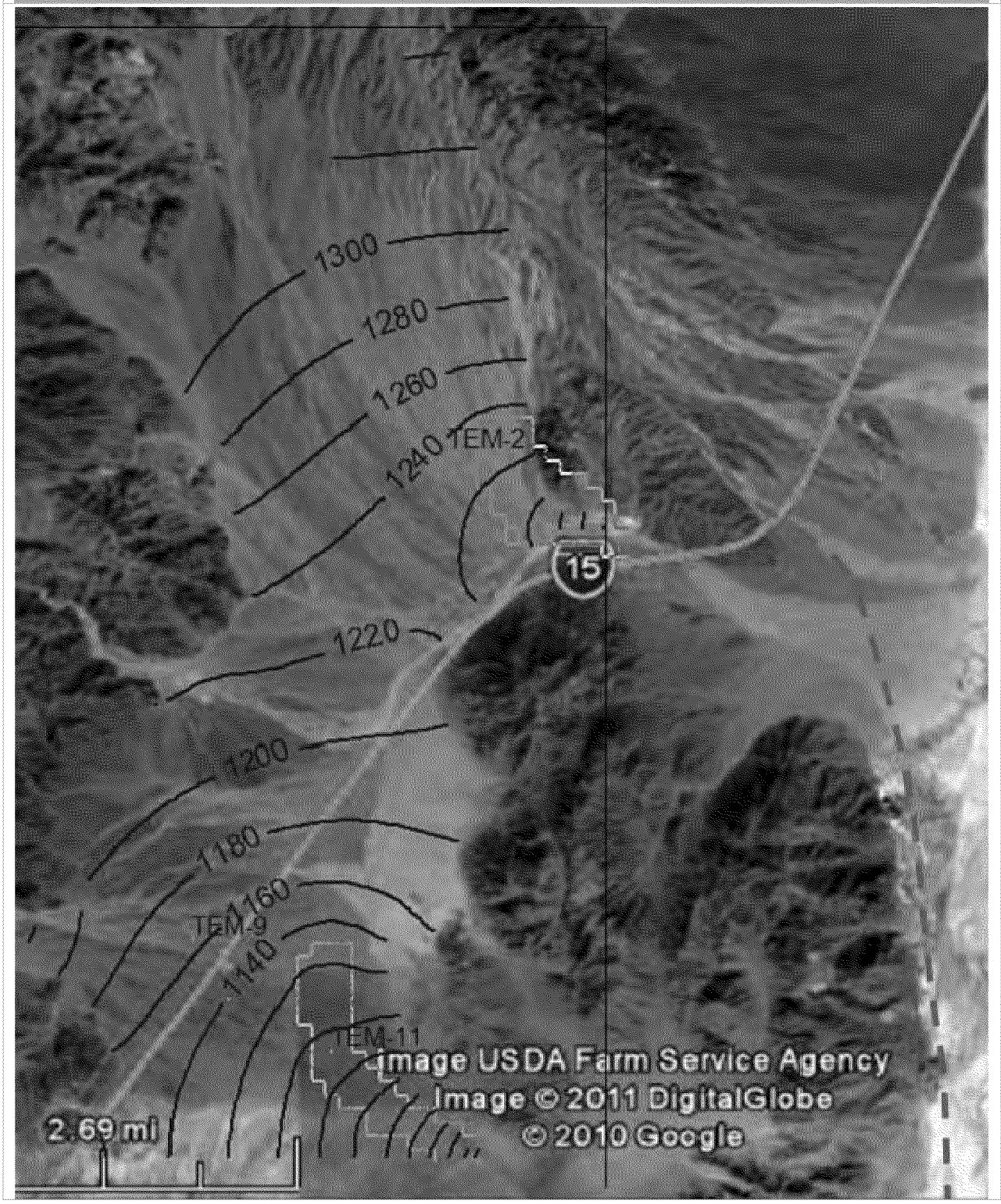


Figure 6: Steady State Calibration, Low-End Parameters



4.2 EFFECTS OF PROPOSED GROUNDWATER EXTRACTION - PREDICTIVE SIMULATIONS

4.2.1 Pumping Rates Needed for Construction and Operation

Water needs for construction were revised from earlier estimates and are now estimated to be approximately 192 AFY for two to three years (Soda Mountain Solar 2013). Water needs for operation and maintenance (i.e., for PV panel cleaning, potable water use, and dust control during operation) are estimated to be approximately 33 AFY (Soda Mountain Solar 2013).

Water supply wells were simulated as operating under the conditions expected during construction and operation. Specifically, one and three wells were simulated to be pumping continuously at a combined rate of 192 AFY to accommodate the proposed water use of 200,000 gallons per day, 6 days per week (average continuous withdrawal of 171,000 gallons/day, or 22,913 ft^3/day) for a period of three years, the upper estimate of construction duration. Subsequently, one and three wells were simulated with combined extraction of 33 AFY for an additional 27 years (total simulation time of 30 years, the anticipated life of the project).

4.2.2 Selected Location of Water Supply Wells

Three potential locations for groundwater extraction wells have been selected, based on existing hydrogeologic data from TEM locations and borings and based on proximity to project operational facilities. The three locations are shown on Figure 1 and are named W-1, W-3, and W-4. W-4 was selected as the optimal location for simulation of a single water supply well; however, it is likely that two to three wells will be constructed to provide backup water supply and allow for well maintenance. Simulations were conducted for single well and three-well scenarios to evaluate the feasibility of obtaining sufficient water with acceptable drawdown under these scenarios.

4.2.3 Results of Simulated Groundwater Withdrawals

Three Wells, High-End Parameter Set (10 Percent Recharge)

Figure 7 shows the resulting drawdown and radius of influence predicted around a water supply well after three years of pumping at three wells, with a combined total of 171,000 gallons per day, or 192 AFY (representing the construction phase), for the high-end parameter set (10 percent recharge). The results of the model run (SM237transient) indicate a predicted maximum drawdown of about 28 feet, 20 feet, and 25 feet in the nodes representing Wells 1, 3, and 4 respectively after three years of pumping at 171,000 gallons per day (Table 3). Extraction rates would lower to 33 AFY during operation, and the cones of depression become much less steep but slightly wider in extent (Figure 8). The maximum drawdown would be approximately 1 foot at the closest bedrock interface east of the wells. The model results also indicate groundwater flow through the northeast outlet would be diminished by only one percent (from 424.8 AFY to 420.2 AFY, as shown in Table 4). This reduced flow through the northeast outlet would occur primarily during project operations.

Figure 7: Three Wells, 3 Years, High-end Parameters

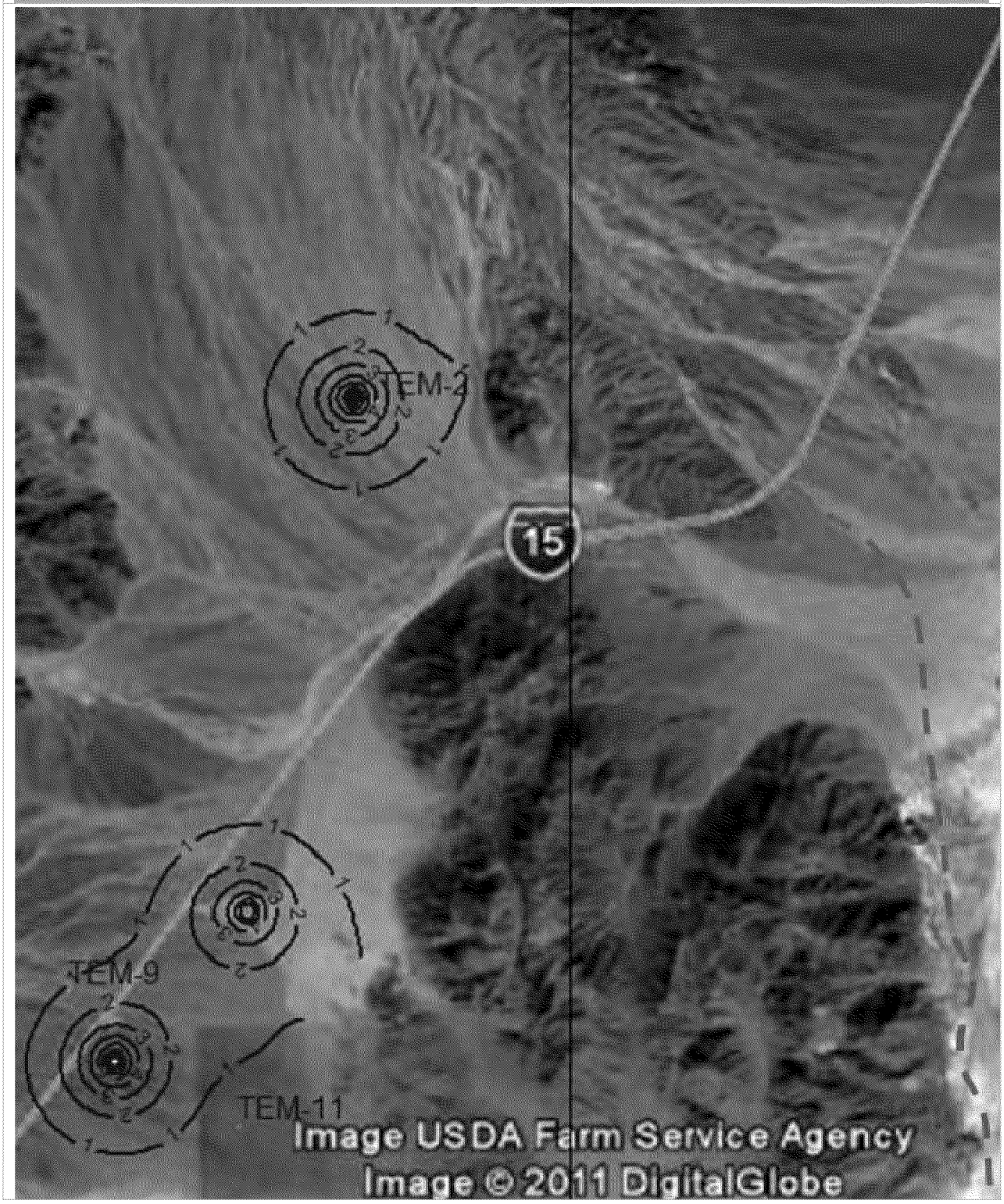
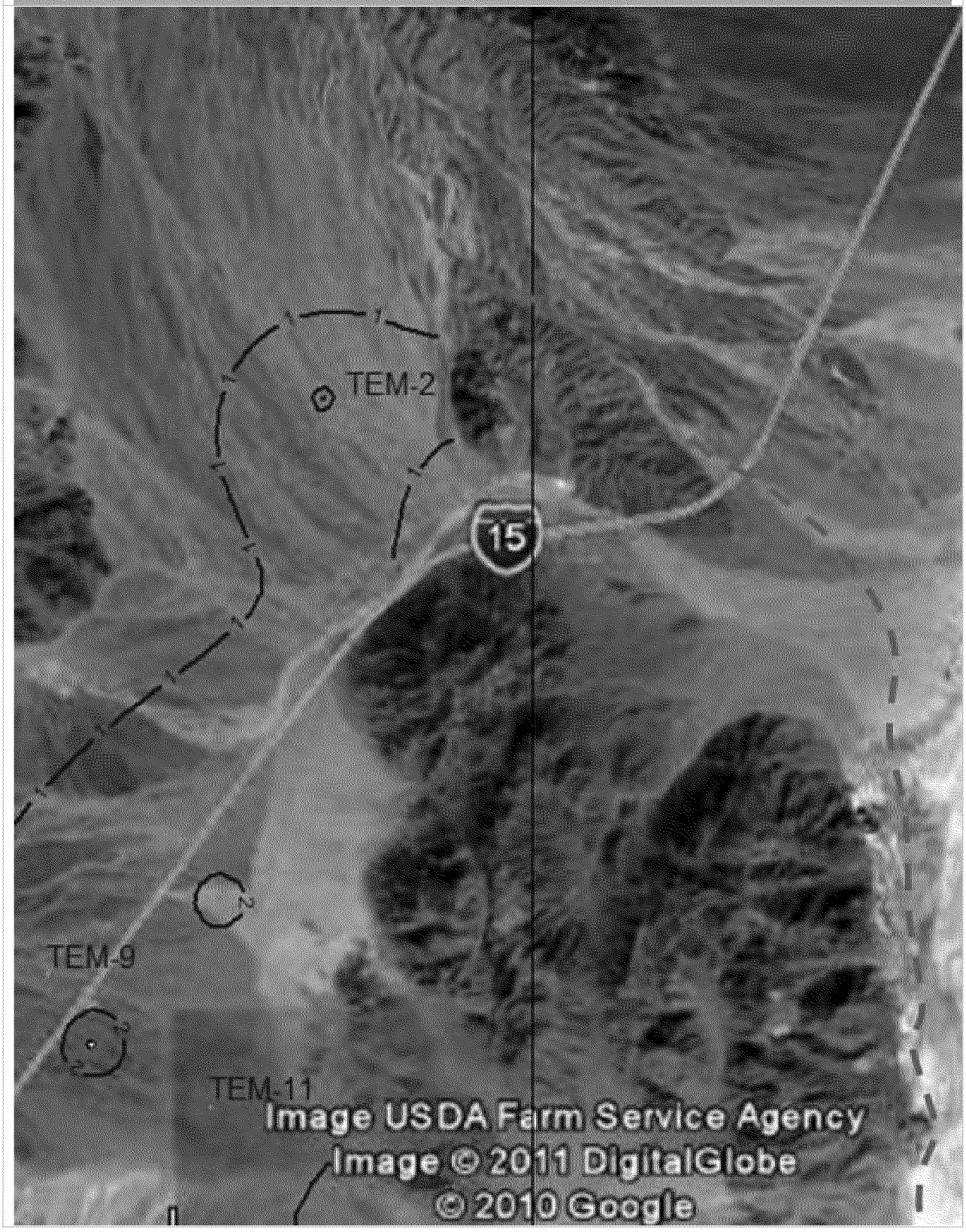


Figure 8: Three Wells, 30 Years, High-End Parameters



SMSP01326

Table 3: Summary of Results at Each Well Point			
Scenario	**Well 1 Drawdown (ft)**	**Well 3 Drawdown (ft)**	**Well 4 Drawdown (ft)**
3 Wells, 3 Years, High End	28	20	25
3 Wells, 30 Years, High End	5	4	5
3 Wells, 3 Years, Low End	110	68	91
3 Wells, 30 Years, Low End	16	12	15
1 Well, 3 years, High End	N/A	N/A	80
1 Well, 30 Years, High End	N/A	N/A	13
1 Well, 3 Years, Low End	N/A	N/A	Dry
1 Well, 30 Years, Low End	N/A	N/A	Not Modeled
Note: Model predicts declines in hydraulic head and does not account for well loss (head losses due to friction flowing through the well screen). Actual drawdown in the well is expected to be greater due to well loss.			

Table 4: Groundwater Discharge at Northeast Outlet of Soda Mountain Valley				
Model Scenario	**Discharge (AFY), After 3 Years**	**Reduction (AFY)**	**Discharge (AFY), After 30 Years**	**Reduction (AFY)**
High Recharge, Existing Conditions	**424.8**	**N/A**	**424.8**	**N/A**
High Recharge, 3 wells	422.2	2.6	420.2	4.6
High Recharge, 1 well	424.8	ND	424.3	0.5
Low Recharge, Current Conditions	**121.2**	**N/A**	**121.2**	**N/A**
Low Recharge, 3 wells	121.2	ND	118.9	2.3
Notes: ND = Not detectable. No change from existing conditions was measured by the model				

Three Wells, Low-End Parameter Set (3 Percent Recharge)

Figure 9 shows the drawdown predicted after three years of pumping at three wells, with a combined withdrawal of 192 AFY for the low-end parameter set (3 percent recharge). With low-end values of K and R, the predicted drawdown is much higher at the well point than with the high-end parameter set. The maximum predicted drawdown is approximately 110 feet, 68 feet, and 91 feet in the nodes for Wells 1, 3, and 4 respectively (Table 3). The model run (SM240transient2) indicates the maximum drawdown at the closest bedrock interface east of the wells would be less than 1 foot after 3 years of construction. The cones of depression would become much less steep and would not spread significantly during operation (Figure 10).

Figure 9: Three Wells, 3 Years, Low-End Parameters



Figure 10: Three Wells, 30 Years, Low-End Parameters



SMSP01329

The maximum predicted drawdown is less than 1 foot at the closest bedrock interface to the east of the wells. The model also predicts that there would be an approximately 2 percent reduction in groundwater flow through the northeast outlet during operation (from 121.2 AFY to 118.9 AFY).

One Well, High-End Parameter Set (10 Percent Recharge)

Figure 11 shows the resulting drawdown predicted around a water supply well after three years of pumping at one well (W-4) of 192 AFY with the high-end parameter set (10 percent recharge). The results from the model run (SM250hiR-tr) indicate a predicted maximum drawdown of about 80 feet in the node representing Well 4 after three years of pumping at 171,000 gallons/day during the construction phase (Table 3). The cone of depression would become much less steep but somewhat wider in extent during operation (Figure 12). The results indicate the maximum drawdown at the closest bedrock interface east of the wells would be approximately 2.2 feet. The model also indicates groundwater flow through the northeast outlet would decrease by approximately 0.1 percent from 424.8 AFY to 424.3 AFY. This reduced flow through the northeast outlet would occur primarily during the period of operations.

One Well, Low-End Parameter Set (3 Percent Recharge)

The model results indicate that with the low-end parameter set, the node containing the well would go dry quickly once pumping begins. The results of the model run (SM260) indicate a single well would not be able to sustain the required extraction rate of 192 AFY during the construction phase. The 30-year, one-well scenario was therefore not modeled.

Figure 11: One Well, 3 Years, High-End Parameters



Figure 12: One Well, 30 Years, High-End Parameters



5 DISCUSSION

5.1 RECHARGE

NPS stated that recharge estimates used in the MODFLOW model were too high and could underestimate the potential impacts of groundwater withdrawals associated with the project. NPS suggested using the Maxey-Eakin method for estimating recharge would determine zero recharge and this should be used as the model input for the site.

The rationale for recharge values used in the original model, 0.125 inches per year to 0.5 inches per year, was discussed in detail in Section 3.2 of the Model Report (RMT 2011). Average annual precipitation was estimated to be 4 inches per year or more, based on data from PRISM Climate Group (2012) and Western Regional Climate Center (2013).

NPS's assertion that the Maxey-Eakin method should be used to estimate recharge has been questioned by other researchers. Bredehoeft (2007) notes that, while the Maxey-Eakin method is still useful in Nevada, it has many uncertainties. Davisson and Rose (2013) point out that the Maxey-Eakin method was calibrated to a drier climate in Arizona rather than areas in southern California, similar to the study area, and thus could lead to underestimates of recharge in this area. NPS's assertion that the recharge rate could be zero are unreasonable because a zero recharge rate in a basin this small would result in a dry basin with no groundwater. Geophysical evidence from this valley shows the presence of up to several hundred feet of saturated alluvium in the valley floor, which directly contradicts a recharge rate of zero (TerraPhysics 2010; Wilson 2011).

With relatively coarse-grained sediments overlying much of the valley floor (Wilson 2011; Diaz-Yourman and Associates 2010) and approximately 4 inches of rainfall per year in the valley and mountains (PRISM Climate Group 2012), it is estimated that 7.8 to 8.8 percent of the precipitation in the mountains becomes mountain front recharge (Panorama Environmental 2012). This estimate is comparable to the value of approximately 10 percent of runoff becoming recharge in the Mojave Desert (Izbicki 2002). Recharge rates presented in the project well permit application were estimated to be approximately 641 to 723 acre-feet per year (AFY), with much of it derived from mountain front runoff (Panorama Environmental 2012).

BLM staff suggested recharge rates ranging from 3 percent to 10 percent of precipitation (0.12 to 0.4 inches recharge per year) should be used in the revised model based on their experience elsewhere in arid and semi-arid regions of southern California. These estimates of recharge are slightly lower than the previous estimates of 0.125 to 0.5 inch used in the Model Report (RMT 2011). The low-end (3 percent) and high-end (10 percent) recharge rates used in the model provide a total input of 376 to 1,330 AFY of recharge (corresponding to 0.12 to 0.4 inches of recharge per year).

5.2 MODEL BOUNDARIES CONSIDER OUTFLOW TO EAST

NPS commented that the model incorrectly assumed impermeable boundaries that precluded flow to the east beyond the Soda Mountains.

The model boundaries were defined using geologic data and geophysical information. The Soda Mountain Valley is surrounded by low-permeability granitic and volcanic rock. The model covers the alluvium within the valley. The low permeability rocks define the model boundaries. The cross sections in the Model Report have been updated with geologic information from existing published geologic maps (Figure 3). The geologic cross sections illustrate the nature and extent of bedrock that forms the mountains in the area, and verifies that carbonate rocks, which might have solution openings and be more permeable than the typical bedrock, are not pervasive in the area. The model domain reflects the geologic conditions in the area by assuming no flow through the granitic and volcanic rock to the east and flow through an outlet to the east and an outlet to the south where alluvium is present.

Observed conditions at the site and in the regional groundwater system support the presence of low permeability through fractured bedrock in the Soda Mountain. The water table in the valley is situated approximately 200 to 300 feet above the surface of Soda Lake and substantial fracturing and groundwater discharge through the mountains would have drained the Soda Mountain Valley groundwater basin. As discussed previously, geophysical evidence shows the presence of several hundred feet of saturated alluvium in the valley (Terra Physics 2010).

The existing model incorporated focused discharge through two outlets from the valley, the northeast and the southeast outlets, that allowed groundwater to flow from the model domain to the east. The model simulated groundwater discharge into Soda Lake through these two outlets. The model was therefore not surrounded entirely with impermeable boundaries.

5.3 POTENTIAL FOR IMPACTS TO SODA SPRINGS AT ZZYZX AND MOHAVE TUI CHUB

NPS commented that the model did not adequately address potential impacts to Soda Springs at Zzyzx, habitat for the Mohave tui chub (*Siphateles bicolor* ssp. *Mohavensis*).

The U.S. Fish and Wildlife Service (USFWS) listed the tui chub as endangered in 1970. California Department of Fish and Wildlife (CDFW) lists the species as endangered and a fully protected species. The revised modeling presented in this addendum evaluated groundwater drawdown at two locations to assess potential impacts on Soda Springs at Zzyzx and associated tui chub habitat:

1. NPS's hypothesized preferential flow path (Figure 1)
2. The western edge of the Soda Mountains

5.3.1 Mohave Tui Chub Habitat Requirements

There are specific requirements for suitable Mohave tui chub habitat, including pool configuration, water temperature, water quality, and food sources. Pools should be at least 4

feet deep to resist cattails and to stabilize temperature and dissolved oxygen content. Aquatic plants are needed for attachment of eggs and to prevent anoxic conditions in the water. Vegetation (aquatic and riparian) also provides shade to protect the fish from extreme temperatures Temperature tolerance ranges from 37 to 97 degrees Fahrenheit (3 to 36 degrees Celsius). The tui chub cannot tolerate high salt content; therefore, there must be a flow of fresh water into the pool to counteract high evaporation rates in the desert. Insufficient water supply to existing populations is a threat to the viability of Mohave tui chub populations. Mohave tui chub feed on aquatic invertebrates (USFWS 2009).

5.3.2 Mohave Tui Chub Habitat Locations

The Mohave tui chub historically existed in the Mojave River. Today, there are only four known populations: China Lake, Soda Springs and Lake Tuendae at Zzyzx, CDFW's Camp Cady Wildlife Area, and the Deppe Pond. There is no suitable habitat for Mohave tui chub within the Soda Mountain Valley.

Lake Tuendae

Lake Tuendae is an approximately 1.5-acre man-made lake approximately 800 feet northwest of Soda Springs. Evapotranspiration rates at the Lake were measured by Barthel (2008) based on groundwater withdrawal to support the lake. The pumping rate to support the Lake and adjacent vegetation is 9.27 million gallons per year (28.5 AFY) (Barthel 2008). The Lake is located within an approximately 2 acre watershed and the rate of evapotranspiration was therefore estimated to be 14.25 feet per year over each acre (28.5 AFY/2 acres = 14.25 feet per year) (Barthel 2008). Lake Tuendae supports a population of 1,318 Mohave tui chub (Barthel 2008). This population was introduced to the Lake. The Lake is approximately 3.1 feet deep and the level is managed by the Desert Studies Center to ensure adequate water depth for the tui chub and Saratoga Springs pupfish (also introduced) (Barthel 2008). Lake Tuendae is a managed system and lake levels are maintained by pumping groundwater rather than natural groundwater discharge.

Soda Springs at Zzyzx

Soda Springs at Zzyzx is a natural spring that discharges into an oval shape pond which supports a population of 255 Mohave tui chub. The pond at the spring outlet is approximately 13 feet by 16 feet wide (0.005 acre) and supports vegetation within a 0.4-acre watershed (Barthel 2008). The depth of the spring is approximately 6.5 feet with a total volume of 8,300 gallons. The estimated evapotranspiration from Soda Springs at Zzyzx and the surrounding phreatophytic vegetation is approximately 5.7 AFY (0.4 acre x 14.25 feet per year = 5.7 AFY of evapotranspiration) with approximately 0.07 AFY of evaporation from the pond surface (0.005 acre x 14.25 feet per year = 0.07 AFY).

Observations by Barthel (2008) indicate the water level in the pond has been constant during a year of measurements, apparently unaffected by pumping in the alluvial aquifer production well located near the spring. This finding is consistent with results of the production well testing at up to 200 gallons per minute that indicate the alluvial aquifer is highly permeable and

transmissive, at approximately 400,000 gpd/ft^2 (Archbold 1994). This also suggests that there is ample flow of water in the permeable alluvial aquifer to sustain water levels in Soda Springs.

5.3.3 Groundwater Outflows

Groundwater outflows at Lake Tuendae, Soda Springs, and the Desert Studies Center are summarized in Table 5.

Table 5: Groundwater Use at Zzyzx

Location	Use	Amount (acre-feet per year)
Lake Tuendae	Evapotranspiration from approximately 2-acre watershed	28.5
Desert Studies Center	Pumped into pool and reservoir	4.0
Soda Springs at Zzyzx	Evapotranspiration from 0.4-acre watershed	5.7
Total		**38.2**
Note: Evapotranspiration rate is 14.25 feet per year		

Source: Barthel 2008

5.3.4 Source of Soda Springs at Zzyzx

Local Recharge

Research conducted at the Desert Studies Center indicates that Soda Springs at Zzyzx is recharged locally by water flow from alluvial fan deposits. Vargas (2012) showed that water from the spring was similar in stable isotopes and inorganic chemistry to water on the alluvial fan on the east side of the Soda Mountains. The determination was made after analysis of water quality samples from a well located approximately 500 feet west of the spring. The spring water differs substantially from shallow groundwater from the nearby playa of Soda Lake in isotope geochemistry and major ion chemistry. The spring thus does not appear to be recharged from groundwater from the playa area.

The water quality data indicate that the spring is sustained by water that originates locally on the eastern side of the Soda Mountains, infiltrating the alluvial fan sediments and flowing toward the spring under semi-confined conditions (Barthel 2008; Vargas 2012). It is likely that a broad area of alluvial fan sediments on the eastern edge of the Soda Mountains contributes recharge water to the spring flow, based on the age of the water (mostly pre-1950 based on tritium data [Vargas 2012]). The area of local recharge along the eastern face of the South Soda Mountains is approximately 2,600 acres. Assuming that 3 to 10 percent of rainfall becomes recharge, local recharge is in the range of 26 AFY to 86.7 AFY. The combined groundwater withdrawal at the Desert Studies Center, Lake Tuendae, and discharge at Soda Springs is approximately 38.2 AFY (Table 5). Local recharge is therefore sufficient to support all, or the majority of groundwater withdrawal and discharge at Soda Springs and Lake Tuendae.

SMSP01336

Soda Mountain Valley Groundwater Outflow

Groundwater outflow through the northeast and southeast outlets of the Soda Mountain Valley is also thought to contribute additional recharge to the alluvial fans east of the Soda Mountains (Hughson 2013). This outflow from the valley may flow towards the Soda Lake Playa and evaporate off the playa, or it may combine with local recharge on the east side of the South Soda Mountains and flow towards Soda Springs. NPS hypothesizes that there is a mountain-front fault on the eastern side of the south Soda Mountains. Discharge from the valley may follow permeable rocks along the fault line as a preferential flow path, shown in Figure 1 (Appendix A). Groundwater outflow from the eastern outlet of the Soda Mountain Valley is estimated in the groundwater flow model for existing (steady-state) conditions to be 121.2 AFY with low-end recharge and 424.8 AFY with high-end recharge. Assuming that this flow contributes to local recharge and flows to the spring, the total combined groundwater flow from the eastern side of the Soda Mountains and Soda Mountain Valley groundwater outflow that is available at the spring is 147.2 AFY to 511.5 AFY.

5.3.5 Potential Impacts to Soda Springs Groundwater Levels

Reduced Flow out of the Soda Mountain Valley

Model results indicate that under any scenario, the discharge of groundwater from the Soda Mountain Valley through the northeast outlet would be diminished only slightly by the Project. The maximum potential reduction in flow is modeled to be 4.6 AFY or less after 30 years of pumping three wells under high recharge, equivalent to about 2 percent or less of the current outflow[1]) as shown in Table 4, with a lower level of reduction of 2.6 AFY (0.6 percent reduction) or less during the three-year construction period for the Project. The groundwater discharge from the Soda Mountain Valley would continue to follow the current flowpath, including potential flow down the alluvial fans along the east side of the Soda Mountains.

A groundwater budget for Soda Springs and Lake Tuendae was prepared to estimate the impact of the reduced outflow from the Soda Mountain Valley on Soda Springs (refer to Table 6). It is assumed in the groundwater budget that the Soda Mountain Valley is a source of groundwater for Soda Springs and Lake Tuendae. The groundwater budget indicates there is more than adequate groundwater flow from local recharge and outflow from the Soda Mountain Valley under project conditions to support existing groundwater use at Soda Springs and Lake Tuendae. There is surplus groundwater flow in excess of 100 AFY that drains to the Soda Lake playa under all scenarios. This analysis is supported by aquifer test results at Zzyzx that indicate there is ample flow of water in the permeable alluvial aquifer to sustain water levels in Soda Springs, as discussed previously. The minor reduction in outflow from the Soda

[1] Discharge was determined as an output of the calibrated model and each model scenario.

SMSP01337

Mountain Valley as a result of project groundwater use would therefore have no impact on groundwater flow at Soda Springs or groundwater withdrawal for Lake Tuendae.

Table 6: Groundwater Budget

Element	Low-End Recharge Scenario (AFY)	High-End Recharge Scenario (AFY)
Potential Inflows to Soda Springs and Lake Tuendae		
Local Recharge	26.0	86.7
Soda Mountain Outflow	121.2	424.8
Direct Precipitation on Soda Springs and Lake Tuendae	0.7*	0.7*
Subtotal Inflows	147.9	512.2
Outflows		
Groundwater Use at Zzyzx	38.2*	38.2*
Reduction in Groundwater Flow Due to Project Pumping	2.3	4.6
Subtotal Outflows	40.5	42.8
Surplus Groundwater Flow (Flows to Soda Lake)	**107.4**	**469.4**
*Source: Barthel 2008		

Potential Impacts from Groundwater Table Decline at Western Edge of South Soda Mountains

It is highly unlikely that the volcanic bedrock forming the Soda Mountains and sidewalls of the Soda Mountain Valley are permeable enough to allow for a significant outflow of groundwater from the valley. Groundwater levels in the valley are approximately 1232 feet amsl at TEM-02, and 1170 feet amsl at TEM-09, and thus are over 200 feet higher than groundwater levels near Soda Springs (Barthel 2008; Vargas 2012). If there were substantial discharge through the bedrock, elevated groundwater levels could not be maintained in the valley over 200 feet higher than the water level near Soda Springs adjacent to the Soda Lake playa; the Soda Mountain Valley groundwater basin would drain.

Groundwater modeling results presented here indicate that drawdown of water levels near the edge of the valley adjacent to the west flank of the south Soda Mountains would generally be less than 2 feet at any time during construction or operation. The small drawdown at the edge of the valley would attenuate to negligible levels over the 3 miles of bedrock separating the valley from the Soda Springs area at Zzyzx. In comparison, groundwater levels in monitoring wells near Zzyzx fluctuate naturally by 1 to 2 feet with no effect on the level of Soda Springs (Barthel 2008).

5.3.6 Potential Impacts to Groundwater Quality

The withdrawal of groundwater for the project would not affect groundwater quality in the Soda Mountain Valley or at Zzyzx. Groundwater use would have a minor impact on groundwater levels in the Soda Mountain Valley (as discussed previously) and would not introduce contaminants to the groundwater system or change the chemistry of the groundwater. Construction and operation of the project would involve the use of hazardous materials that could potentially impact water quality (e.g., diesel fuel, solvents, etc.). These hazardous materials would be contained and managed in accordance with State regulations to prevent spills.

SMSP01339

6 CONCLUSIONS

6.1 WATER AVAILABILITY AND NUMBER OF WELLS

The groundwater pumping simulations show that that there is adequate groundwater in the Soda Mountain Valley to support construction and operation of the solar project without adversely affecting nearby wells or sensitive resources. The model scenarios included scenarios with use of one well and scenarios with use of three water supply wells; however, current plans are to have two or three extraction wells to provide adequate water supply and a backup well for reliability. The results of the single-well scenario indicate that a single well could support construction water demand with high-end recharge but would be inadequate under a low-end recharge and low-end hydraulic conductivity scenario. The simulations show that three wells would supply an adequate amount of water for construction under all scenarios. It is recommended that an aquifer test be completed after construction of the first well to assess hydraulic properties of the aquifer. If the hydraulic properties are towards the lower end of the modeled range, three wells should be constructed for project water supply. If the hydraulic properties are towards the upper end of the modeled range, only two wells would be needed for the project.

6.2 EFFECTS OF GROUNDWATER PUMPING

The proposed use of water for construction and operation of the project is within the safe yield of the Soda Mountain Valley (Panorama 2013). The low-end recharge rate of 376 AFY would exceed annual project water demand of 192 AFY for the 3 years of construction. The operation pumping of 33 AFY is also within the safe yield with the low-end recharge rate. Groundwater pumping simulations conducted using both the low-end and high-end recharge rates and hydraulic conductivity values indicate a decline in the groundwater table of less than 1 foot to approximately 2 feet at the nearest bedrock interface east of the wells after 3 years of construction and over the operational period of the project.

This groundwater level decline would attenuate over the 3 miles of bedrock between the project wells and Soda Springs and is expected to be negligible at Soda Springs. Moreover, model results indicate the outflow of groundwater from the Soda Mountain Valley northeast outlet would be reduced during construction and operation by 4.6 AFY or less due to groundwater use for the project. Groundwater outflow from the Soda Mountain Valley would return to pre-existing conditions after decommissioning of the project.

6.3 EFFECTS TO SODA SPRINGS AT ZZYZX

There are approximately 3 to 4 miles of bedrock separating the project groundwater wells from Soda Springs. A drawdown of 2.2 feet or less at the nearest bedrock interface is not expected to propagate to a distance of over 3 to 4 miles, particularly through the granitic and volcanic bedrock that comprises the South Soda Mountains. The presence of low permeability bedrock between Soda Springs and the project valley indicate that there would be no change in groundwater levels at Soda Springs as a result of 2.2 feet or less of drawdown at the bedrock interface on the west side of the South Soda Mountains. Modeling results presented in Section 4 indicate the reduction in groundwater flow out of the northeast outlet of the Soda Mountain Valley to a preferential flow path along the east face of the south Soda Mountains would be less than two percent of current outflow (reduction of approximately 4.6 AFY or less) under all model scenarios (Table 4). The analysis of local recharge presented in Section 5.1.3 showed that there is likely sufficient local recharge on the east side of the South Soda Mountains to support discharge at Soda Springs and current groundwater withdrawal at the Desert Studies Center. It is uncertain whether the outflow from the Soda Mountain Valley contributes to groundwater flow at Soda Springs or whether the source of groundwater for Soda Springs is entirely local recharge on the east side of the south Soda Mountains. The outflow from the Soda Mountain Valley may flow east towards the Soda Lake playa rather than south towards Soda Springs at Zzyzx.

Approximately 5.7 AFY of groundwater inflow are needed to balance the evapotranspiration rate in Soda Springs, and 32.5 AFY of groundwater pumping to support Lake Tuendae and groundwater use at the Desert Studies Center Barthel (2008). Assuming that outflow from the Soda Mountain Valley contributes to groundwater flow at Zzyzx, there is a surplus of over 100 AFY of groundwater needed to support current groundwater use at Zzyzx under all model scenarios (Table 6). The potential impact from the project groundwater pumping on Soda Springs would therefore not be measurable or discernible from baseline water level in the Springs.

Pumping of groundwater into Lake Tuendae, located close to Soda Springs, has apparently had no significant effect on spring flow. Barthel (2008) reports that 32.5 AFY of groundwater was pumped from a well in the alluvial aquifer during a 1-year period. During this period, there was no impact to the water level in Soda Springs, which is located approximately 800 feet from the well. This also indicates that the natural flow of groundwater to Soda Springs is robust (Barthel, 2008). The results of the revised groundwater modeling support the conclusion that potential impacts of groundwater extraction for the project on Soda Springs would be negligible.

7 RECOMMENDATIONS

The following measures were developed based on the results of groundwater modeling for the Soda Mountain Solar Project.

Groundwater 1: Soda Mountain Solar will construct a test well within observation wells and a distance observation well within the project ROW prior to project construction. The distance observation well shall be located approximately 1,000 feet from the test well and within the alluvial aquifer underlying the project site. The exact location of the test and observation wells will be determined by a professional hydrogeologist or geologist. A test plan will be submitted to San Bernardino County and BLM a minimum of 14 days prior to performing the aquifer test. The aquifer test shall be conducted upon completion of the test and observation wells for a minimum of 72-hours, or as determined by the professional hydrogeologist or geologist. During the aquifer test, groundwater shall be discharged from the test well at a rate of approximately 200gpm (equivalent to maximum project demand of 300,000 gpd). The necessary permit(s) shall be obtained from the Regional Water Quality Control Board prior to the discharge of groundwater.

Groundwater 2: The aquifer test data shall be analyzed by a professional hydrogeologist or geologist. The professional hydrogeologist or geologist will determine the number of project water supply wells required for the project by calculating the estimated drawdown in two wells using the actual aquifer parameters from the 72-hour aquifer test (see Groundwater 1, above) and the maximum pumping rate of approximately 300,000 gpd for a period of 3 years. If one or more of the wells are expected to run dry at the maximum pumping rate, a third well will be required for the project.

Groundwater 3: A water quality sample will be collected from the test well and analyzed for total dissolved solids (TDS) by a State of California certified laboratory. The results will be evaluated by the project engineer to determine the need for a reverse osmosis facility to treat the water for panel washing.

Groundwater 4: The groundwater model will be recalibrated using the measured aquifer properties resulting from the 72-hour aquifer test (see Groundwater 1, above). If the results of the recalibrated model indicate that reduction in outflow from the valley would be less than 50 AFY under proposed project conditions, then no further action will be taken. If the recalibrated model predicts reduced outflow from the northeast outlet of the Valley in excess of 50 AFY, Groundwater 5 will be implemented.

Groundwater 5: The Applicant will hire a professional hydrogeologist or geologist to develop a groundwater monitoring plan for submittal to and acceptance of BLM and San Bernardino County if the recalibrated model predicts reduced outflow from the northeast outlet of the

Valley in excess of 50 AFY, as described in Groundwater 4. The groundwater monitoring plan would include monitoring and quarterly reporting of groundwater levels within the Soda Mountain Valley, in the alluvial aquifer adjacent to Soda Springs at Zzyzx, and at Soda Springs at Zzyzx during construction of the project. If the project is shown to cause a decline in groundwater levels is 5 feet or more in the alluvial aquifer near Soda Springs or there is a decrease in groundwater discharge at Soda Springs that threatens the tui chub as a result of project groundwater withdrawal, an evaluation would be conducted to determine if the project is causing reduced groundwater discharge at Soda Springs. If it is determined that the project has caused a decrease in the volume of groundwater discharged at Soda Springs then the project shall curtail or, if necessary, cease withdrawal of groundwater and import a corresponding amount of water from outside of the Soda Mountain Valley.

Groundwater level measurements in the monitoring wells located in the Soda Mountain Valley would be compared to the model predictions on an annual basis during construction and every 5 years during project operation. The groundwater model would be recalibrated if the measured drawdown values in the monitoring wells exceed the predicted values by more than 15 percent. Monitoring would cease after 5 years of operational monitoring if two conditions are met:

- The monitoring data support the model predictions.
- The model predicts the reduction in outflow from the northeast outlet will be less than 50 AFY under proposed project conditions, as detailed in Groundwater 4.

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Appendix A

United States Department of the Interior

NATIONAL PARK SERVICE
Mojave National Preserve
2701 Barstow Road
Barstow, California 92311

RECEIVED
BUREAU OF LAND
MAIL ROOM
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CALIF. DESERT DISTRICT
MORENO VALLEY, CA

In Reply Refer To:
1.B. Temporary (long-term) (Formerly L3215) (MOJA)

November 21, 2012

Mr. Matthew Slowik
Senior Planner
San Bernardino County
Land Use Services Dept., Planning Division
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182

Dear Mr. Slowik:

Mr. Jeffrey Childers
Project Manager
Bureau of Land Management
California Desert District Office
22835 Calle San Juan de Los Lagos
Moreno Valley, CA 92553

Dear Mr. Childers:

The National Park Service (NPS) appreciates the opportunity to comment on the Notice of Intent/Preparation (NOI/NOP) of the Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Soda Mountain Solar Project (project). NPS supports renewable energy projects on public lands as long as such projects can be constructed and operated in an environmentally responsible manner that serves the public interest, protects natural resources, and protects our treasured landscapes. It is the role of NPS to contribute to the process and the analysis of renewable energy projects to help ensure that they meet the Secretary's goal that such projects on public lands are "Smart from the Start." Our goal is to provide expertise and practical and specific feedback in order to avoid significant adverse impacts to the resources of Mojave National Preserve (Preserve).

NPS has reviewed the project description, location, and potential environmental effects as described in your NOI/NOP dated October 23, 2012, and October 26, 2012. Our comments are as follows:

NPS has significant concerns related to potential project impacts to two federally listed endangered species, one California species of special concern, loss of wildlife connectivity and potential habitat de-fragmentation, viewshed degradation, air quality, storm water management, and hydrogeology and groundwater. The proximity of the proposed Soda Mountain Solar Project to the Preserve is less than one mile. Direct and indirect impacts associated with the project have potential to impact park resources significantly that have been mandated by Congress in the Organic Act of 1916 and the California Desert Protection Act of 1994 (PL 103-433 §2) to be protected by the Preserve.

Hydrogeology and Groundwater

During construction, the project proponent intends to pump approximately 60 acre-feet per year followed by approximately 6 acre-feet per year for operations during the life of the project. The

Hydrogeologic Conditions and Groundwater Modeling Report (RMT Inc. 2011) submitted by the project proponent inadequately addresses potential impacts to the springs at Zzyzx that are habitat for the endangered Mohave tui chub. The report supports the proposal to pump groundwater from the alluvial sediments underlying the project site and lacks subsurface data from boreholes on groundwater levels or geologic formation properties. It assumes an overly high recharge rate for this low-elevation area, incorporates unsupported assumptions in the model, does not account for the possibility of permeable bedrock, and neglects to account for potentially adverse impacts to the springs at Zzyxz that are habitat for the endangered Mohave tui chub.

The groundwater flow model employed a distributed recharge rate ranging between 0.125 and 0.5 inches per year (3.5% - 14% of direct precipitation) and a recharge rate 26 times greater at the boundary nodes on the assumption that mountainous areas act as precipitation collectors and funnel precipitation directly into the subsurface. Based on these assumptions, total recharge was calculated at a range of 343 to 1,373 acre-feet per year (af/y) over an area of 33,000 acres. These assumptions likely substantially overestimate the actual recharge rate for the project area. For example, the Maxey-Eakin method commonly used for estimating recharge in this arid region, would predict about zero recharge at this low an elevation. Recharge efficiency (percent of total precipitation that enters the subsurface as aquifer recharge) for total annual precipitation in the range of 10 cm/year that occurs in the project area is likely less than 3% and probably closer to zero (Dettinger 1989). Other groundwater studies in the eastern Mojave Desert (e.g. Izbicki et al. 1995) show groundwater with carbon-14 dates in the range of 20,000 years before present; this indicates very low to no modern recharge. The model used to estimate impacts from groundwater pumping for this project (RMT Inc. 2011), however, simply assumed a recharge rate and used it to calibrate the parameters of a flow model with no actual measured formation properties for comparison or analyses of recharge using accepted methodologies. The baseline model assumes impermeable, no-flow boundaries in the Soda Mountains and underlying bedrock. The only subsurface data presented in the report, however, comes from an existing well in fractured bedrock, which does not support the assumption of impermeable bedrock. This well near Rasor was drilled to 760 feet and produces up to 1,500 gallons per day (RMT Inc. 2011).

The Soda Springs at Zzyzx lie less than one mile from the Soda Mountain Solar project site and include MC Spring, which is habitat for the source population of the endangered Mohave tui chub (*Siphateles mohavensis bicolor*). The Mohave tui chub is listed as endangered under both the federal Endangered Species Act and the California Endangered Species Act. The no-flow boundary assumptions used in the model preclude analyses of potential effects of groundwater pumping on this spring-fed habitat. For example, one possible source of recharge for Soda Springs is the mountains west of the project site. One possible flow path for this recharge is through the location of the proposed pumping, along the northerly end of the Soda Mountains, and then along the westerly edge of Soda Dry Lake following the permeable beach and colluvial sediments at the playa margin. Pumping at the proposed project location might extract groundwater that would otherwise discharge from the springs. Estimates of groundwater discharge at Zzyzx are in the range of 50 af/y (Barthel 2008), less than the amount proposed to be pumped by the project during the construction phase. The groundwater modeling report does not address this potential flow path, and data used to support the model are limited to surface electrical resistivity surveys. The groundwater modeling and analyses need to be based on actual

field data, including recharge estimates obtained by accepted methods (e.g. chloride mass balance) and subsurface data from boreholes on groundwater levels and aquifer formation properties. Project analysis should consider alternatives to the water use described in the project proposal. The proponent should consider alternatives to groundwater pumping, such as use of dust palliatives, panel cleaning by air blowing, dust cloths, or other means.

For each facility site with a drainage system crossing it, the proponent should include a map identifying all surface water resources within the vicinity and include a narrative discussion of the delineation methods used to discern those surface waters in the field and what modifications would occur from project implementation. Specific information regarding the potential impacts to surface waters should be addressed, including both permanent and temporary impacts. Alternatives and mitigation measures to reduce and/or eliminate such impacts should be addressed. If impacts are unavoidable, then impacts need to be minimized, with the project designed such that it would maintain existing hydrologic features and patterns. All unavoidable impacts should be mitigated to ensure no net loss of function and value as the result of project implementation.

Storm water management needs to be considered as a significant component in the project design and implementation. In particular, storm water runoff collects into channels and natural drainage systems. Without adequate design, the consequences of combining these flows will likely be aggradation and head-cutting upstream of the confluence and channel incision, increased sediment transport, and eventual widening downstream of the confluence. The proponent needs to evaluate all potential storm water impacts, describe controls needed during construction, mitigation necessary for potential post-construction hydrologic impacts, and describe specific best-management practices that, when implemented, would reduce those potential impacts to insignificant levels. Where feasible, consideration should be given to design alternatives that maintain the existing hydrology of the site and/or redirect excess flows created by hardscapes and reduced permeability from surface waters to areas where they will dissipate by percolation into the landscape. All potential impacts associated with changes in drainage patterns, changes in water volume, velocity, quantity, quality, soil erosion and sedimentation in streams and water courses on or near the project site need to be modeled and analyzed. Mitigation measures to alleviate such impacts shall be included in the project proposal and environmental documents. The practice of channelizing, straightening, and lining streambeds would change a stream's hydrology by decreasing water storage capacity and increasing water flow velocity, and this, in turn, would lead to increases in the severity of peak discharges. These hydrologic changes can exacerbate flooding, erosion, scouring, and sedimentation, and could lead to loss of natural functions and values.

Biological Resources

The construction site for the proposed project includes desert tortoise habitat modeled by the U.S. Geological Survey to be high quality, in the range of 0.7 to 0.9 on a scale of 0 to 1 (Nussear et al. 2009). Recent population collapses, perhaps due to disease and/or drought (Tracy et al. 2004), make location of cryptic desert tortoises (*Gopherus agassizii*) even more difficult. Thus, absence of live tortoise observations during relatively brief field surveys, as reported by the project proponent, should not be used as justification for destruction of otherwise high-quality

habitat as this would preclude the possibility for recovery of tortoise populations in the area and reoccupation of habitat.

The Soda Mountains are habitat for a recently established herd of desert bighorn sheep (*Ovis canadensis nelsoni*). This herd established itself at the Soda Mountains without human intervention with the source population unknown. Even in the absence of an active sheep population, however, the Soda Mountains are a high priority for desert bighorn sheep conservation (John Wehausen, personal communication, 2012) due to the presence of a number of significant bridges under Interstate 15 that serve as rare and important opportunities for gene flow between the northern and north-central bighorn sheep metapopulation segments (Epps et al. 2007). Construction of the proposed solar energy project would preclude desert bighorn sheep gene flow to the north under Interstate 15 as well as to the south with the population in the Cady Mountains. Further fragmentation of the habitat is likely to irreversibly harm the viability of species metapopulations. High mountain habitat is no longer adequate to support permanent populations of sheep (Bleich et al. 2005). All areas used by sheep, including the lower elevation habitat connecting mountain ranges, are essential for the long-term survival of the species.

The Soda Mountain Solar project might also impact other wildlife, including raptors, song birds, and bats. A two-year or longer inventory, depending on environmental conditions, utilizing accepted protocols is needed to identify all potentially impacted species. Modeling techniques should be used to estimate flight patterns and periods of use of birds and bats and to identify potential impacts and potential mitigations. The project should identify significant direct and indirect loss of plant and wildlife habitat from all aspects of the project, including installing towers, constructing, improving, or re-routing roads, burying lines, and constructing ancillary facilities. This analysis needs to identify impacts to all species during each season. Species should include locally unique species, rare natural communities, wetlands, threatened and endangered species, California threatened, endangered, and species of special concern. The inventory needs to list all species present in the project area and include a distribution map with potential migratory and dispersal routes. It should demonstrate how the project will affect wildlife and plant distributions under each alternative. The analysis needs to address the potential loss of wildlife connectivity, include impacts from non-native and invasive plants, and address the association of invasive plants with disturbance, including the cumulative effects of the Rasor Off-Highway Vehicle Area and other disturbed areas.

The project proponent needs to develop a salvage plan for any special-status plants or species associated with habitat loss in the project area. Plant salvage needs to address, at a minimum, location of the mitigation site, plant species, schematic of the mitigation area, schedule, exotic vegetation control, planned monitoring, and plans for long-term conservation of the mitigation site.

Physical Resources

Mojave National Preserve is renowned for its dark night skies. NPS manages the Preserve to protect this valued and increasingly rare resource. The General Management Plan for the Preserve identifies as a resource protection goal "to partner with communities and local government agencies to minimize reflected light and artificial light intrusion on the dark night

sky". All exterior lighting should comply with International Dark-Skies standards and should be hooded to prevent light from shining up into the sky and shielded and directed to aim it at the places where it is needed to prevent light from spilling off the site. Low-pressure sodium lamps and fixtures of a non-glare type are required.

Potential impacts to all visual and natural sound need to be evaluated and analyzed. The scenic vistas associated with Mojave National Preserve are considered unique, as described in the California Desert Protection Act of 1994 (PL 103-433 §2). An assessment of visual impacts must include analyses of scenic vistas from specific key observation points, both towards the Preserve and from the Preserve towards the project site. In order to protect the natural soundscapes of Mojave National Preserve, analyses are needed of noises created during both the construction and operation phases of the project, including timing, intensity, duration, frequency spectrum, and impacts to both people and wildlife. Soundscape assessment needs to address the number of vehicle trips per day for delivering personnel, equipment, and supplies to the project during both construction and operational phases of the project. Construction and operation traffic could affect wildlife, soundscapes, and air quality. A traffic study needs to address project impacts to the roads and surrounding environment and to address mitigation measures needed to reduce the impacts. Such analysis should be consistent with the California Department of Transportation's Guide for the Preparation of Traffic Impact Studies.

An analysis of ambient air quality according to the National Ambient Air Quality Standards is needed, including potential air quality impacts of the proposed project (cumulative and indirect impacts). The analysis needs to identify all potential impacts from temporary or cumulative degradation of air quality. It should describe and estimate air emissions from potential construction and maintenance activities and propose avoidance or minimization measures. Emission sources should be identified by pollutant from mobile sources, stationary sources, and ground disturbance. The environmental analyses should include a Construction Emissions Mitigation Plan that addresses degradation of air quality and wilderness values.

A Fugitive Dust Control Plan should be prepared. Dust is the primary source of PM-10 (Particulate Matter 10 microns or smaller) pollution in the Mojave Desert. The environmental analyses needs to model the sources of dust that presently occur from the project area, then show their timing, duration, and transport on- and off-site. Modeling should also identify variations during construction and operational phases of the project for each alternative. Human health and the environment of sensitive receptors should be protected during any construction or demolition activities. If necessary, a health risk assessment should be conducted to determine if there are, have been, or will be, any releases of hazardous materials that might pose a risk to human health or the environment.

Cumulative Impacts

Direct and indirect cumulative impacts need to be analyzed as they apply to both the project site and the greater vicinity. Plans for past, present, and anticipated future projects should all be analyzed relative to their impacts to Mojave National Preserve.

The Soda Mountain Solar project has potential for causing significant impacts to Mojave National Preserve. Potential impacts include decreased spring discharge at Zzyzx as a consequence of groundwater pumping, loss of habitat for the endangered Mohave tui chub, loss of high-quality desert tortoise habitat, increased habitat fragmentation for desert bighorn sheep, and loss of important conservation opportunities. In addition, there are potential impacts from the project to air quality, storm water management, and scenic vistas. We believe that the environmental analysis of these potential impacts has been inadequately addressed in the documents provided by the project proponent.

If you have any questions, feel free to contact Mr. Ted Weasma at (760) 252-6106 or at ted_weasma@nps.gov.

Sincerely,

Stephanie R. Dubois

Stephanie R. Dubois
Superintendent

cc:
Greg Miller, BLM, California Desert District
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Soda Mountain Solar Project

Water Supply Report for the Soda Mountain Subbasin of the Soda Lake Valley Groundwater Basin

prepared for

Soda Mountain Solar, LLC
2925 Richmond Avenue, Eleventh Floor
Houston, Texas 77098

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July 2025

RINCON CONSULTANTS

Table of Contents

Table of Contents i
Acronyms iii
Report Authors iii
Executive Summary 1
1 Introduction 2
1.1 Previous Analysis 2
1.1.1 Soda LVGB 2
1.1.2 Silver LVGB 3
2 Project Location and Description 7
2.1 Location and Setting 7
2.2 Project Description 7
3 Groundwater Management Considerations and California Energy Commission Guidelines 9
3.1 Sustainable Groundwater Management Act 9
3.2 Porter-Cologne Water Quality Control Act 9
3.3 Desert Groundwater Management Ordinance 10
3.4 California Desert Conservation Area Plan 11
3.5 California Energy Commission Requirements 11
4 Groundwater Basin and Climate 14
4.1 Climate 14
4.2 Soda Lake Valley Groundwater Basin 14
4.3 Soda Mountain Subbasin 15
4.3.1 Inflow/Outflow 15
4.3.2 Groundwater Levels 16
4.3.3 Subbasin Storage 16
4.3.4 Safe Yield 16
4.4 Groundwater Quality 18
4.4.1 Current Water Quality 18
5 Project Water Demand 20
5.1 Construction Water Demand 23
5.2 Operation and Maintenance Water Demand 23
5.3 Decommissioning Water Demand 23
6 Impact Analysis 24
6.1 Water Availability 24
6.1.1 Groundwater Levels 24
6.1.2 Safe Yield 25
6.1.3 Total Groundwater in Storage 25

SMSP01356

7 Conclusions 27
8 References 29

Tables

Table 1 CEC Application Information Requirements 11
Table 2 Water Quality Results – Soda Mountain Subbasin 19
Table 3 Proposed Project Water Demands 21

Figures

Figure 1 Regional Location 4
Figure 2 Groundwater Basins 5
Figure 3 Existing Groundwater Wells 6

Acronyms

AF	acre-feet
AFY	acre-feet per year
BLM	U.S. Bureau of Land Management
CEC	California Energy Commission
CEQA	California Environmental Quality Act
County	San Bernardino County
DGMO	Desert Groundwater Management Ordinance
DWR	Department of Water Resources
GPD	gallons per day
gpm	gallons per minute
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
kV	kilovolt
PV	photovoltaic
RWQCB	Regional Water Quality Control Board
SGMA	Sustainable Groundwater Management Act
Silver LVGB	Silver Lake Valley Groundwater Basin
Soda LVGB	Soda Lake Valley Groundwater Basin
USEPA	U.S. Environmental Protection Agency
WCR	Well Completion Report

Report Authors

This *Water Supply Report for the Soda Mountain Subbasin of the Soda Lake Valley Groundwater Basin* was authored by Rincon Consultants, Inc. water resources planners Aubrey Mescher and Rosalyn Prickett, with support from project managers Evelyn Langsdale and Marlyng Gama.

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Executive Summary

The Soda Mountain Solar Project (project) proposes to construct, operate, and maintain a utility-scale solar photovoltaic electrical generating and battery energy storage facility and associated infrastructure to generate, store, and deliver renewable electricity to the statewide electricity transmission grid.

The project is located on approximately 2,670 acres of land administered by the U.S. Department of Interior, Bureau of Land Management, in San Bernardino County. Project construction would occur over an approximately 18-month period. After approximately 40 years of operation, the facility would be decommissioned over approximately 18 months. The project may use water sourced from up to five new on-site groundwater wells within the Soda Lake Valley Groundwater Basin in San Bernardino County, California. As an alternative, or in addition, to up to five new on-site groundwater wells, the project may use water from an existing water supply well in the Silver Lake Valley Groundwater Basin identified by Well Completion Report Number 2020-016662; this water supply source was previously analyzed in the *Silver Lake Valley Groundwater Basin Water Supply Report*, which was submitted to the California Energy Commission (CEC) as Appendix J, *Water Supply Report*, TN #261605 of Docket Number 24-OPT-03 (SMS 2025).

Implementation of MM BIO-3, as described in the project's CEC application materials, seeks to minimize construction impacts by reducing grading under the solar field, which in turn reduces the dust control water requirements (Resolution 2025a, Resolution 2025b, Rincon 2025). Because implementation of MM BIO-3 would reduce the area of temporary ground disturbance from 2,670 acres to 1,770 acres, it was assumed that the amount of water required for dust control would be reduced proportionally (i.e, water use at 66% of prior estimate). This report presents pre-mitigation groundwater demands, followed by water demands with implementation of MM BIO-3.

During the construction process, the project's groundwater demand is estimated to be a maximum of 319 acre-feet (AF) (223 AF with implementation of MM BIO-3) for a period of 18 months (with daily usage within the construction period varying depending on construction phase). Operational water demand for the 40-year lifespan of the project would be approximately 5.6 acre-feet per year (AFY) (224 AF total) and would begin following construction. During the decommissioning process, it is assumed that water demand would be the same as construction. Total groundwater demand for the project would be up to 862 AF (670 AF with implementation of MM BIO-3), including water used during construction, operations, and decommissioning. Potable demand for personnel use would total 94 AF across all project phases. Potable water is assumed to be supplied by the groundwater well(s) and treated as necessary for potable use via a Point-of-Use (located at sink or shower) treatment system.

The projected groundwater pumping for construction, operation and maintenance, and decommissioning water demands for the project falls within the safe yield of the Soda Mountain Subbasin, which is calculated as 357 AFY. Project water supply needs could be sustainably met through the up to five potential on-site production wells. Anticipated groundwater use for the project is a small fraction of the groundwater in storage within the Soda Mountain Subbasin.

This water supply report concludes that, based on an analysis of regional hydrogeology, an evaluation of pumping impacts, and water quality data, sufficient water resources are available to meet the projected water demands of the project.

1 Introduction

The Soda Mountain Solar Project (project or proposed project), developed by Soda Mountain Solar, LLC (applicant) is a utility-scale solar photovoltaic (PV) electric generating and battery energy storage facility in San Bernardino County; see Figure 1, *Regional Location,* below. The project would generate up to 300 megawatts (MW) of renewable energy and include up to 300 MW/1,200 MW-hours of battery storage. The power produced and stored by the project would be conveyed to the regional electrical grid through an interconnection with the existing Mead-Adelanto 500-kilovolt (kV) transmission line operated by the Los Angeles Department of Water and Power.

This report has been prepared to assess the Soda Mountain Subbasin (Subbasin) of the Soda Lake Valley Groundwater Basin (Soda LVGB) as a potential water supply source for the project. This report outlines the regulatory framework governing groundwater use in the project area, approximates water supply availability within the Subbasin, and assesses the project's potential impacts on groundwater resources including as related to groundwater levels, drawdown, and total amount of groundwater in storage.

This report, the *Soda LVGB Water Supply Report*, is informed by data from existing studies, reports, and publicly available sources including but not limited to the *Soda Mountain Solar Project Proposed Plan Amendment/Final Environmental Impact Statement/Environmental Impact Report* (PPA/FEIS/EIR; BLM 2015), which analyzed an earlier proposed version of the project, and a water supply report that assessed the Silver Lake Valley Groundwater Basin (Silver LVGB) as a potential water supply source for the project.

1.1 Previous Analysis

1.1.1 Soda LVGB

The *Soda Mountain Solar Project Proposed Plan Amendment/Final Environmental Impact Statement/Environmental Impact Report* (PPA/FEIS/EIR; BLM 2015) and its technical studies contains an extensive evaluation of groundwater supply and quality in the Soda Mountain Subbasin.

The *Soda Mountain Solar Project Water Supply Assessment* (Panorama 2013) evaluated the adequacy of groundwater supply from the Soda Mountain Subbasin for project use. Total construction, operation, and maintenance water demands were estimated at 786 AF over 33 years, and the study concluded that there is adequate groundwater supply in the Subbasin to meet projected demands.

The *Soda Mountain Solar Project Hydrogeological Conditions and Groundwater Modeling Report Addendum* (TRC Solutions 2013) updated groundwater modeling used to evaluate whether the hydrogeologic conditions at the project site could sustain groundwater use for construction, operation, and maintenance of the project without causing impacts to nearby water users or environmental resources located within the Mojave National Preserve. Adjustments were made to the model's recharge rates and hydraulic conductivity values, and water demands were updated to be consistent with the *Soda Mountain Solar Project Water Supply Assessment* (Panorama 2013). The groundwater modeling shows that that there is adequate groundwater in the Subbasin to support construction, operation, and maintenance of the project without adversely affecting nearby wells or sensitive resources. The report did recommend completing a well test to confirm the modeling.

The *Soda Mountain Solar Project Groundwater Modeling Sensitivity Analysis* (Burns & McDonnell and Panorama 2014) was prepared to address National Park Service (NPS) and U.S. Geological Survey (USGS) comments on the groundwater flow model. The sensitivity analysis results demonstrate that the proposed groundwater well test results will not change the analysis of impacts at a nearby spring.

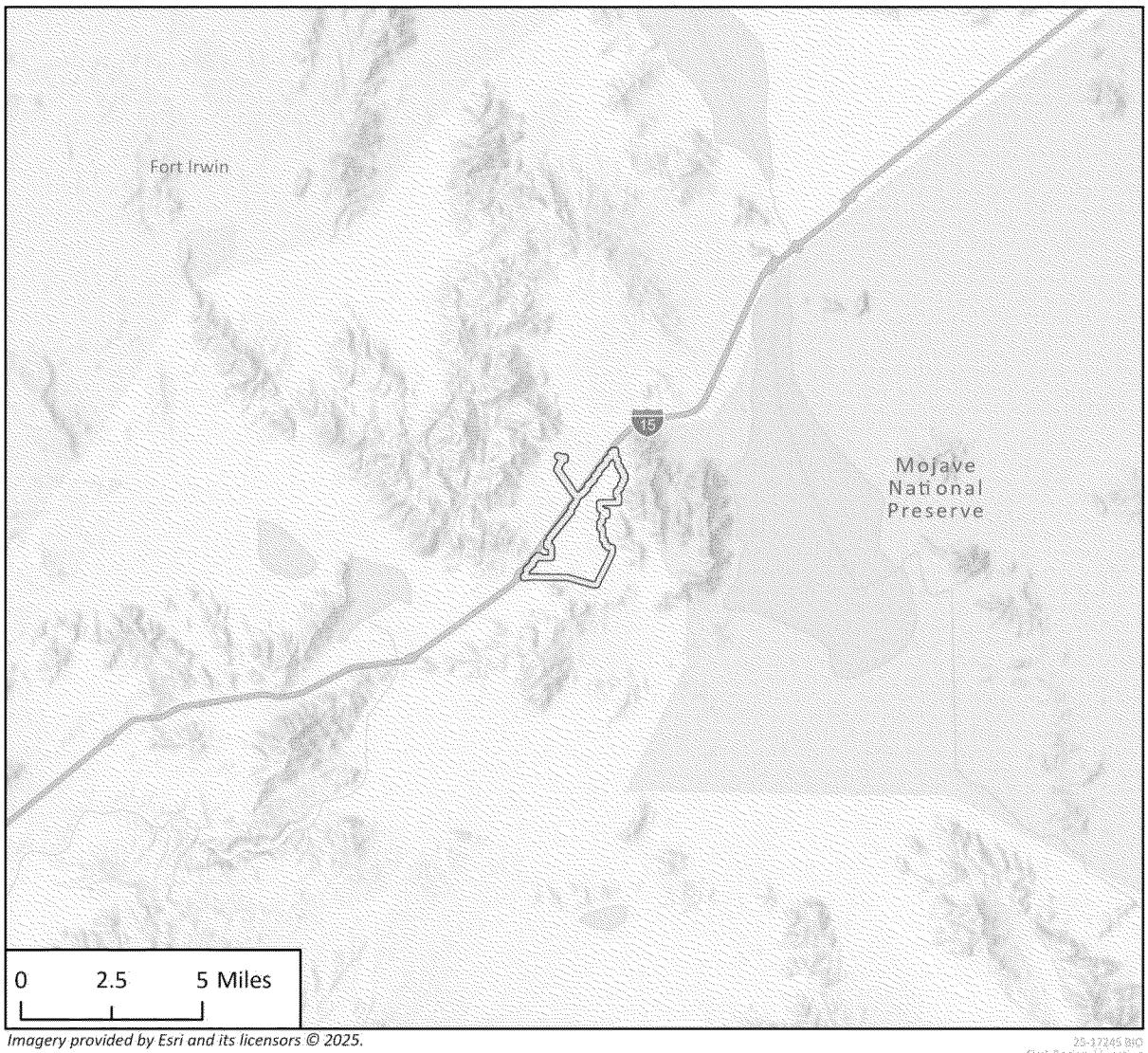
1.1.2 Silver LVGB

The *Silver LVGB Water Supply Report* (SMS 2025) assessed an existing water supply well in the Silver LVGB identified by Well Completion Report (WCR) Number 2020-016662. An aquifer test and water quality monitoring were conducted at the supply well (WRC No. 2020-016662) to inform the *Silver LVGB Water Supply Report*. The Silver LVGB supply well is located approximately 12 miles northeast of the proposed project site and approximately three miles north of the town of Baker, a census-designated place in San Bernardino County that overlies the Soda LVGB. Aerial imagery shows that the areas around the Silver LVGB supply well and the greater Silver LVGB are almost entirely undeveloped desert land, with no developed agricultural fields, and no other groundwater wells within a 0.5-mile radius of the well (see Figure 2, *Groundwater Basins,* and Figure 3, *Existing Groundwater Wells*, below). This suggests a lack of substantial ongoing groundwater production for land uses in the project area.

The *Silver LVGB Water Supply Report* assessed availability of water supply in the Silver LVGB based on consideration of drawdown, average depth to groundwater, total volume of water in the aquifer, and percentage used of total available storage, and concluded that the Silver LVGB may be used to meet all water demands of the proposed project without resulting in adverse impacts or regulatory conflicts. Potential drawdown would be negligible and temporary; the basin would recover from the initial drawdown of pumping activities during constant-state pumping, as well as following the cessation of project-related pumping. No water quality treatment would be necessary.

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Figure 1 Regional Location



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Fig 1 Regional Location

Study Area

N

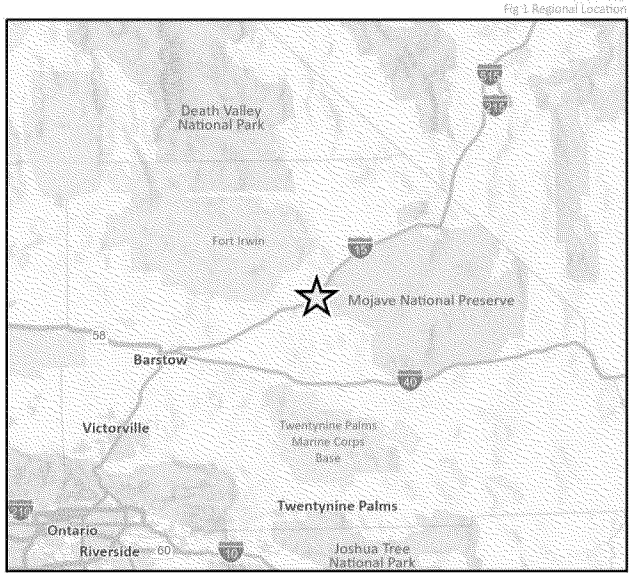


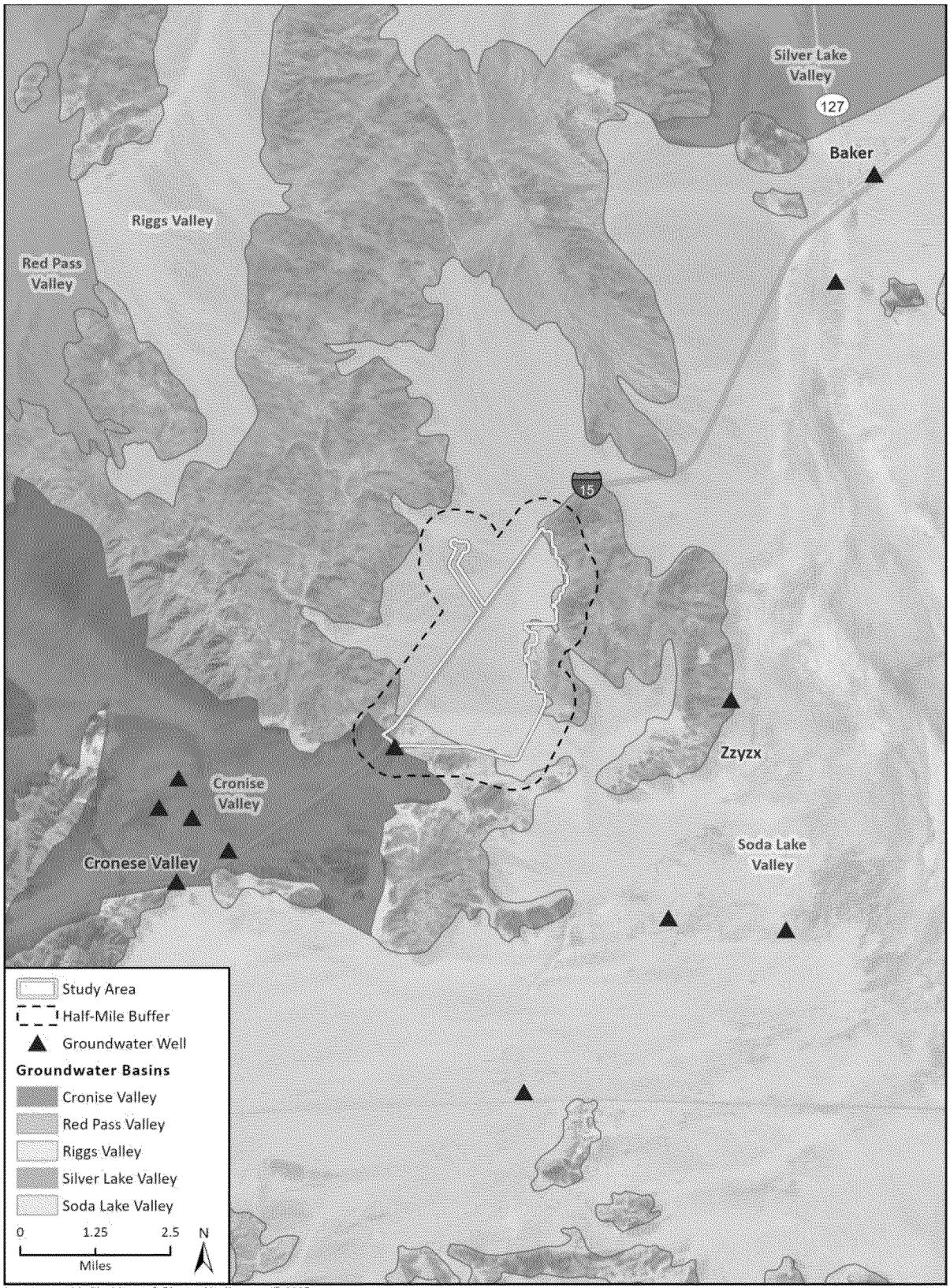
Figure 2 Groundwater Basins



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Figure 3 Existing Groundwater Wells



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Additional data provided by CA DWR, 2025 and Bureau of Land Management, 2015.

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Fig X Existing Wells

2 Project Location and Description

2.1 Location and Setting

The project would be located on an approximately 2,670-acre site in the alluvial valley dividing the northern and southern portions of the Soda Mountains in the Mojave Desert. See Figure 1, *Regional Location.* The site is approximately seven miles southwest of the community of Baker in unincorporated San Bernardino County. The site is approximately 50 miles northeast of Barstow, and 0.5 mile from the western boundary of the Mojave National Preserve. The site is bounded to the east by the Mojave National Preserve and U.S. Bureau of Land Management (BLM) lands, including the Rasor Off-Highway Vehicle recreation area to the southeast. Interstate 15 (I-15) traverses the east side of the project site. The proposed Brightline West High-Speed Passenger Train Project (formerly the DesertXpress and XpressWest Project) also has been permitted for construction within the I-15 corridor.

Aerial imagery reveals that the vicinity of the project site and the Soda LVGB is almost entirely undeveloped desert habitat, with no developed agricultural fields on or near the project site. There are also no existing groundwater wells within the project site or a 0.5-mile radius of the site; see Figure 3, *Existing Groundwater Wells*. As noted above, the project site is located approximately seven miles southwest of Baker, which also overlies the Soda LVGB. U.S. Census Bureau data show that the population of Baker decreased from a total of 504 individuals in 2000 to 442 in 2020 (USCB 2025); as such, the population decreased by approximately 12.3 percent over 20 years. According to the San Bernardino County well inventory, there are 54 wells within Baker (SMS 2025); based on the decreasing population size, it is assumed that the current wells were not installed recently and are not present to accommodate increased municipal uses.

2.2 Project Description

The project proposes to construct, operate and maintain, and decommission an up to 300-MW solar PV and battery energy storage facility located within an approximately 2,670-acre site. Construction would include approximately 1,770 acres of temporary disturbance (rounded up from 1,769.88 acres) and 289 acres of permanent disturbance. The project would include the following components:

1. The solar plant site (i.e., all facilities that create a footprint in and around the field of solar panels, including the solar field consisting of solar power arrays identified as the East Array and South Arrays 1, 2, and 3), operation and maintenance (O&M) buildings and structures, stormwater infrastructure, and related infrastructure and improvements.
2. A substation and switchyard for interconnection to the existing transmission system.
3. Gen-tie line connecting project substation, switchyard, and 500-kV Mead-Adelanto line.
4. Approximately 300 MW/1,200 MW-hour of battery energy storage system across 18 acres.

The project would operate 24 hours per day year-round and would generate, store, and deliver solar-generated power to the regional electrical grid through an interconnection with the existing Mead-Adelanto 500-kV transmission line.

SMSP01366

The project may include up to five new on-site groundwater supply wells to produce water supply for the project from the Soda Mountain Subbasin of the Soda LVGB. This analysis assumes that during all project phases, potable water would be supplied by the groundwater well(s) and treated as necessary for potable use via a Point-of-Use treatment system. As an alternative, or in addition, to up to five on-site wells, water may be obtained from the existing Silver LVGB supply well (WCR No. 2020-016662) and transported by water truck to the project site; this Silver LVGB supply well is analyzed in the *Silver LVGB Water Supply Report*. It is anticipated that water would be stored in tanks on-site for use as needed throughout operations, including for non-potable uses, emergency fire suppression, and solar panel washing. Water would be distributed throughout the site as needed using water trucks. Water demands are presented in Section 5, *Project Water Demands*.

3 Groundwater Management Considerations and California Energy Commission Guidelines

This section presents groundwater management regulations and California Energy Commission (CEC) guidelines relevant to the potential use of groundwater to produce water supply for the proposed project from the underlying Soda LVGB.

3.1 Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act of 2014 (SGMA) created a framework for the sustainable management of groundwater resources by local agencies. In accordance with SGMA, basins designated by the California Department of Water Resources (DWR) as High Priority or Medium Priority (California Water Code Section 10933) are required to be managed by a DWR-approved Groundwater Sustainability Agency (GSA) through implementation of a Groundwater Sustainability Plan (GSP), also subject to review and approval by the DWR. GSPs outline strategies to achieve sustainable groundwater conditions within 20 years, such as replenishment and demand management, guided by set goals and criteria.

Basin prioritization is based on the best available socioeconomic and hydrogeological data, such as population, number of wells, and irrigated acres. The majority of subbasins within the Mojave Desert are designated as Low Priority or Very Low Priority due to factors such as the extent of urban development, existing groundwater wells, and reliance on groundwater for supply (SMS 2025). The availability of groundwater data in this area is also generally limited, and basin priority designations may not provide a comprehensive depiction of hydrologic conditions or groundwater resources.

The Soda LVGB, which underlies the proposed project site and is assessed herein as a potential water supply source for the project, is designated by DWR as Very Low Priority; therefore, the Soda LVGB is not managed by a GSA and is not subject to a GSP. The Silver LVGB, which was assessed in the *Silver LVGB Water Supply Report* (SMS 2025) for the proposed project, is designated by DWR as Low Priority and therefore is also not managed by a GSA or subject to a GSP. Thus, there is no GSP with groundwater data characterizing existing conditions in the project area for the Soda LVGB or the Silver LVGB. Therefore, the analysis presented herein is informed by site-specific data collected for the *Soda Mountain Solar Project PPA/FEIS/EIR* (BLM 2015), and other published resources including but not limited to DWR's Bulletin 118 reports, San Bernardino County publications, and regional studies in the Mojave Desert with relevant groundwater information.

3.2 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) (Division 7 of the California Water Code) provides the basis for water quality regulation within California and defines water quality objectives as the limits or levels of water constituents that are established for reasonable protection of beneficial uses. The California State Water Resources Control Board administers water rights, water pollution control, and water quality functions throughout the state, while each of the nine Regional Water Quality Control Boards (RWQCBs) conduct planning, permitting, and

SMSP01368

enforcement activities. The proposed project is located within the jurisdiction of the Lahontan RWQCB (Region 6) and is subject to the management direction of the *Water Quality Control Plan for the Lahontan Region* (Basin Plan).

The Basin Plan outlines water quality objectives for beneficial uses, and forms the regulatory references for meeting state and federal requirements for water quality control. Changes in water quality are allowed if the change is consistent with the maximum beneficial use of the state and does not unreasonably affect the present or anticipated beneficial uses. Beneficial water uses include consumptive uses, or those normally associated with human activities (primarily municipal, industrial, and irrigation uses), and non-consumptive uses, or those that do not significantly deplete water supply (such as swimming, boating, waterskiing, fishing, and hydropower generation).

The proposed project site is located in the Soda Lake Hydrologic Subarea. Beneficial uses in this area include: municipal and domestic supply (MUN); agricultural supply (AGR); groundwater recharge (GWR); water contact recreation (REC-1); non-contact water recreation (REC-2); cold freshwater habitat (COLD); wildlife habitat (WILD); and water quality enhancement (WQE) (Lahontan RWQCB 2017). Water quality standards and objectives in the vicinity of the project site are designed to support the beneficial uses for respective waters.

3.3 Desert Groundwater Management Ordinance

The County adopted the Desert Groundwater Management Ordinance (DGMO) in 2002 with Ordinance No. 3872, to help protect non-adjudicated portions of the Mojave Desert while not precluding the use of groundwater in these areas. The DGMO applies to certain new groundwater wells, and requires a permit to locate, construct, operate, or maintain new wells within the unincorporated, non-adjudicated desert region of San Bernardino County. This permit is discretionary under the California Environmental Quality Act (CEQA) (Public Resources Code 21000 et seq.); therefore, CEQA compliance must be complete prior to permit issuance. Permit conditions may include requirements for groundwater management, monitoring, and mitigation for potentially adverse effects associated with the construction, operation, or maintenance of the new well.

The DGMO applies to new wells proposed within San Bernardino County but outside the jurisdictional boundaries of the Mojave Water Agency and Public Water Districts of the Morongo Basin, as well as new wells proposed in unincorporated desert areas of San Bernardino County (generally including areas west of the Colorado River, north of the San Bernardino-Riverside County line, south of the San Bernardino-Inyo County line, and east of Fort Irwin Military Reservation, the Mojave Water Agency, the Marine Air Ground Task Force Command Center, Twentynine Palms Water District, and the City of Twentynine Palms) (San Bernardino County 2022). The DGMO does not apply to groundwater wells located on federal lands within San Bernardino County, "unless otherwise specified by interagency agreement." The BLM and San Bernardino County have a memorandum of understanding (MOU) under which the BLM requires conformance with the DGMO for all projects proposing to use groundwater from beneath public lands in San Bernardino County.

New groundwater wells proposed in the Soda LVGB and the Silver LVGB are subject to the DGMO due the location of these basins being within the unadjudicated desert region of San Bernardino County and the Mojave Desert. Use of the existing Silver LVGB supply well assessed in the *Silver LVGB Water Supply Report* (SMS 2025) would not be subject to the DGMO because the DGMO applies to new wells. However, there is no existing groundwater well on the proposed project site; if a new groundwater well is installed in the Soda LVGB (or the Silver LVGB), it would be subject to the DGMO, and CEQA review of potential impacts associated with the construction, operation, and

maintenance of the proposed well(s) would need to be complete prior to issuance of a DGMO permit (by San Bernardino County).

3.4 California Desert Conservation Area Plan

The California Desert Conservation Area (CDCA) Plan describes multiple-use classes applicable to water resources on the project site. Specifically, the CDCA Plan (BLM 1999) requires that areas designated Multiple-Use Class L be managed to provide for the protection and enhancement of surface and groundwater resources, except for instances of short-term degradation caused by water development projects. For areas designated Class M or I, the CDCA Plan requires management to minimize the degradation of water resources. For all areas, best management practices (BMPs) developed by the BLM shall be used to avoid degradation and to comply with Executive Order 12088, which requires all federal agencies be in compliance with environmental laws and fully cooperate with the Environmental Protection Agency (EPA) and with state, interstate, and local agencies to prevent, control, and abate environmental pollution (SMS 2025b). BLM has approved a CDCA Plan Amendment to identify the project site as suitable for solar energy development (BLM 2016).

3.5 California Energy Commission Requirements

The CEC is the CEQA lead agency for the proposed project. The CEC's Information Requirements for an Application for Certification or Small Power Plant Exemption (California Code of Regulations, title 20, division 2, chapter 5, appendix B; "CEC Application Information Requirements") requires analysis of specific issues related to groundwater resources. The CEC Application Information Requirements were addressed in the *Silver LVGB Water Supply Report* (SMS 2025) for the proposed project's potential use of water from an existing water supply well in the Silver LVGB identified by WCR Number 2020-016662. This *Soda LVGB Water Supply Report* presents new or revised information where necessary to address CEC Application Information Requirements for the potential on-site groundwater wells in the Soda LVGB assessed herein.

Table 1, below, provides an overview of CEC Application Information requirements and how they are addressed herein.

Table 1 CEC Application Information Requirements

CEC Appendix B Requirements	Proposed Project
A detailed description of the hydrologic setting of the project, including groundwater bodies, surface water bodies, surface inundations zones, and any groundwater wells within 0.5 mile of the proposed project and its water supply well.	See Section 4, *Groundwater Basin and Climate* for discussion of the Soda Mountain Subbasin of the Soda Lake Valley Groundwater Basin (Soda LVGB) and hydrologic setting. Figure 3 shows that no groundwater wells are located within 0.5 mile of the proposed project site.
A detailed description of the water to be used and discharged by the project, including:	

SMSP01370

CEC Appendix B Requirements	Proposed Project
▪ The source(s) of the primary and back-up water supplies and the rationale for their selection;	The water supply source assessed herein is the Soda LVGB; this source was selected for the proposed project due to location of the groundwater basin underlying the project site, and ability of the basin to support the proposed project as assessed herein. An alternative or additional water supply source is the Silver Lake Valley Groundwater Basin (Silver LVGB), which is assessed in the *Silver LVGB Water Supply Report* (SMS 2025).
▪ The expected physical and chemical characteristics of the source and discharge water(s) including identification of both organic and inorganic constituents before and after any project-related treatment;	Physical and chemical characteristics of the Soda Mountain Subbasin of the Soda LVGB are presented in Section 4, *Groundwater Basin and Climate*. The project does not include any discharge waters.
▪ An average and maximum daily and annual water demand and wastewater discharge for the construction, operation, and decommissioning phases of the project;	Average and maximum water demands are presented in Section 5, *Project Water Demand*. The project does not include any wastewater discharge.
▪ A detailed description of all facilities to be used in water conveyance (from primary source to the power plant site), water treatment, and wastewater discharge;	Water facilities may include up to five new supply wells installed on the project site in the Soda LVGB. Storage tanks would be used to store water on-site for use as needed. Water would be distributed throughout the site as needed using water trucks. See Section 2.2, *Project Description*. No water quality treatment is needed. No wastewater discharge would occur.
▪ For all water supplies intended for industrial uses to be provided from public or private water purveyors, a letter of intent or will-serve letter indicating that the purveyor is willing to serve the project, has adequate supplies available for the life of the project, and any conditions or restrictions under which water will be provided;	Any water supply wells located on the project site in the Soda LVGB would be owned by the project applicant.
▪ Water mass balance and heat balance diagrams for both average and maximum flows that include all process and/or ancillary water supplies and wastewater streams. Highlight any water conservation measures on the diagram and the amount that they reduce water demand.	The project would use groundwater without any significant thermal energy transformation. See Section 2.2, *Project Description*, under "Water Mass and Heat Balance."
▪ For all water supplied which necessitates transfers and/or exchanges at any point, to identify all parties and contracts/agreements involved, including the primary source for the transfer and/or exchange water (e.g., surface water, groundwater), the status of all appropriate agencies' approvals for the proposed use, environmental impact analysis on the specific transfers and/or exchanges required to obtain the proposed supplies, a copy of any agency regulations that govern the use of the water, and an explanation of how the project complies with the agency regulation(s)	The project does not include any water supply that necessitates transfers and/or exchanges at any point.

CEC Appendix B Requirements	Proposed Project
An impact analysis of the proposed project on water resources and a discussion of conformance with water-related laws, ordinances, regulations, and standards and policy. This discussion shall include:	Analysis of potential impacts to water supply is provided in Section 6.1, *Water Availability*. Laws and regulations are assessed in Section 3, and conclusions are presented in Section 7, *Conclusions*.
▪ The effects of project demand on the water supply and other users of this source, including, but not limited to, water availability for other uses during construction or after the power plant begins operation, consistency of the water use with applicable RWQCB basin plans or other applicable resource management plans, and any changes in the physical or chemical conditions of existing water supplies as a result of water use by the power plant;	Section 3.2, *Porter-Cologne Water Quality Control Act*, states that the project is within the Lahontan RWQCB and subject to the Lahontan Basin Plan. Section 4.3, *Soda Mountain Subbasin*, presents information regarding inflow and outflow for the Soda Mountain Subbasin. Section 7, *Conclusions*, describes that the project would not result in impacts to groundwater supply; other users would not be affected.
▪ If the project will pump groundwater, an estimation of aquifer drawdown based on a computer modeling study shall be conducted by a professional geologist and include the estimated drawdown on neighboring wells within 0.5 mile of the proposed well(s), any effects on the migration of groundwater contaminants, and the likelihood of any changes in existing physical or chemical conditions of groundwater resources shall be provided.	Groundwater drawdown is discussed in Section 6.1, *Water Availability*. Figure 3, *Existing Groundwater Wells,* shows that no wells are located within 0.5 mile of the project site, where the new supply well would be located. Section 7 presents conclusions. The project would not result in changes to existing physical or chemical conditions in the Soda Mountain Subbasin of the Soda LVGB.

SMSP01372

4 Groundwater Basin and Climate

From its headwaters in the San Bernardino Mountains, the Mojave River travels north and east to generally end its surface flow at Soda Lake south of the town of Baker. Most of the Mojave River is characterized by a dry riverbed that only on occasion reveals surface flow forced upward by less permeable underlying rock formations. Soda Lake and Silver Lake are desert basins with no outlet that periodically fill with water after a storm event to form temporary lakes. The project site is located in the Soda Lake watershed, which is composed of both gently sloping valleys surrounded by steeper mountainous areas (BLM 2015). Water draining from the surrounding mountains during rain events is conveyed through the project area through a series of unnamed braided desert washes.

4.1 Climate

Annual average precipitation within the surface area of the 595-square-mile Soda LVGB ranges between approximately three and five inches (DWR 2004a). The project vicinity has a warm, dry desert climate, with extremely hot, dry summers and temperate winters. Climatic records for Barstow Daggett AP Fire Station (Cooperative Observer Program Station No. 042257) indicate that the project site has an average annual maximum temperature of 81.6 degrees Fahrenheit (°F) and an average annual minimum temperature of 53.4°F (SMS 2025). Average annual rainfall is 3.83 inches, most of which occurs between December and February, whereas the average annual total snowfall, which largely occurs during December and January, is 0.8 inch (WRCC 2025).

4.2 Soda Lake Valley Groundwater Basin

The project site overlies the Soda Mountain Subbasin of the Soda LVGB. The Soda LVGB extends for approximately 594 square miles (381,000 acres) in San Bernardino County, with a surface elevation ranging from approximately 923 feet above mean sea level (amsl) in the lower portions of the basin floor to approximately 5,000 feet amsl in the upper portions of the eastern-mountain basin boundary. The Soda LVGB is bounded by low permeability nonwatery-bearing rocks of the Marl and Kelso Mountains to the east, the Bristol and Cady Mountains to the south, and the Soda and Cave mountains along the western boundary of the basin (DWR 2004a). Quaternary alluvium is the primary water bearing material, existing primarily at or around the basin valley. Quaternary alluvium in the basin consists of unconsolidated younger alluvium underlain by older, poorly consolidated alluvial material (DWR 2004a).

Recharge to the Soda LVGB occurs primarily from discharge to the local alluvial aquifer from the Mojave River, percolation through alluvial fan deposits along the basin margins, and to a lesser extent, subsurface inflows from Cave Canyon, Kelso, and the Broadway Valley groundwater basins (DWR 2004a). Key surface features within this groundwater basin include Soda Lake, a dry lakebed or “playa lake” located east of the project site, approximately in the west-central portion of the groundwater basin, which contains water only in direct response to large storm events resulting in substantial flows in the Mojave River. Soda Lake is a remnant of the ancient Mojave Dry Lake, and experiences temporary flooding roughly once every 10 years (USGS 2009). Groundwater typically follows the natural topography of the area and flows toward Soda Lake where it eventually discharges north into the Silver LVGB (DWR 2004a).

As discussed above in Section 3.1, *Sustainable Groundwater Management Act*, Soda LVGB has been designated by the DWR as Very Low Priority based upon total groundwater use within the basin being less than 2,000 AFY and "no documented impacts" based upon the 2019 Basin Prioritization Project, subcomponent 8(c) (DWR 2025). Basins identified as Very Low Priority are not required to be managed by a GSA(s) through implementation of a GSP(s). Therefore, the extent of available data for groundwater in the project area is generally limited. For the purposes of this Water Supply Report, analysis is presented on the basis of available published data and technical studies contained within the *Soda Mountain Solar Project PPA/FEIS/EIR* (BLM 2015).

4.3 Soda Mountain Subbasin

The Soda Mountain Subbasin is located in the northwestern portion of the Soda LVGB. The Soda Mountain Subbasin area is outlined in blue in Figure 4; note that the project area (shown in red) on this figure reflects a prior proposed footprint (including a solar array northwest of I-15 that is no longer part of the project). The 51 square mile (32,946 acre) Subbasin is topographically higher than most of the Soda LVGB and is generally separated from the rest of Soda LVGB by mountains to the south and east (BLM 2015). Geologic mapping indicates that the alluvium in the subbasin is surrounded by volcanic and granitic geologic units with the presence of some fault bounded carbonate units. The direction of groundwater flow within the Subbasin is expected to generally mimic the slope of the surface topography. Alluvial groundwater likely flows from the Subbasin to the remainder of Soda LVGB through a bedrock gap in the Soda Mountains to the east toward Soda Lake and a bedrock gap to the southeast toward Mojave Wash (Panorama 2013).

Geologic and geophysical logs were developed and evaluated as part of a groundwater well test completed for the project in accordance with Applicant Proposed Measure (APM) 14 and APM 15 in the *Soda Mountain Solar Project PPA/FEIS/EIR* (BLM 2015). The alluvium within the Subbasin covers an area of approximately 19 square miles (12,632 acres) across the lower elevations of the valley. The upper 200 feet of sediment was observed to dominantly consist of alluvium composed of fine- to coarse-grained sands and gravels. A clay layer was encountered, followed by fine- to medium-grained clayey sands, which transition to fine- to coarse-grained, well-graded sands. Weathered bedrock was logged below the sand aquifer with the character of medium to coarse granitic sands, variably consolidated depending on the degree of weathering. The remaining 32 square miles (20,314 acres) within the Subbasin consist of the mountains surrounding the valley (BLM 2015).

4.3.1 Inflow/Outflow

Recharge for the Subbasin primarily occurs as runoff from the surrounding mountains onto alluvial fan deposits of the surrounding valleys. Mountain-front recharge was estimated using precipitation data from the PRISM Climate Group. The mountainous portion of the Subbasin receives approximately 4.855 inches (0.405 foot) of rain annually (based on a weighted average over the elevation ranges represented), which equates to 8,219 AFY of precipitation. Using a recharge rate of 7.8 percent, mountain-front recharge was estimated at 641 AFY (Panorama 2013). BLM staff suggested recharge rates ranging from 3 percent to 10 percent of precipitation (0.12 to 0.4 inches recharge per year) should be used in the revised groundwater model based on their experience elsewhere in arid and semi-arid regions of southern California (Panorama 2013). The low-end (3 percent) and high-end (10 percent) recharge rates used in the groundwater model provide a total input of 376 to 1,330 AFY of recharge (corresponding to 0.12 to 0.4 inches of recharge per year) (Panorama 2013).

SMSP01374

The Subbasin is geographically and topographically isolated and does not receive much, if any, inflow from adjacent groundwater basins. Consequently, other sources of inflow to the basin were not included in estimates of groundwater availability or recharge (Panorama 2013).

Groundwater outflow from the eastern outlet of the Soda Mountain Valley is estimated in the groundwater model for existing (steady-state) conditions to be 121 AFY with low-end recharge and 425 AFY with high-end recharge (TRC Solutions 2013).

4.3.2 Groundwater Levels

Groundwater levels within the Subbasin are higher than those measured by the U.S. Geological Survey (USGS) in other portions of Soda LVGB (BLM 2015). As part of the groundwater well test completed under APM 14 and APM 15, a test well (PW-1) and observation well (OW-1) were constructed approximately 187 feet apart on the south side of Blue Bell Mine Road. The well test results determined that groundwater elevation (measured static depth to water) in the project area is approximately 1,009 amsl (or 428 to 435 feet below ground surface (bgs) as measured in wells PW-1 and OW-1 respectively). Groundwater levels outside the Subbasin measured by the USGS at wells located near the eastern end of Rasor Road lower in Soda LVGB range from 945 feet to 958 feet amsl. The groundwater levels at PW-1 and OW-1 are approximately 80 to 90 feet above the elevation of groundwater along the west shore of Soda Lake (BLM 2015).

4.3.3 Subbasin Storage

Based on the groundwater well test, the thickness of the saturated alluvium was estimated at approximately 125 feet based on the observed geology (including a portion of the underlying weathered bedrock) and Subbasin storage was estimated to be approximately 375,000 AF (BLM 2015).

4.3.4 Safe Yield

~~The only~~There are no existing producer~~s~~ in the Subbasin ~~is the groundwater well installed at the Rasor Road Service Station near the southwest corner of the project site (shown on Figure 3 above). There are~~and no planned future uses of groundwater within the Subbasin other than the Project (BLM 2015). Pumping conducted at the test well identified as PW-1, installed on the south side of Blue Bell Mine Road as mentioned above in Section 4.3.2, indicated that pumping could be sustained at a yield of approximately 26 to 27 gpm (BLM 2015).

In addition, t~~T~~he well at the Rasor Road Service Station is a 760-foot-deep water supply well screened in bedrock that is hydrologically separated from the saturated alluvium in the valley (Panorama 2013). Reports of yields from this well range from just 1,500 gallons per day (gpd) (1.7 AFY) to 10 to 12 gpm (16 to 19 AFY) (BLM 2015). Groundwater use at the Rasor Road Service Station is expected to remain constant due to the limited well productivity.

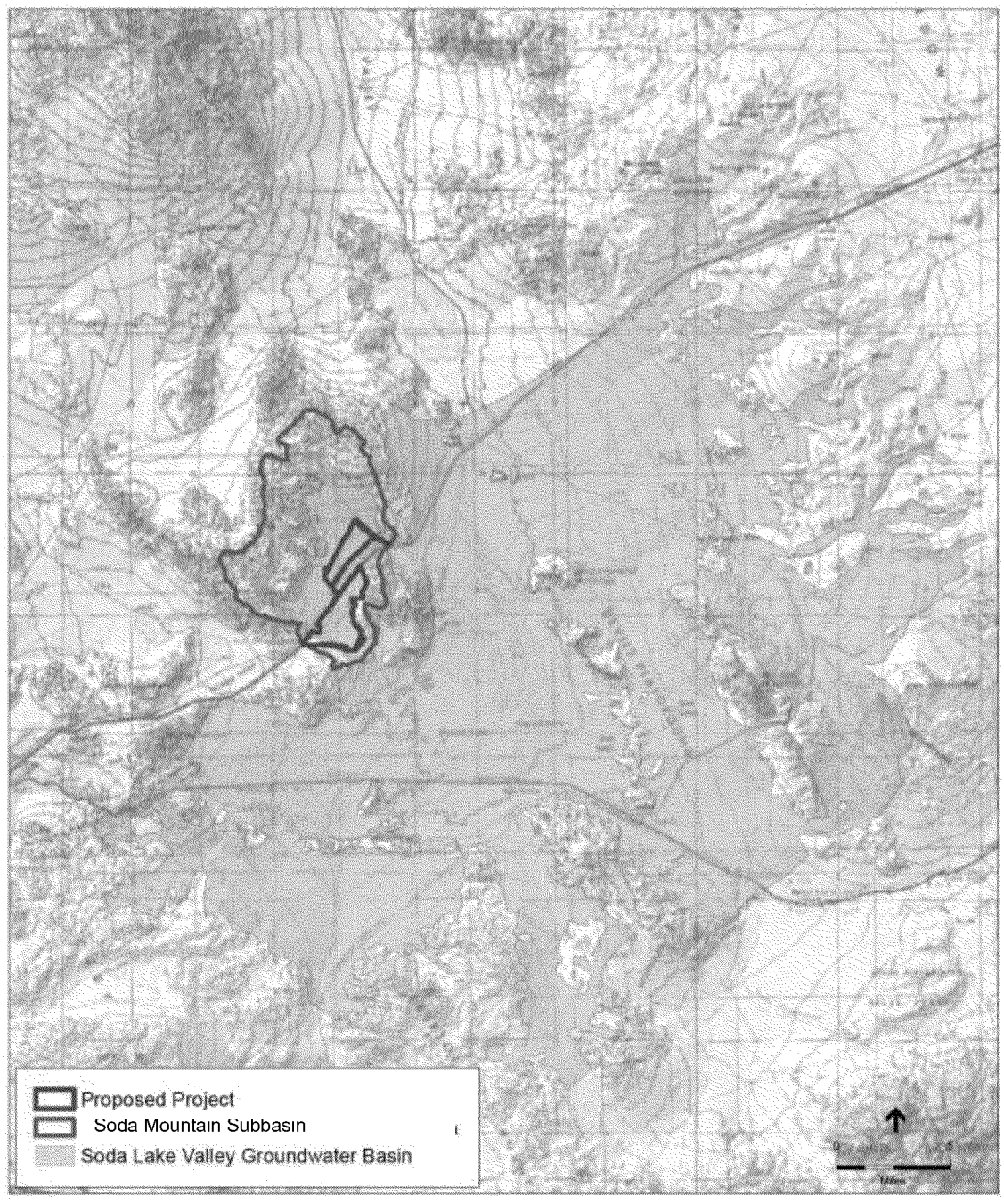
Using the high end of potential Rasor Road Service Station use and the low end of the estimated recharge rate to be conservative, the safe yield of the Soda Mountain Subbasin is calculated as follows (adapted from Panorama 2013):

Recharge – Rasor Road Service Station Pumping = Safe Yield

376 AFY – 19 AFY = 357 AFY

SMSP01376

Figure 4 Soda Mountain Subbasin, Soda Lake Valley Groundwater Basin[1]



[1] The Soda Mountain Subbasin area is outlined in blue in Figure 4; note that the project area (shown in red) on this figure reflects a prior proposed footprint (including a solar array northwest of I-15 that is no longer part of the project).

4.4 Groundwater Quality

Groundwater quality in the Soda LVGB is typically characterized by elevated levels of sodium chloride or sodium bicarbonate (salts), particularly near Soda Lake, with elevated sulfate levels in the eastern portion of the basin. DWR has rated groundwater quality in this basin as "marginal to inferior for both domestic and irrigation purposes," based on elevated concentrations of fluoride, boron, and TDS (DWR 2004a).

Limited groundwater quality data is available for the Soda Mountain Subbasin due to the absence of wells in the valley. There are no known hazardous materials sites in the Subbasin. Water quality at the Rasor Road Service Station well, which is screened in bedrock and hydrogeologically separated from the saturated alluvium of the valley, has TDS concentrations of approximately 3,000 mg/L and requires use of a reverse osmosis system to produce potable water (BLM 2015). In September 2010, a geophysical survey collected subsurface resistivity data that were used to estimate water quality. Based on the study, TDS values for groundwater at the project site were anticipated to be in the range of 800 to 1,200 parts per million (BLM 2015).

4.4.1 Current Water Quality

Groundwater quality samples were collected and evaluated as part of a groundwater well test completed for the project in accordance with APM 16 in the *Soda Mountain Solar Project PPA/FEIS/EIR* (BLM 2015). Given the lack of development in the project area (the Rasor Road Service Station is the only developed parcel in the vicinity), this analysis assumes that groundwater quality remains stable due to the lack of contaminant sources and low human activity which means natural filtration processes stay intact. Groundwater samples were collected for water quality analysis from both the production (PW-1) and observation (OW-1) wells. Samples were collected during well development, at the end of an aquifer step-drawdown test, and approximately every 24 hours during pumping conducted as part of a constant-rate well test (BLM 2015). Select analytical results for general chemistry are presented in Table 2, along with their federal Maximum Contaminant Levels (MCLs) and Secondary Maximum Contaminant Levels (SMCLs).

SMSP01378

Table 2 Water Quality Results – Soda Mountain Subbasin

Detected Analyte	OW-1 9/17/14	PW-1 10/5/14	PW-1 10/7/14	PW-1 10/8/14	PW-1 10/9/14	Unit	Title 22 MCL[1] or SMCL[2]	MCL / SMCL Exceeded?
Field Measurements								
pH	8.14	8.61	8.38	8.37	8.36	mg/L	6.5 to 8.5	Yes
Temperature	33.08	33.11	31.73	32.63	32.88	mg/L	N/A	N/A
Laboratory Analysis								
TDS	1140	1260	1250	1250	1250	mg/L	500	Yes
Total Nitrate/Nitrite (as N)	2.6	2.0	2.2	1.9	2.0	mg/L	10,000	No
Carbonate/Bicarbonate	83.6	60.4	50.7	59.3	55.4	mg/L	N/A	N/A
Sulfate	369	446	446	429	429	mg/L	250	Yes
Chloride	292	241	243	236	239	mg/L	250	Yes
Calcium	34.7	46.5	40.3	39.7	39.8	mg/L	N/A	N/A
Magnesium	6.69	6.22	<5	<5	<5	mg/L	N/A	N/A
Sodium	346	347	359	358	346	mg/L	N/A	N/A

MCL = Maximum Contaminant Level; SMCL = Secondary Maximum Contaminant Level; mg/L = milligrams per liter

1 Maximum Contaminant Level (MCLs) from Code of Federal Regulations, Title 40, Chapter I, Part 141, National Primary Drinking Water Regulations.

2 Secondary Maximum Contaminant Level (SMCLs) from Code of Federal Regulations, Title 40, Chapter I, Part 143, National Secondary Drinking Water Regulations.

SOURCE: BLM 2015

The water quality results presented above show that pH, TDS, sulfate, and chloride concentrations in Subbasin groundwater exceeded primary or secondary MCLs established by the California EPA or the USEPA. Title 22 water quality standards are designed to protect drinking water quality, which means that use of underlying groundwater without treatment would be limited to non-potable uses associated with project construction, operation and maintenance, and decommissioning. Water quality at the proposed project site is sufficient to meet the non-potable water needs of the project. Potable water is assumed to be supplied by the groundwater well(s) and treated as necessary for potable use via a Point-of-Use treatment system. The 1996 Amendments to the Safe Drinking Water Act (Section 1412(b)(4)(E)(ii)) allows systems to install Point-of-Use treatment devices to achieve compliance with some of the federal MCLs established in the National Primary Drinking Water Regulations.

5 Project Water Demand

Table , below, presents an overview of water demands associated with each project phase, including construction, operation and maintenance, and decommissioning. The construction and decommissioning phases are assumed to span 18 months each, with a total project lifespan of 40 years. Groundwater would be needed in all three phases of the project, along with limited potable supply for personnel use.

Implementation of MM BIO-3, as described in the project's CEC application materials, seeks to minimize construction impacts by reducing grading under the solar field, which in turn reduces the dust control water requirements. Implementation of MM BIO-3 is estimated to result in 289 acres of total permanent impacts and 1,770 acres of total temporary impacts. This report presents pre-mitigation groundwater demands, followed by water demands with implementation of MM BIO-3.

During the construction phase, the project's groundwater demand is estimated to be a maximum of 319 AF for a period of 18 months (with daily usage within the construction period varying depending on construction phase). Operational water demand for the 40-year lifespan of the project would be approximately 5.6 AFY (224 AF total) and would begin following construction. During the decommissioning process, it is assumed that water demand would be the same as construction. Total groundwater demand for the project would be up to 862 AF across all project phases.

Potable demand for personnel use would be greater during the construction and decommissioning phases when more employees are onsite (a maximum of 16.8 AF over 18 months). Long-term potable demands are estimated at 1.5 AFY (1,339 gallons per day for 365 days) or 60 AF over 40 years. Total potable water demand for the project would be up to 94 AF across all project phases. Potable water is assumed to be supplied by the groundwater well(s) and treated as necessary for potable use via a Point-of-Use (located at sink or shower) treatment system. Point-of-use treatment devices are considered a reliable and cost-effective way to address contaminants for small drinking water systems and private wells.

Table 4, below, presents an overview of water demands associated with each project phase following implementation of MM BIO-3, including construction, operation and maintenance, and decommissioning. The original demand forecast estimated that groundwater would be used for dust control over approximately 2,670 acres of temporary disturbance during construction and decommissioning. With implementation of MM BIO-3, the area of temporary disturbance is reduced to approximately 1,770 acres, and water demands for dust control have been reduced proportionally (i.e, water use at 66% of prior estimate).

With implementation of MM-3, the project's groundwater demand during the construction phase is estimated to be a maximum of 223 AF for a period of 18 months (with daily usage within the construction period varying depending on construction phase). Operational water demand for the 40-year lifespan of the project would be approximately 5.6 AFY (224 AF total) and would begin following construction. During the decommissioning process, it is assumed that water demand would be the same as construction. Total groundwater demand for the project with implementation of MM-3 would be up to 670 AF across all project phases.

Implementation of MM-3 would not change the potable water demand for personnel use. Potable water is assumed to be supplied by the groundwater well(s) and treated as necessary for potable use via a Point-of-Use treatment system.

SMSP01380

Table 3 Proposed Project Water Demands

Project Phase/Feature	Gallons/year	Avg GPD[1]	Acre-feet/year	Total AF
Non-Potable Water				
Construction (18 months)				
Dust Control	62,042,104	169,978	190.4	285.6
Initial System Demand	7,299,071	19,997	22.4	33.6
Total Construction	*69,341,175 gal/yr*	*189,976 GPD*	*212.8 AFY*	*319.2 AF*
Operation and Maintenance (40 years)				
System Wash Water (panel washing)[1]	912,384	14,482	2.80	112.00
Process Water (solar collector)	91,238	250	0.28	11.20
Facilities (non-potable)	456,192	1,250	1.40	56.00
Irrigation[2]	182,477	500	0.56	22.40
Fire Suppression[2]	182,477	500	0.56	22.40
Total Operations	*1,824,768 gal/yr*	*16,982 GPD*	*5.6 AFY*	*224.0 AF*
Decommissioning (1.5 years)				
Dust Control	62,042,104	169,978	190.4	285.6
Initial System Demand	7,299,071	19,997	22.4	33.6
Total Decommissioning	*69,341,175 gal/yr*	*189,976 GPD*	*212.8 AFY*	*319.2 AF*
Total Non-Potable Water Demand	**140,507,119 gal/yr**	**396,934 GPD**	**431.2 AFY**	**862.4 AF**
Potable Water				
Construction (18 months)				
Personnel	3,649,535	9,999	11.2	16.8
Operation and Maintenance (40 years)				
Personnel	488,735	1,339	1.5	60.0
Decommissioning (1.5 years)				
Personnel	3,649,535	9,999	11.2	16.8
Total Potable Water Demand	**7,787,806 gal/yr**	**21,336 GPD**	**23.9 AFY**	**93.6 AF**
Total Water Demand				**956 AF**

GPD = gallons per day; AF = acre-feet

1. For consistency with the operational water demands presented in this table, construction (and decommissioning) water demands are presented as an annual rate for 12 months (versus total demand for the 18-month duration of construction/decommissioning), which was calculated by dividing the total demand by 18 (months) and multiplying the result by 12 (months per year).
2. During project construction and decommissioning, the average daily use rate was calculated by dividing the annual water demand by 365 (days per year). During project operations, the maximum daily use rate for system wash water (panel washing) was calculated assuming three system wash events per year, each extending for up to three weeks, resulting in a total of 63 days per year when water demands for system washing would occur; the maximum daily use rate was calculated by dividing the total amount of wash water by 63 days, which covers nine weeks and captures all days during which system washing would occur. Average daily use rate for other operational water needs was calculated by dividing the respective water demand by 365 (days per year).
3. The *Silver LVGB Water Supply Report* (SMS 2025) identifies both 182,477 gallons and 182,459 gallons as the water demand for irrigation and fire suppression, respectively; for the purposes of this analysis, the higher amount of 182,477 gallons is used.

Source: Adjusted from SMS 2025 (to separate out potable water demands)

Table 4 Proposed Project Water Demands with MM BIO-3

Project Phase/Feature	Gallons/year	Avg GPD[2]	Acre-feet/year	Total AF
Non-Potable Water				
Construction (18 months)				
Dust Control	41,129,035	112,682	126.22	189.33
Initial System Demand	7,299,071	19,997	22.40	33.60
Total Construction	*48,428,107 gal/yr*	*132,680 GPD*	*148.6 AFY*	*222.9 AF*
Operation and Maintenance (40 years)				
System Wash Water (panel washing)[2]	912,384	14,482	2.80	112.00
Process Water (solar collector)	91,238	250	0.28	11.20
Facilities (non-potable)	456,192	1,250	1.40	56.00
Irrigation[3]	182,477	500	0.56	22.40
Fire Suppression[3]	182,477	500	0.56	22.40
Total Operations	*1,824,768 gal/yr*	*16,982 GPD*	*5.6 AFY*	*224.0 AF*
Decommissioning (1.5 years)				
Dust Control	42,407,056	116,184	130.14	195.21
Initial System Demand	7,299,071	19,997	22.40	33.60
Total Decommissioning	*48,428,107 gal/yr*	*132,680 GPD*	*148.6 AFY*	*222.9 AF*
Total Non-Potable Water Demand	**98,680,981 gal/yr**	**282,341 GPD**	**302.8 AFY**	**669.9 AF**
Potable Water				
Construction (18 months)				
Personnel	3,649,535	9,999	11.2	16.8
Operation and Maintenance (40 years)				
Personnel	488,735	1,339	1.5	60.0
Decommissioning (1.5 years)				
Personnel	3,649,535	9,999	11.2	16.8
Total Potable Water Demand	**7,787,806 gal/yr**	**21,336 GPD**	**23.9 AFY**	**93.6 AF**
Total Water Demand				**763 AF**

GPD = gallons per day; AF = acre-feet

1. Water for dust control was estimated by assuming the same reduction (66.31 percent) as the area of temporary ground disturbance, which reduced from 2,670 acres assessed in the *Silver Lake Valley Groundwater Basin (LVGB) Water Supply Report* (SMS 2025) to 1,770 acres assessed herein based on current project design. No other aspects of construction water demands changed due to the reduced temporary disturbance area.
2. For consistency with the operational water demands presented in this table, construction (and decommissioning) water demands are presented as an annual rate for 12 months (versus total demand for the 18-month duration of construction/decommissioning), which was calculated by dividing the total demand by 18 (months) and multiplying the result by 12 (months/year).
3. During project construction and decommissioning, the average daily use rate was calculated by dividing the annual water demand by 365 (days/year). During project operations, the maximum daily use rate for system wash water (panel washing) was calculated assuming three system wash events per year, each extending for up to three weeks, resulting in a total of 63 days per year when water demands for system washing would occur; the maximum daily use rate was calculated by dividing the total amount of wash water by 63 days, which covers nine weeks and captures all days during which system washing would occur. Average daily use rate for other operational water needs was calculated by dividing the respective water demand by 365 (days/year).
4. The *Silver LVGB Water Supply Report* (SMS 2025) identifies both 182,477 gallons and 182,459 gallons as the water demand for irrigation and fire suppression, respectively; for the purposes of this analysis, the higher amount of 182,477 gallons is used.

Source: Adjusted from SMS 2025 (to separate out potable demands and incorporate MM BIO-3)

5.1 Construction Water Demand

Construction of the proposed project would occur over approximately 18 months (1.5 years) and would require up to approximately 213 AFY or 319 AF total. With implementation of MM BIO-3 (which will reduce the amount of water needed for dust control), construction water demands would be 149 AFY or 223 AF total. The project's average daily water use rate during construction is estimated to be 132,680 GPD. During construction, water would be used primarily for dust control and soil compaction during grading activities. Daily water demand during construction would likely decrease following the initial period of intensive ground disturbance.

5.2 Operation and Maintenance Water Demand

Operational water use would primarily involve the periodic washing of photovoltaic modules, or "panel washing." It is assumed that panel washing would be conducted three times per year, depending on weather conditions and the rate of dust collection on the panels. Each panel-washing cycle would extend for up to three weeks. Water for panel washing would be conveyed throughout the project's solar arrays using a water truck, with panel washing conducted using a truck-mounted pressure washer. No additives, detergents, or water quality treatment would be required to prepare the local groundwater for use in panel washing.

The solar collector would also require approximately 0.27 AFY (91,238 gallons per year), and additional non-potable uses would account for an estimated 1.4 AFY (456,192 gallons per year) during operations. Limited landscape irrigation would be applied, requiring approximately 0.56 AFY (182,459 gallons per year). Fire suppression would also require approximately 0.56 AFY (182,459 gallons per year). During the project's 40-year operational phase, maximum daily water use rates would occur during the panel-washing cycles, which are assumed to extend for up to 63 days per year.

Water Mass and Heat Balance

Water mass balance diagrams are typically used to quantify and manage water input, output, and losses in systems where water is actively circulated, evaporated, or treated, such as in concentrated solar power plants with cooling systems. Similarly, heat balance diagrams are relevant in projects involving significant heat energy transfers, such as those using steam turbines to convert solar energy into electricity. Water usage for the proposed project involves standard construction and operational water use with the biggest driver of long-term water use going toward panel cleaning. The process uses groundwater without any significant thermal energy transformation; therefore, no water mass balance or heat balance diagrams are provided herein.

5.3 Decommissioning Water Demand

Upon completion of the functional operating life of the project, the facility would be decommissioned to remove project components and restore the site. For the purposes of this analysis of water supply, it is assumed that water demands during decommissioning would be comparable in duration and scale to water demands during construction (see Section 5.1, *Construction Water Demands*).

6 Impact Analysis

The proposed project may include the installation of up to five new on-site groundwater wells to produce water supply for the project from the Soda Mountain Subbasin of the Soda LVGB, as assessed herein. The project supply well(s) would represent a source of basin outflow in amounts equal to or less than the project's water demands, as detailed in Section 5, *Project Water Demand*. (As an alternative or additional water supply source, the project may obtain some or all of its water demand from an existing water supply well in the Silver Lake Valley Groundwater Basin identified by WCR Number 2020-016662, as analyzed in the *Silver LVGB Water Supply Report* (SMS 2025).) No other uses have been identified for the project's potential on-site water supply well(s); therefore, outflow associated with the project's potential on-site water supply well(s) would be equal to or less than the project's water demands.

6.1 Water Availability

Water availability for the Soda Mountain Subbasin of the Soda LVGB is assessed herein using the technical studies completed for the *Soda Mountain Solar Project PPA/FEIS/EIR* (BLM 2015). This approach involves considering the potential for project-related pumping to result in drawdown of groundwater levels in the groundwater basin. In addition, the amount of water that may be in storage in the Subbasin was calculated to understand project impacts. Conclusions regarding the data and analysis presented below are presented in Section 7, *Conclusions*.

6.1.1 Groundwater Levels

As reported in DWR's Bulletin 118 (2004) for the Soda LVGB, groundwater levels in the basin have been generally stable over the period of record, although declining levels have been observed in some wells. Groundwater level measurements near the town of Baker, in the northern portion of the basin, indicated drawdown (increased depth to groundwater) of one to two feet over the 30 years between 1954 and 1984 (DWR 2004a). This drawdown may have been caused by growth of the town itself following its establishment in 1929. Due to the small population overall, and the lack of other municipalities or developed areas near the project site, groundwater level trends in the project area are assumed to be uninfluenced by municipal uses.

The groundwater modeling simulations completed for an earlier version of the project show that there is adequate groundwater in the Soda Mountain Subbasin to support construction, operation, and maintenance of the project without adversely affecting nearby wells or sensitive water resources (BLM 2015). Groundwater pumping simulations conducted using both low-end and high-end recharge rates and corresponding low-end and high-end hydraulic conductivity values (as recommended by NPS and USGS) indicate a decline in the groundwater table of less than 1 foot to approximately 2 feet at the nearest bedrock interface east of the wells after 3 years of construction and over the operational period of the project (TRC Solutions 2013). Given the current understanding of the hydrogeology, as well as the current understanding of the one existing well in the Subbasin that may be affected by project-induced drawdown, it is unlikely that groundwater pumping for the project would cause any nearby wells to go dry or be severely impaired or rendered unusable by declining groundwater levels (BLM 2015). Moreover, model results indicate the outflow of groundwater from the Subbasin's northeast outlet would be reduced during construction and operation by 4.6 AFY or less due to groundwater use for the project (TRC Solutions 2013).

SMSP01384

Groundwater outflow from the Soda Mountain Valley would return to pre-existing conditions after decommissioning of the project. Detailed results for each of the model scenarios are provided in the *Soda Mountain Solar Project Hydrogeological Conditions and Groundwater Modeling Report Addendum* (TRC Solutions 2013).

Estimated project demands for the project have been reduced since the groundwater modeling was completed in 2013 and 2014. The groundwater modeling simulations completed for an earlier version of the project assumed 576 AF for construction and 990 AFY for operations and maintenance (33 AFY over a 30-year operational period), or a total of 1,566 AF. This is substantially greater than the current project estimates of 862 AF (or 670 AF with implementation of MM BIO-3) for project construction, operations and maintenance, and decommissioning. As such, the findings associated with groundwater impacts are still valid.

6.1.2 Safe Yield

The proposed use of water for construction, operation, and maintenance of the project is within the safe yield of the Subbasin. As described in Section 4, *Groundwater Basin and Climate* above, the low-end (3 percent) and high-end (10 percent) recharge rates used in the groundwater model provide a total input of 376 to 1,330 AFY of recharge (corresponding to 0.12 to 0.4 inches of recharge per year) (TRC Solutions 2013). Using the high end of potential Rasor Road Service Station use and the low end of the estimated recharge rate to be conservative, the safe yield of the Soda Mountain Subbasin is calculated as 357 AFY. Estimated annual project groundwater demand of 213 AFY (or 149 AFY with implementation of MM BIO-3) for the 1.5 years of construction and decommissioning will remain within this safe yield. The projected operational pumping of 5.6 AFY falls well within the safe yield. Project water supply needs could be sustainably met through the proposed production wells.

6.1.3 Total Groundwater in Storage

Table 5, *Total Water in Storage*, below, presents the estimated amount of groundwater in storage in the Soda Mountain Subbasin of the Soda LVGB. Based on the groundwater well test completed for the project, the thickness of the saturated alluvium was estimated at approximately 125 feet based on the observed geology (including a portion of the underlying weathered bedrock) and Subbasin storage was estimated to be approximately 375,000 AF (BLM 2015). Anticipated groundwater use for the project is a small fraction of the groundwater in storage within the Subbasin.

Table 5 Total Water in Storage (AF)

Metric	Value
Total volume in storage	375,000 AF
Total groundwater demand over project lifecycle	862 AF (670 AF with MM BIO-3)
% project use of groundwater in storage	0.0023% (0.0018% with MM BIO-3)

The table above shows that the total amount of water estimated to be in storage in the Subbasin is approximately 375,000 AF. The project's maximum total water demand of 862 AF represents approximately 0.002 percent of the estimated total amount of groundwater available in storage in the Subbasin. This is considered negligible compared to the overall size of the Subbasin and the larger Soda LVGB. In addition, this estimate accounts for the project's entire water demand being removed at once; in reality, water would be removed as needed throughout the project's implementation phases, including 1.5 years of construction, 40 years of operation, and 1.5 years of decommissioning.

SMSP01386

7 Conclusions

The project may source non-potable water from up to five new on-site wells producing groundwater from the Soda Mountain Subbasin of the Soda LVGB. This analysis assumes that during all project phases, potable water would be supplied by the groundwater well(s) and treated as necessary for potable use via a Point-of-Use treatment system.

Groundwater demands would total 862 AF (670 AF with implementation of MM BIO-3) over the life of the project. Groundwater modeling and well testing completed for an earlier version of the project determined that a decline in the groundwater table of less than 1 foot to approximately 2 feet at the nearest bedrock interface east of the wells after 3 years of construction and over the operational period of the project (TRC Solutions 2013). This modeling assumed higher construction water demands and over a longer timeframe than the current proposed project. Given the current understanding of the hydrogeology, as well as the current understanding of the one existing well in the Subbasin that may be affected by project-induced drawdown, it is unlikely that groundwater pumping for the project would cause any nearby wells to go dry or be severely impaired or rendered unusable by declining groundwater levels (BLM 2015).

The projected annual construction, operation and maintenance, and decommissioning pumping for the project (up to 213 AFY (or 149 AFY with implementation of MM BIO-3) during construction and decommissioning, and 5.6 AFY during operation) falls within the safe yield of the Soda Mountain Subbasin, which is calculated as 357 AFY. Project water supply needs could be sustainably met through the up to five potential on-site production wells.

Table 6, *Comparison of Project Water Demands to the Estimated Storage*, below, presents an overview of the project's annual water demands for each phase of implementation, with comparison of each to the Subbasin's estimated total storage volume of 375,000 AF. Anticipated groundwater use for the project is a small fraction of the groundwater in storage within the Subbasin.

Table 6 Comparison of Project Water Demands to the Estimated Storage in Subbasin

Project Phase / Feature	Duration	Annual Demand (AFY)	Percentage of Storage
Construction	1.5 years	213 (149 with MM BIO-3)	0.00057 (0.0004 with MM BIO-3)
Operation & Maintenance	40 years	5.60	0.00001
Decommissioning	1.5 years	213 (149 with MM BIO-3)	0.00057 (0.0004 with MM BIO-3)

AFY = acre-feet per year

The table above shows that during the project's most intensive water-use phases—construction and decommissioning—annual project water demands would represent approximately 0.00057 percent (0.0004 percent with implementation of MM BIO-3) of the total amount of water estimated to be in storage in the Soda Mountain Subbasin. Over the project's 40-year operational lifespan, annual water demands would represent approximately 0.002 percent of the total amount of water in storage in the Subbasin.

Based on modeled impacts to groundwater levels, calculated safe yield of the aquifer, and percentage used of total available storage, this assessment concludes that the Soda Mountain Subbasin of the Soda LVGB may be used to meet all water demands of the project without resulting in adverse impacts. Potential drawdown would be negligible and temporary; the Subbasin would recover from the initial drawdown of pumping activities during constant-state pumping, as well as following the cessation of project-related pumping. No groundwater quality treatment would be necessary for non-potable use. Potable water is assumed to be supplied by the groundwater well(s) and treated as necessary for potable use via a Point-of-Use treatment system.

SMSP01388

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SMSP01390

From: Hannah Arkin [hannah@resolutionenvironmental.com]
Sent: 7/28/2025 9:25:53 PM
To: Worrall, Lisa@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4bbc7048b38485084bdb03fb494b25b-Worrall, Li]
CC: Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]
Subject: Re: Hybrid Informational/Scoping Meeting Arrangements - Soda Mountain Solar Project

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Hi Lisa,

Yes, we will make this work. Stay tuned and thank you!

Hannah

Hannah Arkin
CEO
Resolution Environmental
262 B Avenue, Coronado, CA 92118
760-504-4109

From: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Sent: Monday, July 28, 2025 2:24:03 PM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Re: Hybrid Informational/Scoping Meeting Arrangements - Soda Mountain Solar Project

Hi Hannah,

We only have one viable date for the Environmental Scoping and Informational Meeting, August 29th. The meeting will be held for 3 to 7, but depending upon the number of participants, it may finish earlier or extend beyond 7pm.

Can you use that information as you look for venues. I anticipate about 45 people in person (including applicant and staff) and 30 people via Zoom.

Thanks kindly,

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

715 P Street, MS-40, Sacramento, CA 95814
1-916-661-8367

California Energy Commission
Website: www.energy.ca.gov

From: Hannah Arkin <hannah@resolutionenvironmental.com>
Sent: Wednesday, July 23, 2025 5:34 PM
To: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Cc: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Re: Hybrid Informational/Scoping Meeting Arrangements - Soda Mountain Solar Project

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Absolutely! I am on it and will keep you posted.

Thank you!
Hannah

Hannah Arkin
CEO
Resolution Environmental
262 B Avenue, Coronado, CA 92118
760-504-4109

From: Worrall, Lisa@Energy <Lisa.Worrall@energy.ca.gov>
Sent: Wednesday, July 23, 2025 5:32:38 PM
To: Hannah Arkin <hannah@resolutionenvironmental.com>
Cc: Chang, Kaycee@Energy <kaycee.chang@energy.ca.gov>
Subject: Hybrid Informational/Scoping Meeting Arrangements - Soda Mountain Solar Project

Hello Hannah,

Thank you for offering to help with securing a meeting site when we were discussing the Soda Mountain schedule last Friday. If you are still open to it, we would like to request you take the lead in assisting us with securing a hybrid meeting venue for the informational/scoping meeting that must occur within 30 days of the application being deemed complete. As noted in the attached guidance, we do retain oversight and need to be informed of progress. Due to the timing for this application, some of the information in the guidance, such as the timeframes to communicate with me as the PM, do not apply. In addition, we began some of our scoping efforts in anticipation of the application being complete. Please review the attached spreadsheet, add any additional potential venues you are aware of, and proceed with Step #6 in the document (informing me of your top 3 venue recommendations).

Email Attachments

1. Hybrid Meeting Scoping and Arrangements - guidance on steps, communications with project manager, and additional arrangements
2. Public Meeting Venue Scoping_SodaMountain - spreadsheet on potential locations

Please let us know if you have any questions, and I look forward to hearing your updates.

Thank kindly,

Lisa Worrall
Senior Environmental Planner
CEQA Project Management Unit
Siting, Transmission and Environmental Protection Division (STEP)

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California Energy Commission
Website: www.energy.ca.gov



From: Hannah Arkin [hannah@resolutionenvironmental.com]
Sent: 7/29/2025 8:38:29 PM
To: Worrall, Lisa@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e4bbc7048b38485084bdb03fb494b25b-Worrall, Li]; Chang, Kaycee@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd3d2fc8670840bda4acdc455903e787-Chang, Kayc]
Subject: Soda Mt. DR REV 2 PH-1 and DR REV 2 GHG-1
Attachments: App C_Soda Mt Solar Project_AQ GHG Report_7-29-25_Redacted.pdf

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Hi Lisa,

Please see responses to DR REV 2 PH-1 and DR REV 2 GHG-1 below. The non-confidential version is attached and I will redocket the confidential report as well.

DR REV 2 PH-1.	***Please provide the UL 9540A test report for the CATL EnerC Plus BESS alternative as requested in REV 1 DR WS-2 and REV 1 DR PH-1. Please also provide the total number of cells and modules per container for the CATL EnerC Plus BESS alternative.*** The UL 9540A test report for the CATL EnerC Plus BESS alternative will be provided as a confidential appendix. (Appendix D). Page 4 of the UL 9540A test report provides the number of modules in the BESS (8) and the number of cells in the module (104). Appendix C-1 Air Quality and Greenhouse Gas Technical Report - July 2025 - Revision 3 - Appendix D.

DR REV 2 GHG-1.	***Please clarify how the project would comply with the CARB HFC regulation.*** It has been confirmed by Tesla that they are in the process of receiving a variance from CARB allowing the Megapack 2XL to defer the refrigerant compliance under CARB regulation Prohibitions on Use of Certain Hydrofluorocarbons (HFCs) in Refrigeration, Stationary Air-Conditioning, and Other End-Uses (https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2020/hfc2020/frorevised.pdf) (17 Cal. Code Regs., § 95371 et seq.) to a later date (TBD). The variance application will be approved within the next few months. Appendix C-1 Air Quality and Greenhouse Gas Technical Report - July 2025 - Revision 3 – Page 45

Hannah Arkin
CEO
Resolution Environmental
262 B Avenue, Coronado, CA 92118
760-504-4109

Air Quality and Greenhouse Gas Technical Report
Soda Mountain Solar Project
San Bernardino County, California

JULY 2025

PREPARED FOR

Soda Mountain Solar, LLC

PREPARED BY

SWCA Environmental Consultants

AIR QUALITY AND GREENHOUSE GAS TECHNICAL REPORT SODA MOUNTAIN SOLAR PROJECT SAN BERNARDINO COUNTY, CALIFORNIA

Prepared for

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July 2025

CONTENTS

1 Introduction 1

2 Project Location and Description 1

2.1 Project Location 1

2.2 Project Description 2

2.2.1 Solar Panel Arrays and Support Structures 2

2.2.2 Substation and Switchyard 3

2.2.3 Gen-tie Line 3

2.2.4 Battery Energy Storage System 3

2.2.5 Operations and Maintenance 4

2.3 Construction Time Frame and Phasing 8

3 Environmental Setting 9

3.1 Overview of Air Pollution and Potential Health Effects 9

3.1.1 Criteria Air Pollutants 9

3.1.2 Volatile Organic Compounds 12

3.1.3 Toxic Air Contaminants 12

3.1.4 Odors 15

3.2 Existing Air Quality Conditions at the Project Site 15

3.2.1 Regional Air Quality 15

3.2.2 Regional Attainment Status 16

3.2.3 Local Air Quality 16

3.3 Greenhouse Gas Setting 21

3.3.1 Greenhouse Gas Background 21

3.3.2 Greenhouse Gas Emissions Inventories 23

4 Regulatory Setting 24

4.1 Federal 24

4.1.1 Federal Clean Air Act 24

4.1.2 Toxic Substance Control Act 25

4.1.3 National Emission Standards for Hazardous Air Pollutants (Asbestos) 25

4.2 State 26

4.2.1 California Clean Air Act 26

4.2.2 California Code of Regulations 26

4.2.3 Toxic Air Contaminants Regulations 26

4.2.4 Executive Order S-3-05, Executive Order B-30-15, and Executive Order B-55-18 27

4.2.5 Assembly Bill 32 – California Global Warming Solution Act 28

4.2.6 Climate Change Scoping Plan 29

4.2.7 Assembly Bill 197 29

4.2.8 Cap-and-Trade Program 29

4.2.9 Senate Bill 1078 (California Renewables Portfolio Standard) 30

4.2.10 Senate Bill 350 30

4.2.11 Senate Bill 100 30

4.2.12 Senate Bill 1368 30

4.2.13 Assembly Bill 1493 (Pavley I) 31

4.2.14 California Code of Regulations Section 95350 et seq. 31

4.2.15 Executive Order S-01-07 (California Low Carbon Fuel Standard) 32

4.2.16 Advanced Clean Car Regulations 32

4.2.17 Senate Bill 375 32

4.2.18 Senate Bill 97 32
4.3 Local 33
4.3.1 Mojave Desert Air Quality Management District 33
4.3.2 Southern California Association of Governments 35
4.3.3 San Bernardino County Policy Plan 35
4.3.4 County of San Bernardino Regional Greenhouse Gas Reduction Plan 36
4.4 California Energy Commission's (CEC) Opt-in Certification Program 36
5 Thresholds of Significance 37
5.1 Air Quality 37
5.1.1 Carbon Monoxide Hotspots 38
5.1.2 Toxic Air Contaminants 39
5.2 Greenhouse Gases 39
5.3 Displaced Grid Electricity Emissions 40
6 Methodology 41
6.1 Construction Emissions 41
6.1.1 Construction Assumptions 41
6.2 Operational Emissions 43
6.3 Greenhouse Gas 46
6.4 Toxic Air Contaminants Impacts (Construction and Operations) 46
7 Impact Analysis 47
7.1 Applicant-Proposed Measures 47
7.2 Environmental Impacts 48
7.3 Cumulative Impacts 57
7.3.1 Air Quality 57
7.3.2 Greenhouse Gas Emissions 58
7.4 Air Quality Construction Management Plan 58
8 Literature Cited 60

Appendices

APPENDIX A CalEEMod Results – Air Pollutant and GHG Emission Calculations
APPENDIX B Baseline Environmental Consulting Air Quality Technical Report Memorandum
APPENDIX C Baseline Environmental Consulting Supplemental Air Quality Analysis for Battery Energy Storage System Thermal Runaway Event
APPENDIX D CATL EnerC Plus BESS UL 9540A Test Report (Confidential)

Figures

Figure 1. Project site vicinity. 6
Figure 2. Site plan. 7

Tables

Table 1. State and Federal Ambient Air Quality Standards 14
Table 2. Federal and State Ambient Air Quality Attainment Status 16
Table 3. Summary of Ambient Air Quality Monitoring Summary – Trona Monitoring Station 17
Table 4. Summary of Ambient Air Quality Monitoring Summary – Barstow Monitoring Station 18
Table 5. Summary of Ambient Air Quality Monitoring Summary - Ridgecrest – Ward Monitoring Station 18
Table 6. Summary of Ambient Air Quality Monitoring Summary - Fontana Monitoring Station 18
Table 7. California Greenhouse Gas Inventory 19
Table 8. Global Warming Potentials 23
Table 9. MDAQMD Air Quality Significance Thresholds 37
Table 10. Construction Anticipated Schedule, Trips, and Equipment 42
Table 11. Unmitigated Construction Emissions Summary 49
Table 12. Unmitigated Operational Emissions Summary 50
Table 13. Estimated Daily and Annual Construction Greenhouse Gas Emissions 55
Table 14. Estimated Annual Operational GHG Emissions 55

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ACRONYMS AND ABBREVIATIONS

$\mu g/m^3$	micrograms per cubic meter
AB	Assembly Bill
AC	alternating current
APCO	Air Pollution Control Officer
APM	applicant-proposed measure
AQMP	Air Quality Management Plan
AVERT	AVoided Emissions and geneRation Tool
BESS	battery energy storage system
BLM	Bureau of Land Management
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emission Estimator Model
CalEPA	California Environmental Protection Agency
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CAT	California Action Team
CCAA	California Clean Air Act
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
DC	direct current
DCP	Dust Control Plan
DPM	diesel particulate matter
EO	Executive Order
EPA	U.S. Environmental Protection Agency
GHG	greenhouse gas
GHG Plan	San Bernardino County Greenhouse Gas Reduction Plan
GWP	global warming potential
H_2S	hydrogen sulfide
HFC	hydrofluorocarbon

HVAC	heating, ventilation, and air conditioning
I-15	Interstate 15
IPCC	Intergovernmental Panel on Climate Change
kV	kilovolt
LADWP	Los Angeles Department of Water and Power
LCFS	Low Carbon Fuel Standard
MDAB	Mojave Desert Air Basin
MDAQMD	Mojave Desert Air Quality Management District
MMT	million metric tons
MT	metric ton
MW	megawatt
MWh	megawatt-hour
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NCDC	National Climatic Data Center
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	oxides of nitrogen
O_3	ozone
OEHHA	California Office of Environmental Health Hazard Assessment
OPR	Governor's Office of Planning and Research
PFC	perfluorocarbon
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PM_{10}	particulate matter less than 10 microns in diameter
ppb	parts per billion
ppm	parts per million
project	Soda Mountain Solar Project
PV	photovoltaic
RPS	Renewable Portfolio Standard
RTP	Regional Transportation Plan
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCOTUS	Supreme Court of the United States
SCS	Sustainable Communities Strategy
SF_6	sulfur hexafluoride
SIP	State Implementation Plan

SO_2	sulfur dioxide
SO_x	sulfur oxides
SWCA	SWCA Environmental Consultants
TAC	toxic air contaminant
TRU	transport refrigeration unit
TSCA	Toxic Substances Control Act
VOC	volatile organic compound
ZEV	Zero Emission Vehicle

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EXECUTIVE SUMMARY

This report analyzes potential air quality and climate change impacts related to the Soda Mountain Solar Project. All analyses have been conducted to comply with Mojave Desert Air Quality Management District (MDAQMD) requirements for air quality and climate change assessments and satisfy the requirements of the California Environmental Quality Act (CEQA). The findings are as follows:

- The project's unmitigated emissions during construction and operations would not exceed MDAQMD annual or daily significance emissions thresholds.
- The project includes an applicant committed measures (APM1-9) to further reduce emissions and comply with MDAQMD rules.
- The project would not result in significant elevated health risks at sensitive receptors due to proximity to nearby pollution sources.
- The project's carbon monoxide (CO) emissions during long-term project operations would not create any new or exacerbate any existing CO hot spots.
- The project would be consistent with rules, regulations, emission control strategies and air quality plans set forth by MDAQMD.
- The project would be consistent with the AB 32 scoping plan strategies, CARB's emission reduction strategy presented in the Scoping Plans, and the San Bernardino County Policy Plan and GHG Plan.
- The project implementation would help California meet its RPS requirements.
- The project would not result in a cumulatively considerable air quality or greenhouse gas impact.

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) prepared this air quality and greenhouse gas (GHG) emissions technical report in support of the proposed Soda Mountain Solar Project (project). The project would be developed by Soda Mountain Solar, LLC (applicant). The project site is located in unincorporated San Bernardino County, California, approximately 50 miles northeast of Barstow (Figure 1).

The purpose of this report is to explain the methodologies used to evaluate the effects of the proposed construction, operation, maintenance, and decommissioning of a utility-scale solar photovoltaic (PV) electrical generating and storage facility and associated infrastructure project on ambient air quality and GHG emissions. This air quality technical report provides a summary of the air pollutant and GHG emissions calculation methodologies, a summary of the mitigation measures assumed, and the results of the air pollutant and GHG emissions calculations.

The project site is located within the Mojave Desert Air Basin (MDAB), under the jurisdiction of the Mojave Desert Air Quality Management District (MDAQMD). The evaluation of project impacts was conducted as recommended by the MDAQMD California Environmental Quality Act (CEQA) guidance dated February 2020 (MDAQMD 2020), which is incorporated into this technical document by reference.

2 PROJECT LOCATION AND DESCRIPTION

2.1 Project Location

The project is located entirely on federally owned land managed by the BLM. The 2,670-acre project site is located approximately 7 miles southwest of the community of Baker in unincorporated San Bernardino County, California (Figures 2-3 and 2-4), approximately 50 miles northeast of Barstow. The project site is located in portions of Sections 1 and 11–14, Township 12 North, Range 7 East; Sections 25, Township 13 North, Range 7 East; Sections 6, 7, and 18, Township 12 North, Range 8 East; Sections 17 – 21, 29-32, Township 13 North, Range 8 East,, San Bernardino Meridian, California.

The project would occupy the alluvial valley dividing the northern and southern portions of the Soda Mountains in the Mojave Desert. The project site is composed of rural desert land and is almost entirely undeveloped.

The project is bounded directly to the east by the Mojave National Preserve (administered by the National Park Service) and BLM-managed land, including the Rasor Off-Highway Vehicle (OHV) recreation area at the southeast corner. Rasor Road, an unimproved BLM public access road, runs from the southwest corner of the site and splits into two forks. I-15, the former Arrowhead Trail Highway, runs along the western boundary of the project site, with Rasor Road Services Shell Oil gas station located off I-15 southwest of the project site, along the access road to the project site.

The project is not situated close to any non-residential sensitive receptors, such as schools, hospitals, daycare centers, or long-term care establishments. The nearest schools, Baker Elementary, Middle, and High Schools, are over 6.5 miles away, situated in the northeastern part of Baker. The closest residences to the project location can be found next to the Rasor Road service station, roughly 260 feet southwest of the proposed boundary. This area encompasses a stand-alone house and accommodation for four workers.

2.2 Project Description

The project proposes to construct, operate, maintain, and decommission a proposed 300-megawatt (MW) photovoltaic (PV) solar facility located on approximately 2,670 acres. The approximate disturbance acreage for the project would be 2,112 acres. As shown in Figure 2, the project components are as follows:

1. The solar plant site (i.e., all facilities that create a footprint in and around the field of solar panels, including the solar field consisting of solar power arrays identified as the East Array and South Arrays 1, 2, and 3), operation and maintenance (O&M) buildings and structures, stormwater infrastructure, and related infrastructure and improvements.
2. A substation and switchyard for interconnection to the existing transmission system.
3. Gen-tie line connecting project substation, switchyard, and 500-kV Mead-Adelanto line.
4. Approximately 300 MW/1,200 MWh of battery energy storage system (BESS) across 18 acres.

The project would operate 24 hours per day year-round and would generate electricity during daylight hours when the sun is shining. The project would generate up to 300 MW of renewable energy and include up to 300 MW of battery storage. The project would generate and deliver solar-generated power to the regional electrical grid through an interconnection with the existing Mead-Adelanto 500- kilovolt (kV) transmission line operated by Los Angeles Department of Water and Power (LADWP).

2.2.1 Solar Panel Arrays and Support Structures

Solar cells, also called photovoltaic (PV) cells, convert sunlight directly into electricity (voltage), which is called the "PV effect." PV cells are located on panels; rows of solar panels form an array. The PV modules are uniformly dark in color, non-reflective, and designed to be highly absorptive of all light that strikes their glass surfaces. Arrays controlled by a single motor create a system called a single-axis solar tracker, which rotates throughout the day to increase total solar exposure. For the project, hundreds of solar trackers would be interconnected to form a utility-scale PV system.

The single-axis solar tracker would be mounted on structures supported by steel piles (e.g., cylindrical pipes, H-beams, or similar), which would be driven into the soil using pile/vibratory/rotary driving technique. Driven pier foundations are a "concrete-free" foundation solution that would result in minimal site disturbance and facilitate site reclamation during decommissioning. Most pier foundations would be driven to approximate depths of 6 to 12 feet deep depending upon the required embedment depth. The piles would be spaced 10 to 15 feet apart. The support structure would be elevated at least 1 foot above the base flood elevation and approximately 6 to 12 feet tall, depending on site topography.

Solar panels would be electrically connected using string wiring secured to the panel support system. String wiring terminates at PV array combiner boxes or load break disconnect boxes, which are lockable electrical boxes mounted on or near an array's support structure. Output wires from combiner boxes would be routed along an underground trench system approximately 3 to 6 feet deep and 1 to 6 feet wide, including trench and disturbed area, to the central inverter pads. Inverters are a key component of solar PV power-generating facilities because they convert the solar panel's direct current (DC) power into AC power and step up the voltage for use with the transmission network. The output voltage of the inverters would be stepped up from 600 to 1,200V DC to 34.5kV AC power and transmitted by underground collection lines to the project substation..

2.2.2 Substation and Switchyard

The 140,000-square-foot high-voltage substation would be located adjacent to Area 1 and Area 2 on a raised gravel pad and would have a maximum height of 35 feet (see Figure 2). The substation would include the main Generation Step Up (GSU) transformer, high-voltage circuit breakers, switches, meters, instrumentation transformers, relay equipment, a control enclosure, and related equipment. The substation equipment would be mounted on concrete foundations and steel structures (hot dip galvanized or weathering steel).

All the underground 34.5-kV collection lines would be combined at the substation, and the voltage would be stepped up to 500 kV via the GSU transformer. All interconnection equipment, including the control room, would be installed aboveground on concrete foundations and steel structures within the substation footprint.

Power to the project substation control enclosure would be provided primarily by a station service transformer (roughly 50 kilovolt amps [kVA]) located within the substation yard. The control enclosure would be equipped with a backup battery and an energy management system capable of powering the control enclosure for 48 hours in the event of an outage. In the event of a prolonged outage, a secondary power source will be provided via an underground connection to Kramer 115-kV sub-transmission line owned by SCE, which runs parallel to I-15.

The switchyard would be set on an approximately 234,300-square-foot raised gravel pad and would have a maximum height of 100 feet. The switchyard would be located 0.8-mile northwest of I-15, adjacent to the LADWP Mead-Adelanto 500-kV transmission line ROW. The switchyard would include the High Voltage Bus Structure, high-voltage circuit breakers, switches, instrumentation transformers, relay equipment, a control enclosure, and related equipment. Like the substation, the switchyard equipment would be mounted on concrete foundations and steel structures (hot dip galvanized or weathering steel).

Power to the switching station control enclosure would be provided primarily by a station service transformer (roughly 50 kVA) located within the substation yard. The control enclosure would be equipped with a backup battery and an energy management system capable of powering the control enclosure for 48 hours in the event of an outage. In the event of a prolonged outage, a secondary power source will be provided via an underground connection to Kramer 115-kV sub-transmission line owned by SCE, which runs parallel to I-15.

2.2.3 Gen-tie Line

The approximately 1-mile 500-kV gen-tie line would be designed in accordance with LADWP design standards including required right-of-way (ROW) width. The gen-tie would also use eleven tubular steel pole support structures and six lattice towers, all of which would be approximately 160 feet high. A small segment of the gen-tie line, approximately 450 feet, would go under I-15 near an existing Caltrans culvert. On either end of this underground section there would be riser towers and transition to overhead tower structures. Both the underground section of the gen-tie line and the riser towers would be designed in accordance with General Order 128.

2.2.4 Battery Energy Storage System

A BESS absorbs, holds, and then reinjects electricity into the electrical grid. The project is anticipated to include up to 300 MW/1,200 MWh of BESS for dispatch into the local electrical grid via the same point of interconnection as the solar arrays. The BESS would be located adjacent to the substation and Area 1. Up to 18 acres may be utilized for the BESS throughout the project site at full buildout.

The BESS containers would house the batteries described above, as well as the BESS unit controllers. There would also be a site controller, located in a pad mount enclosure within the BESS yard. The BESS site controller is a multilevel control system for the battery modules, power conversion system, medium-voltage system, and up to the point of connection with the electrical grid. The controllers ensure that the BESS effectively mimics conventional turbine generators when responding to grid emergency conditions. The BESS enclosure would also house required heating, ventilation, and air conditioning (HVAC) and fire protection systems. The battery storage containers would be built using standard International Organization for Standardization (ISO) shipping containers, and each would measure approximately 20 feet in length, 6 feet in width, and 8 feet in height, although other smaller form-factor structures exist that may be used. The containers would be painted Sudan Brown.

The safety system would include a fire detection, alarm, and suppression control system that would be triggered automatically when the system senses imminent fire danger. A fire suppression control system would be provided within each on-site battery enclosure. The safety system would use either a waterless evaporating fluid, a sustainable clean agent (not a hydrofluorocarbon clean agent), or an alternative suppression agent, such as an inert gas. The control system would also notify the project operators and could be configured to notify local first responders as well.

The battery energy storage system (BESS) units are fully certified to the most rigorous international safety standards including UL 9540A - Standard Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems. The BESS that will be utilized for this project is the Tesla MegaPack 2XL and a copy of the UL 9540A report, including measured emissions of criteria air pollutants, toxic air contaminants, greenhouse gases (GHG), and hazardous materials, is provided in Attachment A of Appendix C (confidential). In addition, Appendix D is the UL 9540A test report for the CATL EnerC Plus BESS, which provides the number of modules in the BESS and the number of cells in the module (page 4).

2.2.5 Operations and Maintenance

The following permanent buildings would be constructed as part of the project:

1. Operation and maintenance building (approximate dimensions: 5,000 square feet, 30 feet high)
2. Maintenance facility (approximate dimensions: 2,400 square feet, 35 feet high)
3. Warehouse facility (approximate dimensions: 5,000 square feet, 35 feet high)
4. Substation (approximate dimensions: 140,000 square feet)

The operation and maintenance building, maintenance facility, and warehouse facility would all be located at the southwest corner of the site. The operation and maintenance building may consist of offices, a restroom, and a storage area and would include an HVAC system. Parking areas would be located adjacent to the buildings described above, in the southwest corner of the site. The parking areas are not expected to exceed approximately 0.33 acre, or 13,200 square feet. Parking would be provided for the anticipated regular employees during project operation, for visitors, and for other equipment anticipated to be on-site at any time.

Primary operational access to the project site would be provided via a gated entrance off Rasor Road, which can be accessed approximately 250 feet south from the I-15 northbound off-ramp. The project would maintain and improve the existing Rasor Road that runs from I-15 eastward to the Rasor OHV recreation area. Northwest of I-15, the project would construct an access road up to 26 feet wide underneath the gen-tie line to access the gen-tie line and switchyard. All project components would be

surrounded by warning signage, perimeter security fencing, desert tortoise exclusionary fencing, and perimeter security cameras.

Lighting would be provided at the Rasor Road site entrance, operation and maintenance building, substation, and switchyard. Exterior security lighting would be installed to provide safe access to project facilities as well as visual surveillance. Some portable lighting also could be required for essential nighttime maintenance activities. All lighting would be kept to the minimum required for safety and security; sensors, motion detectors, and switches would be used to keep lighting turned off when not required. All lights would be downward, shielded, and directed so as to minimize light exposure.

Operational needs at the site include monitoring and optimizing the power generated by the solar arrays and interconnection with the transmission lines, operating the Supervisory Control and Data Acquisition (SCADA) system, troubleshooting the collector lines and repairing damaged cables, replacing PV panels, and conducting panel-washing activities periodically through the year. Additional maintenance would be required to maintain the administrative buildings, fencing and signage, roadways, and other ancillary facilities at the site. The project substation would be uncrewed during operation; however, a workforce of approximately 2 to 4 personnel would visit the substation as needed for maintenance, equipment operation, and/or security.

Project operation would require water for dust control, panel washing, and fire protection. Water used for construction would be supplied by a private groundwater well in Baker, San Bernardino County. This water would be trucked in from these wells and installed in three permanent water storage tanks to support project operations. Approximately three 10,000-gallon water tanks would be installed on a high point near the operation and maintenance building to provide storage of panel-washing water. Water would be used to clean the PV panels; dust and dirt buildup reduces the amount of incoming solar radiation striking the active PV layer within the panel. To reduce this effect, panel washing with water stored in the three 10,000-gallon water tanks would be conducted three times per year over a 3-week period during operations, or additionally as necessitated. The water would drain by gravity to panel-washing trucks for use. The project estimates that each panel washing, including additional miscellaneous operational water needs, would require approximately 2.8 acre-feet (912,384 gallons) of water per year. In total, an estimated 5.6 acre-feet per year of water would be used for panel washing, dust control and suppression during operation.

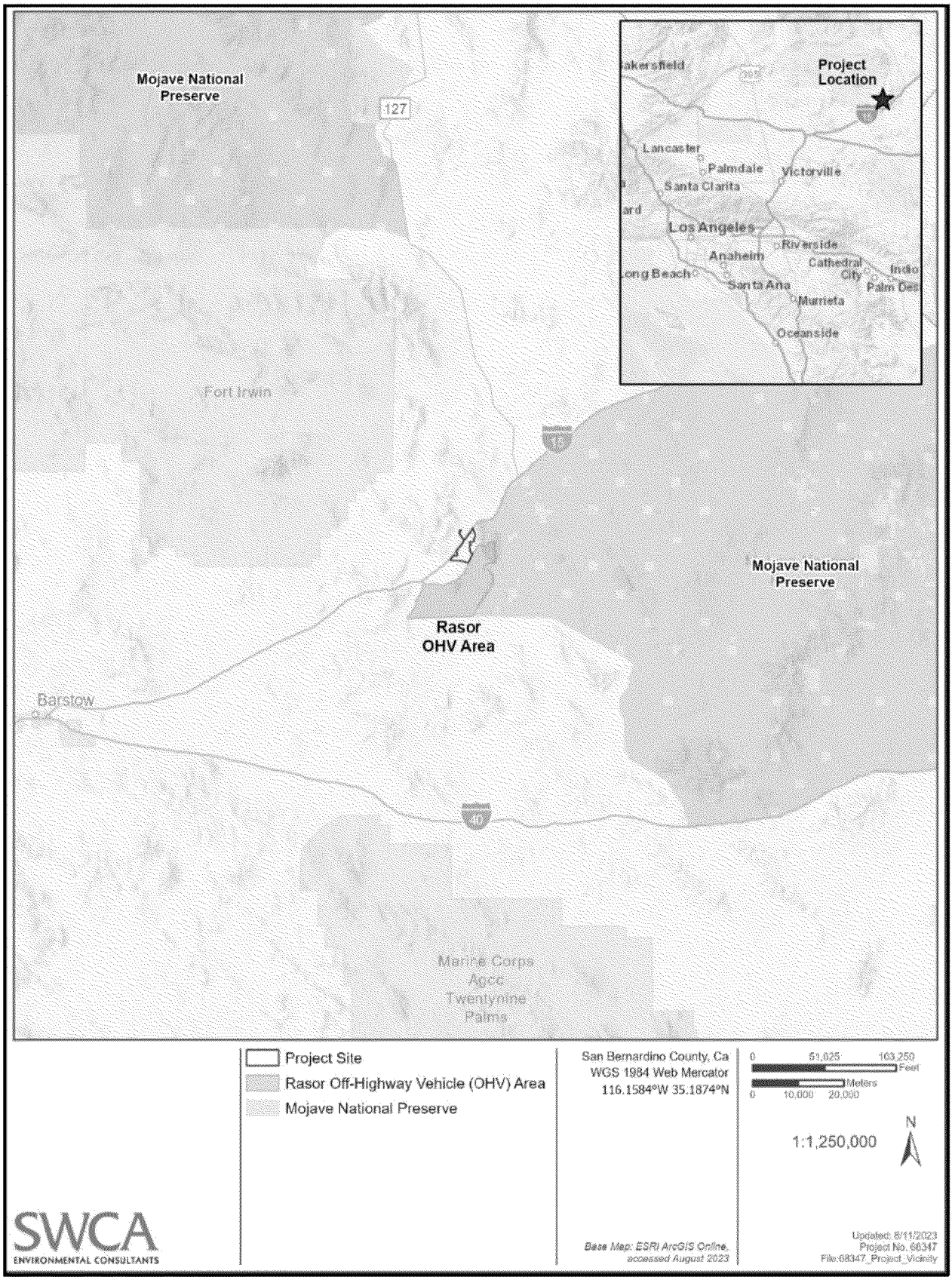


Figure 1. Project site vicinity.

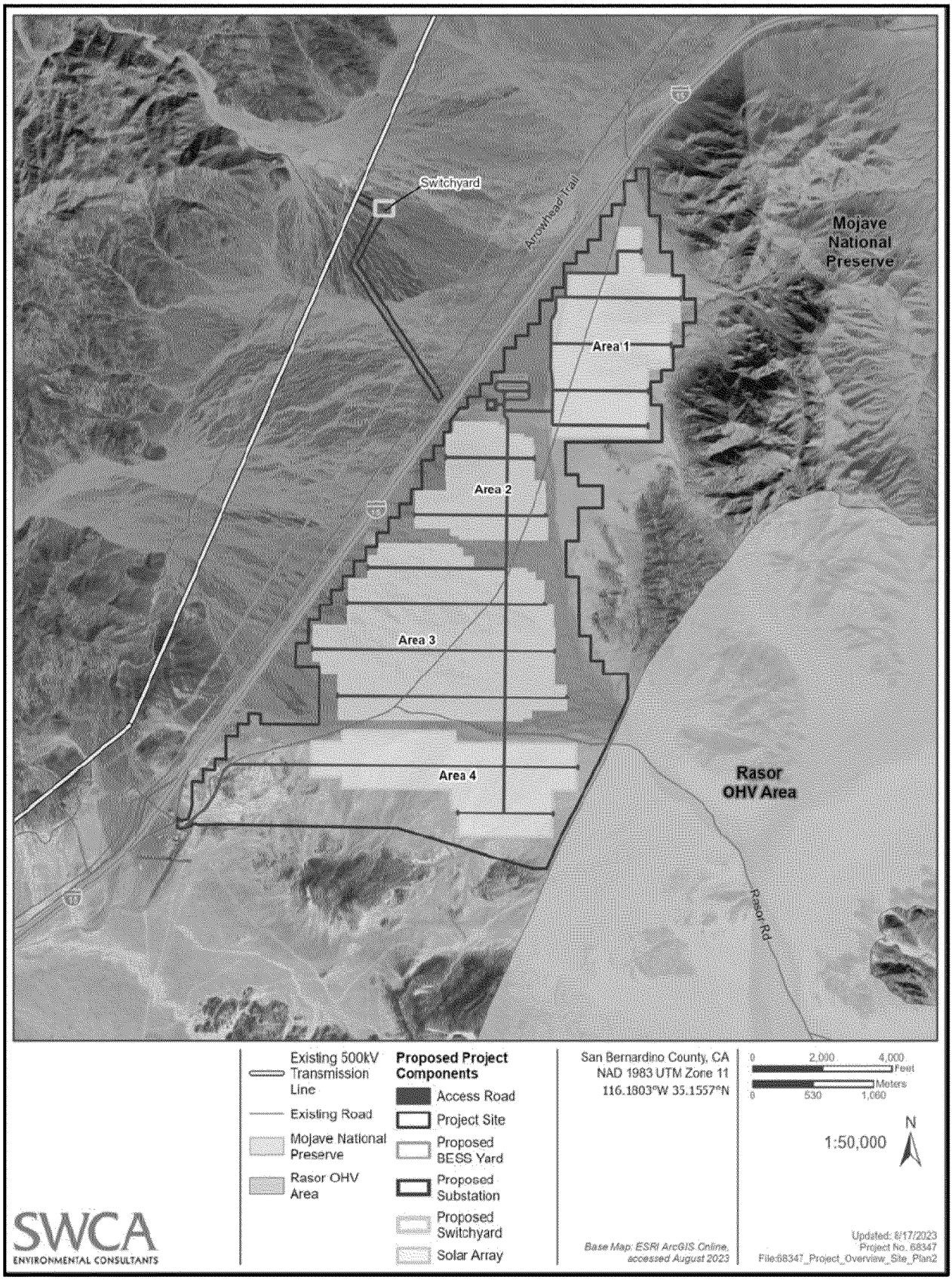


Figure 2. Site plan.

2.3 Construction Time Frame and Phasing

Construction of the project, from mobilization to the site to final completion, is expected to occur over an approximately 18-month period, assumed to occur from March 2026 until the end of August 2027.[1] The project would be constructed in four stages: 1) site preparation and grading (including mobilization, site preparation, grading, fencing, preparation of roads and laydown areas, and installation of measures in the Stormwater Pollution Prevention Plan (SWPPP) as well as erosion control features); 2) structural construction (including the installation of solar array structural components including piles, racking systems, and foundations); 3) solar array installation (including installation of solar and BESS inverters, solar panels, battery storage systems, and ancillary equipment, and would also include trenching activities to install cables and other electrical equipment); and 4) inspections, testing, and commissioning. Stage 1 would be from months 1 to 8, Stage 2 would be from months 4 to 12, Stage 3 would occur during months 10 to 16, and Stage 4 would occur during months 15 to 18. The typical construction work schedule is expected to be from 6:00 a.m. to 6:00 p.m., Monday through Friday.

All construction activities, including construction staging of equipment, would be situated entirely within the project site, and access to the site will be from a north-bound exit off I-15 via a gated entrance off Rasor Road. Typical construction equipment would be used during all phases of project construction; would be stored within the staging area; and would potentially include air compressors, backhoes, cranes, a drill rig, loaders, trenchers, and water trucks. Grading of up to 2,112 acres and other types of ground treatment would be conducted outside of existing major drainage channels and would not involve substantial changes to site topography. Once construction is complete, the topography beneath the solar panels would generally be the same as the baseline condition except in areas where soil has been compacted or rocks and isolated surface undulations have been removed by grading. Native vegetation would be allowed to reestablish naturally and would be trimmed during operation as necessary. Grubbing and grading would be required across a majority of the site to level rough or undulating areas of the site and to prepare soils for concrete foundations for substation equipment, inverters, BESS, and the operation and maintenance buildings. Grubbing would involve the removal of vegetation from the construction site, while grading would include earthwork to achieve a certain base or slope. There would be approximately 630,000 cubic yards of cut and 180,100 cubic yards of fill, thus requiring approximately 449,900 cubic yards of export. Construction would generate solid waste. All waste generated during construction would be stored in wind-proof and wildlife-proof containers that periodically would be transported to an off-site disposal facility authorized to accept the waste.

Construction of the solar arrays would begin with the installation of array support posts. Once the support structures are in place, solar panels would be attached to the support frame. The assembled groups of solar panels would be wired together into strings through connectors on the back of the modules. Assembled panel sections then would be connected to combiner boxes located throughout the arrays that would deliver power to the inverter. Output wires from combiner boxes would be routed along an underground trench system, approximately 3 to 4 feet deep and 1 to 3 feet wide, to the inverters and transformer pads. Inverters would be mounted on concrete pads or driven piles. Inverters and transformers would be brought in by tractor-trailers through the Rasor Road site entrance and delivered directly to the mounting pad sites. Construction of the project substation, switchyard, and interconnection to the Mead-Adelanto 500-kV transmission line would occur concurrently with the construction of the solar arrays.

[1] The analysis assumes a construction start date of March 2025, which represents the earliest date construction would initiate. Assuming the earliest start date for construction represents the conservative-case scenario for criteria air pollutant emissions because equipment and vehicle emission factors for later years would be slightly less due to more stringent standards for in-use off-road equipment and heavy-duty trucks, as well as fleet turnover replacing older equipment and vehicles in later years.

Buried electrical lines for DC array wiring and AC wiring between inverters and transformers would then be installed using trenching machines.

As described in Section 7 below, the applicant would develop a Dust Control Plan (DCP) that describes all applicable dust control measures to address construction-related dust (MDAQMD 2020). Dust control measures would include watering roads twice per day and enforcing a maximum speed limit of 15 miles per hour on unpaved roads. Water would be needed primarily for dust control and soil compaction during the first 90 days of grading activities, with small amounts used for sanitary and other purposes. During Stage 1 and Stage 2 of construction, which includes the 90-day grading period, the project would require approximately 200,000 gpd, or approximately 336 acre-feet per year. Water requirements in the second year of construction are expected to be less than 110 acre-feet per year, or half of the requirement of the first year of construction. Five temporary water tanks of 100,000 gallons each would be brought on-site by truck to store water in anticipation of construction water needs. The tanks would be housed on trailers located along access roads or within areas that have been cleared for installation of project components. The tanks may be moved around the site as construction progresses and would be used to fill on-site water trucks. Water used for construction would be supplied by a private groundwater well in Baker, San Bernardino County. The water storage tanks would be removed after construction. According to the project's transportation analysis, there would be a maximum of 600 one-way worker trips and 234 one-way haul truck trips (200 heavy duty and 34 water trucks) per day for project construction (Appendix A).

3 ENVIRONMENTAL SETTING

The project is located in unincorporated San Bernardino County within the MDAB, which encompasses a 21,000-square-mile area that includes the majority of San Bernardino County, the eastern portion of Kern County, the eastern portion of Riverside County, and the northeastern portion of Los Angeles County. The MDAB is composed of four California air districts: MDAQMD, the Antelope Valley Air Quality Management District, the Eastern Kern Air Pollution Control District, and the eastern portion of the South Coast Air Quality Management District (SCAQMD). MDAQMD has jurisdiction within the San Bernardino County portion of MDAB. The ambient concentrations of air pollutants are determined by the amount of emissions released by the sources of air pollutants and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as topography, meteorology, and climate, in addition to the emissions released by existing air pollutant sources.

3.1 Overview of Air Pollution and Potential Health Effects

3.1.1 Criteria Air Pollutants

Both the federal and state governments have established ambient air quality standards for outdoor concentrations of specific pollutants in order to protect public health and welfare. These pollutants are referred to as "criteria air pollutants," and the national and state standards have been set at levels considered safe to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly, with a margin of safety; and to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

Certain air pollutants have been recognized to cause notable health problems and consequential damage to the environment, either directly or in reaction with other pollutants due to their presence in elevated concentrations in the atmosphere. Such pollutants have been identified and regulated as part of the overall

endeavor to prevent further deterioration and facilitate improvement in the air quality with the MDAB. The criteria air pollutants for which national and state standards have been promulgated and which are most relevant to current air quality planning and regulation in the MDAB and MDAQMD include carbon monoxide (CO), ozone (O_3), particulate matter, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead, sulfates, and hydrogen sulfide (H_2S). These pollutants, as well as volatile organic compounds (VOCs) and toxic air contaminants (TACs), are discussed in the following paragraphs. The national and state criteria pollutants and the applicable ambient air quality standards are listed in Table 1.

3.1.1.1 OZONE

O_3 is a strong-smelling, pale blue, reactive, toxic chemical gas consisting of three oxygen atoms. It is a secondary pollutant formed in the atmosphere by a photochemical process involving the sun's energy and O_3 precursors. These precursors are mainly oxides of nitrogen (NO_x) and VOCs. The maximum effects of precursor emissions on O_3 concentrations usually occur several hours after they are emitted and many miles from the source. Meteorology and terrain play major roles in O_3 formation, and ideal conditions occur during summer and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 exists in the upper atmosphere O_3 layer (stratospheric ozone) and at the Earth's surface in the troposphere (ozone). The O_3 regulated by the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) as a criteria air pollutant is produced close to the ground level, where people live, exercise, and breathe. Ground-level O_3 is a harmful air pollutant that causes numerous adverse health effects and is thus considered "bad" O_3. Stratospheric, or "good" O_3 occurs naturally in the upper atmosphere, where it reduces the amount of ultraviolet light (i.e., solar radiation) entering the Earth's atmosphere. Without the protection of the beneficial stratospheric O_3 layer, plant and animal life would be seriously harmed.

O_3 in the troposphere causes numerous adverse health effects; short-term exposures (lasting for a few hours) can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes (EPA 2022a). These health problems are particularly acute in sensitive receptors such as the sick, the elderly, and young children.

3.1.1.2 NITROGEN DIOXIDE

NO_2 is a brownish, highly reactive gas that is present in all urban atmospheres. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide (N_2O), which is a colorless, odorless gas. NO_x plays a major role, together with VOCs, in the atmospheric reactions that produce O_3. NO_x is formed from fuel combustion under high temperature or pressure. In addition, NO_x is an important precursor to acid rain and may affect both terrestrial and aquatic ecosystems. The two major emissions sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers.

NO_2 can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections (EPA 2022a).

3.1.1.3 CARBON MONOXIDE

CO is a colorless, odorless gas formed by the incomplete combustion of hydrocarbon, or fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas automobile exhaust accounts for the majority of CO emissions. CO is a nonreactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions—primarily wind speed, topography, and atmospheric stability. CO from

motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, which is a typical situation at dusk in urban areas from November to February. The highest levels of CO typically occur during the colder months of the year, when inversion conditions are more frequent.

In terms of adverse health effects, CO competes with oxygen, often replacing it in the blood, reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can include dizziness, fatigue, and impairment of central nervous system functions (EPA 2022a).

3.1.1.4 SULFUR DIOXIDE

SO_2 is a colorless, pungent gas formed primarily from incomplete combustion of sulfur-containing fossil fuels. The main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels.

SO_2 is an irritant gas that attacks the throat and lungs and can cause acute respiratory symptoms and diminished ventilator function in children. When combined with particulate matter, SO_2 can injure lung tissue and reduce visibility and the level of sunlight. SO_2 can also yellow plant leaves and erode iron and steel (EPA 2022a).

3.1.1.5 PARTICULATE MATTER

Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. Particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) and particulate matter less than 10 microns in diameter (PM_{10}) represent fractions of particulate matter. Coarse particulate matter (PM_{10}) is 10 microns or less in diameter and is about $^1/_7$ the thickness of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush and waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. Fine particulate matter ($PM_{2.5}$) is 2.5 microns or less in diameter and is roughly $^1/_{28}$ the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g., from motor vehicles and power generation and industrial facilities), residential fireplaces, and woodstoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur oxides (SO_x), NO_x, and VOCs.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances such as lead, sulfates, and nitrates can cause lung damage directly or be absorbed into the bloodstream, causing damage elsewhere in the body. Additionally, these substances can transport adsorbed gases such as chlorides or ammonium into the lungs, also causing injury. Whereas PM_{10} tends to collect in the upper portion of the respiratory system, $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissue. Suspended particulates also damage and discolor surfaces on which they settle and produce haze and reduce regional visibility.

People with influenza, people with chronic respiratory and cardiovascular diseases, and the elderly may suffer worsening illness and premature death as a result of breathing particulate matter. People with

bronchitis can expect aggravated symptoms from breathing in particulate matter. Children may experience a decline in lung function due to breathing in $PM_{2.5}$ and PM_{10} (EPA 2022a).

3.1.1.6 LEAD

Lead in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline; the manufacturing of batteries, paints, ink, ceramics, and ammunition; and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phaseout of leaded gasoline reduced the overall inventory of airborne lead by nearly 95%. With the phaseout of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emissions sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance, including intelligence quotient (IQ) performance, psychomotor performance, reaction time, and growth. Children are highly susceptible to the effects of lead (EPA 2022a).

3.1.1.7 OTHERS

Sulfates. Sulfates are the fully oxidized form of sulfur, which typically occur in combination with metals or hydrogen ions. Sulfates are produced from reactions of SO_2 in the atmosphere. Sulfates can result in respiratory impairment, as well as reduced visibility.

Vinyl Chloride. Vinyl chloride is a colorless gas with a mild, sweet odor, which has been detected near landfills, sewage plants, and hazardous waste sites, due to the microbial breakdown of chlorinated solvents. Short-term exposure to high levels of vinyl chloride in air can cause nervous system effects, such as dizziness, drowsiness, and headaches. Long-term exposure through inhalation can cause liver damage, including liver cancer.

Hydrogen Sulfide. H_2S is a colorless and flammable gas that has a characteristic odor of rotten eggs. Sources of H_2S include geothermal power plants, petroleum refineries, sewers, and sewage treatment plants. Exposure to H_2S can result in nuisance odors, as well as headaches and breathing difficulties at higher concentrations.

3.1.2 Volatile Organic Compounds

VOCs are typically formed from combustion of fuels and/or released through evaporation of organic liquids. Some VOCs are also classified by the state of California as TACs. Although there are no specific VOC ambient air quality standards, VOC is a prime component (along with NO_x) of the photochemical processes by which such criteria pollutants as O_3, NO_2, and certain fine particles are formed. They are, thus, regulated as "precursors" to the formation of those criteria pollutants.

3.1.3 Toxic Air Contaminants

TACs refer to a diverse group of "non-criteria" air pollutants that can affect human health but have not had ambient air quality standards established for them. This is not because they are fundamentally different from the pollutants discussed above but because their effects tend to be local rather than regional. TACs are identified by federal and state agencies based on a review of available scientific evidence. In the state of California, TACs are identified through a two-step process that was established in

1983 under the Toxic Air Contaminant Identification and Control Act. This two-step process of risk identification and risk management and reduction was designed to protect residents from the health effects of toxic substances in the air. In addition, the California Air Toxics "Hot Spots" Information and Assessment Act, Assembly Bill (AB) 2588, was enacted by the state legislature in 1987 to address public concern over the release of TACs into the atmosphere. The law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hot spots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years.

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

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

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

CARB has adopted and implemented a number of regulations to reduce emissions of DPM from stationary and mobile sources. Several of these regulatory programs affect medium- and heavy-duty diesel trucks that represent the bulk of DPM emissions from California highways. These regulations include the solid waste collection vehicle rule, in-use public and utility fleets, and the heavy-duty diesel truck and bus regulations. In 2008, CARB approved a new regulation to reduce emissions of DPM and NO_x from existing on-road, heavy-duty, diesel-fueled vehicles, including those used at construction sites. The regulation requires affected vehicles to meet specific performance requirements between 2014 and 2023, with all affected diesel vehicles required to have 2010 model-year engines or equivalent by 2023. Therefore, as of January 1, 2023, all trucks and buses are 2010 or newer model year engines.

Naturally occurring asbestos areas are identified based on the type of rock found in the area. Asbestos-containing rocks found in California are ultramafic rocks, including serpentine rocks. Asbestos has been designated a TAC by CARB and is a known carcinogen. When this material is disturbed in connection with construction, grading, quarrying, or surface mining operations, asbestos containing dust can be generated. Exposure to asbestos can result in adverse health effects such as lung cancer, mesothelioma (cancer of the linings of the lungs and abdomen), and asbestosis (scarring of lung tissues that results in constricted breathing) (Van Gosen and Clinkenbeard 2011).

Naturally occurring asbestos is prevalent in at least 44 of California's 58 counties. Asbestos is the name for a group of naturally occurring silicate minerals. Asbestos may be found in serpentine, other ultramafic, and volcanic rock. When rock containing naturally occurring asbestos is broken or crushed, asbestos may become released and become airborne, causing a potential health hazard. To reduce exposure to asbestos when these soils are disturbed, CARB adopted the Airborne Toxic Control Measure for Construction, Grading, Quarrying and Surface Mining Operations. This statewide regulation is applicable to grading or any other projects disturbing soil in areas of California where asbestos may exist, as determined by the California Geological Survey. The Airborne Toxic Control Measure applies to any size construction project, although there are additional notification requirements for projects that exceed 1 acre. The project is not located in a geologic setting with a potential for asbestos to occur; therefore, asbestos will not be an issue for this project (CARB 2000a).

Table 1. State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards	
			Primary	Secondary
Ozone (O_3)	1 hour	0.09 ppm (180 µg/m³)	–	Same as Primary
	8 hour	0.070 ppm (137 µg/m³)	0.070 ppm (137µg/m³)	
Respirable particulate matter (PM_{10})	24 hour	50 µg/m³	150 µg/m³	Same as Primary
	Annual mean	20 µg/m³	–	
Fine particulatematter ($PM_{2.5}$)	24 hour	–	35 µg/m³	Same as Primary
	Annual mean	12 µg/m³	9.0 µg/m³	15 µg/m³
Carbon monoxide (CO)	1 hour	20 ppm (23 µg/m³)	35 ppm (40 mg/m³)	–
	8 hour	9.0 ppm (10 mg/m³)	9 ppm (10 mg/m³)	–
Nitrogen dioxide(NO_2)	1 hour	0.18 ppm (339 µg/m³)	100 ppb (188 µg/m³)	–
	Annual mean	0.030 ppm (57 µg/m³)	0.053 ppm (100 µg/m³)	Same as Primary
Sulfur dioxide (SO_2)	1 hour	0.25 ppm (655 µg/m³)	75 ppb (196 µg/m³)	–
	3 hour	–	–	0.5 ppm (1,300 µg/m³)
	24 hour	0.04 ppm (105 µg/m³)	0.14 ppm	–
	Annual mean	–	0.030 ppm	–
Lead	30-day average	1.5 µg/m³	–	–
	Calendarquarter	–	1.5 µg/m³	Same as Primary
	Rolling 3-month average	–	0.15 µg/m³	Same as Primary
Visibility-reducing particles	8 hour	10-mile visibility standard, extinction of 0.23 per kilometer	No National Standards	
Sulfates	24 hour	25 µg/m³		
Hydrogen sulfide (H_2S)	1 hour	0.03 ppm (42 µg/m³)		

Vinyl chloride	24 hour	0.01 ppm (265 µg/m³)

Source: CARB (2016).
Notes: ppm = parts per million; ppb = parts per billion; µg/m³ = micrograms per cubic meter; – = no standard.
National annual PM2.5 primary standard is currently being proposed to be reduced to 9–10 µg/m3.

3.1.4 Odors

A qualitative assessment should be made as to whether a project has the potential to generate odorous emissions of a type or quantity that could meet the statutory definition for nuisance, i.e., odors "which cause detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which may endanger the comfort, repose, health, or safety of any such person or the public, or which may cause, or have a natural tendency to cause, injury or damage to business or property" (Health and Safety Code 41700). Although offensive odors usually do not cause any physical harm, they can be unpleasant enough to lead to considerable distress among the public and generate citizen complaints to local governments and MDAQMD. MDAQMD's Rule 402 (Nuisance) also prohibits any person or source from emitting air contaminants that cause injury, detriment, nuisance, or annoyance to a considerable number of persons or 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. This rule does not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

3.2 Existing Air Quality Conditions at the Project Site

3.2.1 Regional Air Quality

CARB divides the state into air basins that share similar meteorological and topographical features. The MDAB includes the desert portion of San Bernardino County and the eastern portion of Riverside County. The MDAB is an assemblage of mountain ranges interspersed with long broad valleys that often contain dry lakes. Many of the lower mountains that dot the vast terrain rise from 1,000 to 4,000 feet above the valley floor. Prevailing winds in the MDAB are out of the west and southwest. These prevailing winds are due to the proximity of the MDAB to coastal and central regions and the blocking nature of the Sierra Nevada to the north; air masses pushed onshore in Southern California by differential heating are channeled through the MDAB. The MDAB is separated from the Southern California Coastal and Central California valley regions by mountains (highest elevation approximately 10,000 feet), whose passes form the main channels for these air masses. The Antelope Valley is bordered in the northwest by the Tehachapi Mountains, separated from the Sierra Nevadas in the north by the Tehachapi Pass (3,800 feet in elevation). The Antelope Valley is bordered in the south by the San Gabriel Mountains, bisected by Soledad Canyon (3,300 feet).

The Mojave Desert is bordered in the southwest by the San Bernardino Mountains, separated from the San Gabriel Mountains by the Cajon Pass (4,200 feet). A lesser channel lies between the San Bernardino Mountains and the Little San Bernardino Mountains (the Morongo Valley).

The Palo Verde Valley portion of the Mojave Desert lies in the low desert, at the eastern end of a series of valleys (notably the Coachella Valley) whose primary channel is the San Gorgonio Pass (2,300 feet) between the San Bernardino and San Jacinto Mountains.

During the summer, the MDAB is generally influenced by a Pacific subtropical high cell that sits off the coast, inhibiting cloud formation and encouraging daytime solar heating. The MDAB is rarely influenced by cold air masses moving south from Canada and Alaska, as these frontal systems are weak and diffuse

prior to reaching the desert. Most desert moisture arrives from infrequent warm, moist, and unstable air masses from the south. The MDAB averages between 3 and 7 inches of precipitation per year (from 16 to 30 days with at least 0.01 inch of precipitation). The MDAB is classified as a dry-hot desert climate (BWh), with portions classified as dry-very hot desert (BWhh), to indicate at least 3 months have maximum average temperatures over 100.4° F.

The MDAB experiences changes with the seasons including in the winter freezing temperatures, strong winds and precipitation in the form of snow primarily above 5,000 feet in elevation, and rain below 5,000 feet. Most precipitation occurs between November and April. During summer, brief, high-intensity thunderstorms may occur suddenly and can cause high winds and localized flash flooding.

The local meteorology of the project site and surrounding area is represented by measurements recorded at the National Climatic Data Center (NCDC) Baker Station meteorological station. The normal annual precipitation is approximately 4.48 inches. December temperatures range from a normal minimum of 34.2°F to a normal maximum of 47.6°F. July temperatures range from a normal minimum of 78.2°F to a normal maximum of 109.2°F (NCDC 2023). The prevailing wind direction is from the west-southwest (Western Regional Climate Center 2002).

3.2.2 Regional Attainment Status

Depending on whether the applicable ambient air quality standards are met or exceeded, MDAQMD is classified on a federal and state level as being in "attainment" or "nonattainment." EPA and CARB determine the air quality attainment status of designated areas by comparing ambient air quality measurements from state and local ambient air monitoring stations with the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS). These designations are determined on a pollutant-by-pollutant basis. Consistent with federal requirements, an unclassifiable or unclassified designation is treated as an attainment designation. The project region is designated as a nonattainment area for the federal and state O_3, nonattainment for federal and state PM_{10}, and nonattainment for state $PM_{2.5}$ standards. Therefore, as shown in Table 2, the region is considered an "attainment/unclassified" area for all other pollutants (EPA 2023a). Thus, the General Conformity Rule, which is designed to protect ambient air quality within nonattainment and maintenance areas against further degradation applies and the de minimis thresholds are outlined in 40 CFR 93.153(b)(1).

Table 2. Federal and State Ambient Air Quality Attainment Status

Pollutant	Federal	State
O_3	Nonattainment	Nonattainment
NO_2	Unclassified/Attainment	Attainment
CO	Attainment	Attainment
SO_2	Unclassified/Attainment	Attainment
PM_{10}	Nonattainment	Nonattainment
$PM_{2.5}$	Unclassified/Attainment	Nonattainment

Source: EPA 2023a

3.2.3 Local Air Quality

Air pollutant emissions are generated in the local vicinity by mobile sources primarily consisting of automobile traffic. Area-wide sources are the primary source of pollutants in the local vicinity.

3.2.3.1 EXISTING CRITERIA POLLUTANT LEVELS AT NEARBY MONITORING STATIONS

Existing levels of ambient air quality and historical trends and projections in the vicinity of the project site have been documented and measured at six air quality monitoring stations throughout the MDAQMD area. MDAQMD and CARB monitors and collects information 24 hours per day, 7 days per week on ambient levels of pollutants. The nearest stations with meteorological conditions representative of the project site are the Trona, California, Station (Trona - Athol/Telescope #2), the Barstow, California, Station, the Ridgecrest – Ward, California, Station, and the Fontana, California, Station which monitor O_3, NO_2, SO_2, CO, PM_{10}, and $PM_{2.5}$. Data from these monitoring stations are summarized in Table 3 and Table 4. The data show violations of the state PM_{10} standard and federal and state O_3. The high desert's proximity to South Coast Air Basin and the prevailing southwest winds that transport pollutants from more congested urban areas south of the Cajon Pass into the region causes concern over ground-level O_3 impacting ambient air. Violations of the federal O_3 standard occur several times each summer, as do violations of the state standard for particulate matter (PM_{10}), usually in the fall and winter.

Table 5 and Table 6 shows the data from the Ridgecrest – Ward monitoring station and the Fontana, California, Station, which is not considered as representative as the Trona and Barstow monitoring station as these have similar complexity of the terrain and surrounding land use. This air quality data collected by CARB include exceptional events, including wind and wildfires. The GHG inventory for California for years 2016 through 2020 is presented in Table 7. The national and state criteria pollutants and the applicable ambient air quality standards are listed above in Table 1.

Table 3. Summary of Ambient Air Quality Monitoring Summary – Trona Monitoring Station

Criteria Pollutant		Year		
		2021	2022	2023
O_3	Maximum 1-hour concentration (ppm)	0.094	0.099	0.075
	Days exceeding CAAQS (0.09 ppm)	0	1	0
	Maximum 8-hour concentration (ppm)	0.078	0.084	0.070
	Days exceeding NAAQS (0.07 ppm)	5	1	0
	Days exceeding CAAQS (0.07 ppm)	5	1	0
PM10	Maximum 24-hour concentration (µg/m^3)	184.1	357.6	97.3
	Days exceeding NAAQS (150 µg/m^3)	2	2	0
	Days exceeding CAAQS (50 µg/m^3)	*	*	*
NOx	Maximum 1-hour concentration (ppb)	43.6	41.1	43.0
	Days exceeding NAAQS (100 ppb)	0	0	0
	Days exceeding CAAQS (180 ppb)	0	0	0
	Maximum Annual concentration (ppb)	3	3	3
	Days exceeding NAAQS (53 ppb)	0	0	0
	Days exceeding CAAQS (30 ppb)	0	0	0

Source: CARB (2023a).

Notes: ppm = parts per million; µg/m^3 = micrograms per cubic meter.

*Insufficient data

Data for O_3, NO_2, and PM_{10} were obtained from the CARB Trona - Athol/Telescope #2 Monitoring Station.

Table 4. Summary of Ambient Air Quality Monitoring Summary – Barstow Monitoring Station

Criteria Pollutant		Year		
		2021	2022	2023
O_3	Maximum 1-hour concentration (ppm)	0.099	0.095	0.085
	Days exceeding CAAQS (0.09 ppm)	2	1	0
	Maximum 8-hour concentration (ppm)	0.087	0.084	0.077
	Days exceeding NAAQS (0.07 ppm)	20	13	16
	Days exceeding CAAQS (0.07 ppm)	20	13	16
PM10	Maximum 24-hour concentration (µg/m^3)	372.7	225.1	318.7
	Days exceeding NAAQS (150 µg/m^3)	1	6	3
	Days exceeding CAAQS (50 µg/m^3)	*	*	*
NOx	Maximum 1-hour concentration (ppb)	62.4	59.8	60.3
	Days exceeding NAAQS (100 ppb)	0	0	0
	Days exceeding CAAQS (180 ppb)	0	0	0
	Maximum Annual concentration (ppb)	14	14	13
	Days exceeding NAAQS (53 ppb)	0	0	0
	Days exceeding CAAQS (30 ppb)	0	0	0

Source: CARB (2023a).
Notes: ppm = parts per million; µg/m^3 = micrograms per cubic meter.
*Insufficient data
Data for O_3, NO_2, and PM_{10} were obtained from the CARB Barstow Monitoring Station.

Table 5. Summary of Ambient Air Quality Monitoring Summary - Ridgecrest – Ward Monitoring Station

Criteria Pollutant		Year		
		2021	2022	2023
PM10	Maximum 24-hour concentration (µg/m^3)	285.6	416.8	176.5
	Days exceeding NAAQS (150 µg/m^3)	3	2	1
	Days exceeding CAAQS (50 µg/m^3)	25	11	4
PM2.5	Maximum 24-hour concentration (µg/m^3)	178.0	32.3	13.3
	Days exceeding NAAQS (35 µg/m^3)	12	0	0
	Maximum Annual concentration (µg/m^3)	8.3	4.0	4.5
	Days exceeding NAAQS (9 µg/m^3)	0	0	0

Source: CARB (2023a).
Notes: ppm = parts per million; µg/m^3 = micrograms per cubic meter.
Data for PM_{10} and $PM_{2.5}$ were obtained from the CARB Ridgecrest – Ward Monitoring Station.

Table 6. Summary of Ambient Air Quality Monitoring Summary - Fontana Monitoring Station

Criteria Pollutant		Year		
		2021	2022	2023
SO2	Maximum 1-hour concentration (ppb)	5.0	2.7	3.3
	Days exceeding NAAQS (75 ppb)	0	0	0
	Maximum 24-hour concentration (ppb)	0.24	0.46	0.22

Criteria Pollutant		Year		
		2021	2022	2023
	Days exceeding NAAQS (140 µg/m^3)	0	0	0
CO	Maximum 1-hour concentration (ppm)	1.9	1.6	1.5
	Days exceeding NAAQS (35 ppm)	0	0	0
	Maximum 8-hour concentration ppm)	1.4	1.0	1.0
	Days exceeding NAAQS (9 ppm)	0	0	0

Source: CARB (2023a).
Notes: ppm = parts per million; µg/m^3 = micrograms per cubic meter.
Data for SO_2 and CO were obtained from the CARB Fontana Monitoring Station.

Table 7. California Greenhouse Gas Inventory

Parameter	Unit*	Year				
		2018	2019	2020	2021	2022
Transportation	MMT CO_2e	164.8	161.7	135.2	145.1	139.9
	Percentage	40.2%	40.1%	36.7%	38.2%	37.7%
Electric power	MMT CO_2e	65.0	60.2	59.5	62.3	59.8
	Percentage	15.8%	14.9%	16.1%	16.4%	16.1%
Industrial	MMT CO_2e	82.3	80.9	73.6	74.2	72.7
	Percentage	20.0%	20.0%	20.0%	19.5%	19.6%
Commercial and residential	MMT CO_2e	37.5	40.6	39.0	38.8	39.5
	Percentage	9.1%	10.1%	10.6%	10.2%	10.6%
Agriculture	MMT CO_2e	32.0	31.2	31.4	30.4	29.8
	Percentage	7.8%	7.7%	8.5%	8.0%	8.0%
Recycling and Waste	MMT CO_2e	20.6	20.8	21.3	21.3	21.3
	Percentage	5.0%	5.1%	5.8%	5.6%	5.7%
High global warming potential (GWP)	MMT CO_2e	8.2	8.3	8.5	8.3	8.2
	Percentage	2.0%	2.0%	2.3%	2.2%	2.2%
Total Net Emissions	MMT CO_2e	**410.5**	**403.7**	**368.5**	**380.4**	**371.1**

Source: California GHG Inventory for 2000–2022 (CARB 2024).
* MMT CO2e = million metric tons carbon dioxide equivalent.

3.2.3.2 EXISTING HEALTH RISK IN THE PROJECT VICINITY

OEHHA, on behalf of the California Environmental Protection Agency (CalEPA), provides a screening tool called CalEnviroScreen that can be used to help identify California communities disproportionately burdened by multiple sources of pollution. The project is located in Census Tract 6071010300, which has 3,547 people. To determine the existing level of TACs in the area, the CalEnviroScreen indicator that represents modeled air concentration of chemical releases from large facility emissions in and nearby the census tract was identified. This indicator takes the air concentration and toxicity of the chemical to determine the toxic release score. The data are averaged over 2017 to 2019, and the toxic release indicator scores range from 0 to 96,985. The score for this census tract is 0.13, which means the toxic release percentile for this census tract is 3, or higher than 3% of the census tracts in California (OEHHA 2021).

The CalEnviroScreen for DPM was determined, as DPM is also a TAC. This indicator represents how much DPM is emitted into the air within and near the populated parts of the census tracts. The data from 2016 indicate that sources of DPM within and nearby the populated parts of this census tract emit 0.009 tons per year. The DPM percentile for this census tract is 4, meaning it is higher than 4% of the census tracts in California. Diesel emissions in California counties range between 0 and 15 tons per year. These indicators show that health risk in the project vicinity is low for DPM and toxic releases. Similarly, for O_3, the indicator is the mean of summer months (May–October) of the daily maximum 8-hour O_3 concentration (parts per million [ppm]). This measurement is used to represent short-term O_3 health impacts. The census tract has a summed concentration of 0.058 ppm. O_3 concentrations in California range between 0.03 and 0.07 ppm. Overall, according to CalEnviroScreen, the project is located in the 77th percentile for O_3, which means the project site has levels of O_3 that are higher than 77% of the census tracts in California (OEHHA 2021). Overall, according to CalEnviroScreen, the project is located in the 75th percentile, which means that the project site is higher than average in comparison to other communities within California (OEHHA 2021).

3.2.3.3 SENSITIVE USES

Some population groups, including children, elderly, and acutely and chronically ill persons (especially those with cardiorespiratory diseases), are considered more sensitive to air pollution than others. A sensitive receptor is a person in the population who is particularly susceptible to health effects due to exposure to an air contaminant. The following are land uses where sensitive receptors are typically located:

- Schools, playgrounds, and childcare centers
- Long-term health care facilities
- Rehabilitation centers
- Convalescent centers
- Hospitals
- Retirement homes
- Residences

The project site is composed of rural desert land and is almost entirely undeveloped. There is the nearby Mojave National Preserve (administered by the National Park Service) and BLM-managed lands, including the Rasor OHV recreation area at the southeast corner. I-15, the former Arrowhead Trail Highway, runs along the western boundary of the project site, with Rasor Road Services Shell Oil gas station located off I-15 southwest of the project site, along the access road to the project site. The nearest schools, Baker Elementary, Middle, and High Schools, are over 6.5 miles away, situated in the northeastern part of Baker. The closest residences to the project location can be found next to the Rasor Road service station, roughly 260 feet southwest of the proposed boundary. This area encompasses a stand-alone house and accommodation for four workers. There are no other sensitive receptors within 1,500 feet of the project site and actual construction occurs more than 3,500 feet from this stand-alone home. Implementation of the proposed project would not result in the long-term operation of any emission sources that would adversely affect nearby sensitive receptors. Short-term (18 months) construction activities could result in temporary increases in pollutant concentrations.

3.3 Greenhouse Gas Setting

Global climate change refers to the changes in average climatic conditions on Earth as a whole, including changes in temperature, wind patterns, precipitation, and storms. Global warming, a related concept, is the observed increase in the average temperature of the Earth's atmosphere and oceans in recent decades. There is a general scientific consensus that global climate change is occurring, caused in whole or in part by increased emissions of GHGs that keep the Earth's surface warm by trapping heat in the Earth's atmosphere, in much the same way as glass traps heat in a greenhouse. The Earth's climate is changing because human activities, primarily the combustion of fossil fuels, are altering the chemical composition of the atmosphere through the buildup of GHGs. GHGs are released by the combustion of fossil fuels, land clearing, agriculture, and other activities, and lead to an increase in the greenhouse effect. Although climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to GHG emissions reduction and climate change research and policy.

Regarding the adverse effects of global warming, as reported by AB 2538: "Global warming poses a serious threat to the economic well-being, public health, natural resources and the environment of California." Over the past few decades, the energy intensity of the national and state economy has been declining due to the shift to a more service-oriented economy. California ranked fifth lowest among the states in carbon dioxide (CO_2) emissions from fossil fuel consumption per unit of gross state product. However, in terms of total CO_2 emissions, California is second only to Texas in the nation and is the 16th largest source of climate change emissions in the world, exceeding most nations.

3.3.1 Greenhouse Gas Background

GHGs include CO_2, methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Carbon is the most abundant GHG. Other GHGs are less abundant but have higher global warming potential (GWP) than CO_2. Thus, emissions of other GHGs are frequently expressed in the equivalent mass of CO_2, denoted as carbon dioxide equivalent (CO_2e). Forest fires, decomposition, industrial processes, landfills, and consumption of fossil fuels for power generation, transportation, heating, and cooking are the primary sources of GHG emissions. The primary GHGs attributed to global climate change are described below.

3.3.1.1 CARBON DIOXIDE

In the atmosphere, carbon generally exists in its oxidized form, as CO_2. Natural sources of CO_2 include the respiration (breathing) of humans, animals, and plants; volcanic outgassing; decomposition of organic matter; and evaporation from the oceans. Anthropogenic sources of CO_2 include the combustion of fossil fuels and wood, waste incineration, mineral production, and deforestation. Anthropogenic sources of CO_2 amount to over 30 billion tons per year, globally (Friedlingstein et al. 2022). Natural sources release substantially larger amounts of CO_2. However, natural removal processes, such as photosynthesis by land- and ocean-dwelling plant species, cannot keep pace with this extra input of human-made CO_2. Consequently, the gas is building up in the atmosphere.

3.3.1.1.1 Methane

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

3.3.1.1.2 Nitrous Oxide

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

3.3.1.1.3 Hydrofluorocarbons, Perfluorocarbons, Sulfur Hexafluoride

HFCs are used primarily as substitutes for O_3-depleting substances regulated under the Montreal Protocol (1987), an international treaty that was approved on January 1, 1989, and was designated to protect the O_3 layer by phasing out the production of several groups of halogenated hydrocarbons believed to be responsible for O_3 depletion. PFCs and SF_6 are emitted from various industrial processes, including aluminum smelting, semiconductor manufacturing, electric power transmission and distribution, and magnesium casting. There is no primary aluminum or magnesium production in California; however, the rapid growth in the semiconductor industry leads to greater use of PFCs.

The use of SF_6 in electric utility systems and switchgear, including circuit breakers, poses a concern because this pollutant has an extremely high GWP (one pound of SF_6 is the equivalent warming potential of approximately 24,600 pounds of CO_2) (IPCC 2021a).[2] SF_6 is inert and non-toxic, and is encapsulated in circuit breaker assemblies. SF_6 is a GHG with substantial global warming potential because of its chemical nature and long residency time within the atmosphere. However, under normal conditions, it would be completely contained in the equipment and SF_6 would only be released in the unlikely event of a failure, leak, or crack in the circuit breaker housing. New circuit breaker designs have been developed over the past several years to minimize the potential for leakage, compared to that of past designs.

The magnitude of the impact on global warming differs among the GHGs. The effect each GHG has on climate change is measured as a combination of the volume of its emissions and its GWP. GWPs are one type of simplified index based upon radiative properties used to estimate the potential future impacts of emissions of different gases upon the climate system, expressed as a function of how much warming would be caused by the same mass of CO_2. Thus, GHG emissions are typically measured in terms of pounds or tons of CO_2e. GWP are based on a number of factors, including the radiative efficiency (heat-absorbing ability) of each gas relative to that of CO_2, as well as the decay rate of each gas (the amount removed from the atmosphere over a given number of years) relative to that of CO_2. The larger GWP, the more that a given gas warms the Earth compared to CO_2 over that time period. HFCs, PFCs, and SF_6 have a greater GWP than CO_2. In other words, these other GHGs have a greater contribution to global warming than CO_2 on a per-mass basis. However, CO_2 has the greatest impact on global warming because of the relatively large quantities of CO_2 emitted into the atmosphere.

A summary of the atmospheric lifetime and GWP of selected gases is presented in Table 8. As indicated in this table, GWPs range from 1 to 23,500 based on IPCC assessment reports. IPCC has released three assessment reports (AR4, AR5, and AR6) with updated GWPs; however, CARB reports the statewide GHG inventory using the AR4 GWPs, which is consistent with international reporting standards. By applying the GWP ratios, project-related equivalent mass of CO_2, denoted as CO_2e emissions can be tabulated in metric tons per year.

[2] A global warming potential of 23,900 was used to convert emissions to CO_2e. This value is based on the global warming potential in the USEPA Mandatory Reporting Program Regulations (40 Code of Federal Regulations Part 98, Subpart A), and deviates from the use of GWPs from the IPCC 6th Assessment Report which was used for the conversion of CH_4 and N_2O.

Table 8. Global Warming Potentials

Greenhouse Gas	GWP Values for 100-year Time Horizon		
	AR4*	AR5	AR6
Carbon dioxide (CO_2)	1	1	1
Methane (CH_4)	25	28	Fossil origin – 29.8 Non-fossil origin – 27.2
Nitrous oxide (N_2O)	298	265	273
Select hydrofluorocarbons (HFCs)	124–14,800	4–12,400	–
Sulfur hexafluoride (SF_6)	22,800	23,500	24,600

Sources: IPCC (2007, 2013, 2021b).

* For consistency with EPA and its Inventory of Greenhouse Gas Reporting, we have represented values from AR4 of the IPCC report in this report.

3.3.2 Greenhouse Gas Emissions Inventories

3.3.2.1 U.S. GREENHOUSE GAS EMISSIONS

Per the EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2022* (EPA 2024), In 2022, total gross U.S. greenhouse gas emissions were 6,343.2 million metric tons of CO_2e. Total gross U.S. emissions decreased by 3.0% from 1990 to 2022, down from a high of 15.2% above 1990 levels in 2007. Gross emissions increased from 2021 to 2022 by 0.2% (14.4 MMT CO_2e). Net emissions (including sinks) were 5,489.0 MMT CO_2 Eq. in 2022. Overall, net emissions increased by 1.3 percent from 2021 to 2022 and decreased by 16.7% from 2005 levels. Between 2021 and 2022, the increase in total greenhouse gas emissions was driven largely by an increase in CO_2 emissions from fossil fuel combustion across most end-use sectors due in part to increased energy use from the continued rebound of economic activity after the height of the COVID-19 pandemic. In 2022, CO_2 emissions from fossil fuel combustion increased by 1.0 percent relative to the previous year and were 1.1 percent below emissions in 1990. Carbon dioxide emissions from natural gas use increased by 5.2% (84.8 MMT CO_2e.) from 2021, while CO_2 emissions from coal consumption decreased by 6.1% (58.6 MMT CO_2e.) from 2021 to 2022. The increase in natural gas consumption and associated emissions in 2022 is observed across all sectors except U.S. Territories, while the coal decrease is due to reduced use in the electric power sector. Emissions from petroleum use also increased by 0.9% (19.0 MMT CO_2e.) from 2021 to 2022.

3.3.2.2 STATEWIDE GHG EMISSIONS

According to California's 2000–2022 GHG emissions inventory, California emitted 371.1 MMT CO_2e in 2022 (CARB 2024). The sources of GHG emissions in California include transportation, industrial uses, electric power production from both in-state and out-of-state sources, commercial and residential uses, agriculture, high global-warming potential substances, and recycling and waste. The California GHG emission source categories (as defined in CARB's 2008 Scoping Plan [CARB 2009]) and their relative contributions in 2022 are presented in Table 7. Total GHG emissions in 2022 were approximately 42.9 MMT CO_2e less than 2016 emissions. The 2016 statewide GHG inventory fell below 1990 levels, consistent with AB 32. The declining trend in GHG emissions, coupled with programs that will continue to provide additional GHG reductions going forward, demonstrates that California will continue to reduce emissions below the 2020 target of 431 MMTCO_2e (CARB 2024) and toward the 2050 target (80% below 1990 levels by 2050 [consistent with Executive Order S-3-05]). The California GHG inventory for 2018 through 2022 is presented in Table 7.

4 REGULATORY SETTING

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

4.1 Federal

4.1.1 Federal Clean Air Act

4.1.1.1 AIR QUALITY

The federal Clean Air Act (CAA), which was passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The CAA delegates primary responsibility for clean air to EPA. The EPA develops rules and regulations to preserve and improve air quality and delegates specific responsibilities to state and local agencies. Under the act, EPA has established the NAAQS for six criteria air pollutants that are pervasive in urban environments and for which state and national health based ambient air quality standards have been established. O_3, CO, NO_2, SO_2, lead, and particulate matter (PM_{10} and $PM_{2.5}$) are the six criteria air pollutants. O_3 is a secondary pollutant; NO_x and VOCs are of particular interest as they are precursors to O_3 formation. The NAAQS are divided into primary and secondary standards; the primary standards are set to protect human health within an adequate margin of safety, and the secondary standards are set to protect environmental values, such as plant and animal life. The standards for all criteria pollutants are presented in Table 1.

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

4.1.1.2 GREENHOUSE GAS EMISSIONS

The Supreme Court of the United States (SCOTUS) ruled in Massachusetts v. Environmental Protection Agency, 127 S.Ct. 1438 (2007), that CO_2 and other GHGs are pollutants under the federal CAA, which EPA must regulate if it determines they pose an endangerment to public health or welfare. SCOTUS did not mandate that EPA enact regulations to reduce GHG emissions. Instead, SCOTUS found that EPA could avoid taking action if it found that GHGs do not contribute to climate change or if it offered a "reasonable explanation" for not determining that GHGs contribute to climate change.

On April 17, 2009, EPA issued a proposed finding that GHGs contribute to air pollution that may endanger public health or welfare. On April 24, 2009, the proposed rule was published in the *Federal Register* under Docket ID No. EPA-HQ-OAR-2009-0171. The EPA stated that high atmospheric levels of GHGs "are the unambiguous result of human emissions and are very likely the cause of the observed increase in average temperatures and other climatic changes." The EPA further found that "atmospheric concentrations of greenhouse gases endanger public health and welfare within the meaning of Section 202 of the Clean Air Act." The findings were signed by the EPA Administrator on December 7, 2009. The final findings were published in the *Federal Register* on December 15, 2009. The final rule was effective on January 14, 2010. Although these findings alone do not impose any requirements on industry or other entities, this action is a prerequisite to regulatory actions by EPA, including, but not limited to, GHG emissions standards for light-duty vehicles.

On July 20, 2011, EPA published its final rule deferring GHG permitting requirements for CO_2 emissions from biomass-fired and other biogenic sources until July 21, 2014. Environmental groups challenged the deferral. In September 2011, EPA released *Accounting Framework for Biogenic CO_2 Emissions from Stationary Sources*, which analyzes accounting methodologies and suggests implementation for biogenic CO_2 emitted from stationary sources (EPA 2011).

On April 4, 2012, EPA published a proposed rule to establish, for the first time, a new source performance standard for GHG emissions. Under the proposed rule, new fossil fuel–fired generating units larger than 25 MW are required to limit emissions to 1,000 pounds of CO_2 per megawatt-hour on an average annual basis, subject to certain exceptions.

On April 17, 2022, EPA issued emission rules for oil production and natural gas production and processing operations, which are required by the CAA under 40 Code of Federal Regulations Parts 60 and 63. The final rules include the first federal air standards for natural gas wells that are hydraulically fractured, along with requirements for several other sources of pollution in the oil and gas industry that currently are not regulated at the federal level.

4.1.2 Toxic Substance Control Act

The Toxic Substances Control Act (TSCA) provides EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures. TSCA became law on October 11, 1976, and it became effective on January 1, 1977. The TSCA authorized EPA to secure information on all new and existing chemical substances, as well as to control any of the substances that were determined to cause unreasonable risk to public health or the environment. Congress later added additional titles to the TSCA, with this original part designated at Title I – Control of Hazardous Substances. TSCA regulatory authority and program implementation rests predominantly with the federal government (i.e., EPA). However, EPA can authorize states to operate their own, EPA-authorized programs for some portions of the statute. TSCA Title IV allows states the flexibility to develop accreditation and certification programs and work practice standards for lead-related inspection, risk assessment, renovation, and abatement that are at least as protective as existing federal standards.

4.1.3 National Emission Standards for Hazardous Air Pollutants (Asbestos)

The EPA's air toxics regulation for asbestos is intended to minimize the release of asbestos fibers during activities involving the handling of asbestos. Asbestos was one of the first hazardous air pollutants regulated under the air toxics program, as there are major health effects associated with asbestos exposure (lung cancer, mesothelioma, and asbestosis). On March 31, 1971, EPA identified asbestos as a hazardous pollutant, and on April 6, 1973, EPA promulgated the Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP), currently found in 40 Code of Federal Regulations Part 61(M). The Asbestos NESHAP has been amended several times, most comprehensively in November 1990. In 1995, the rule was amended to correct cross-reference citations to Occupational Safety and Health Administration, Department of Transportation, and other EPA rules governing asbestos. Air toxics regulations under the CAA have guidance on reducing asbestos in renovation and demolition of buildings; institutional, commercial, and industrial buildings; large-scale residential demolition; exceptions to the asbestos removal requirements; asbestos control methods; waste disposal and transportation; and milling, manufacturing, and fabrication.

4.2 State

4.2.1 California Clean Air Act

The California Clean Air Act (CCAA) was adopted by CARB in 1988. The CCAA requires that all air districts in the state endeavor to achieve and maintain CAAQS for O_3, CO, SO_2, and NO_2 by the earliest practical date. The CCAA specifies that districts focus particular attention on reducing the emissions from transportation and area-wide emission sources, and the CCAA provides districts with authority to regulate indirect sources. CARB and local air districts are responsible for achieving CAAQS, which are to be achieved through district-level Air Quality Management Plans (AQMPs) that would be incorporated into the SIP. In California, EPA has delegated authority to prepare SIPs to CARB, which in turn, has delegated that authority to individual air districts. Each district plan is required to either 1) achieve a 5% annual reduction, averaged over consecutive 3-year periods, in districtwide emissions of each nonattainment pollutant or its precursors, or 2) to provide for implementation of all feasible measures to reduce emissions. Any planning effort for air quality attainment would thus need to consider both state and federal planning requirements.

The State of California began to set its ambient air quality standards (i.e., CAAQS) in 1969, under the mandate of the Mulford-Carrell Act. The CCAA requires all air districts of the state to achieve and maintain the CAAQS by the earliest practical date. Table 1 shows the CAAQS currently in effect for each of the criteria pollutants, as well as the other pollutants recognized by the state. As shown in Table 1, the CAAQS are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, H_2S, vinyl chloride, and visibility-reducing particles.

California has also adopted a host of other regulations that reduce criteria pollutant emissions, including the following:

- Title 20 California Code of Regulations (CCR): Appliance Energy Efficiency Standards
- Title 24, Part 6, CCR: Building Energy Efficiency Standards
- Title 24, Part 11, CCR: Green Building Standards Code

The project buildings will comply with any applicable requirements including the requirements for insulation, nonresidential indoor lighting standards, mandatory lighting controls, mechanical (HVAC) requirements, and hot water requirements. In addition, solar PV panels will be mounted to the roof of the O&M buildings.

4.2.2 California Code of Regulations

The CCR is the official compilation and publication of regulations adopted, amended, or repealed by the state agencies pursuant to the Administrative Procedure Act. The CCR includes regulations that pertain to air quality emissions. Specifically, 13 CCR 2485 states that the idling of all diesel-fueled commercial vehicles (weighing over 10,000 pounds) during construction shall be limited to 5 minutes at any location. In addition, 17 CCR 93115 states that operation of any stationary, diesel-fueled, compression-ignition engine shall meet specified fuel and fuel additive requirements and emission standards.

4.2.3 Toxic Air Contaminants Regulations

California regulates TACs primarily through the Toxic Air Contaminant Identification and Control Act of 1983 (AB 1807, also known as the Tanner Air Toxics Act) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588 – Connelly). In the early 1980s, CARB established a statewide

comprehensive air toxics program to reduce exposure to air toxics. The Tanner Air Toxics Act (AB 1807) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) supplements the AB 1807 program by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks (CARB 2011).

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

Under AB 2588, TAC emissions from individual facilities are quantified and prioritized by the air quality management district or air pollution control district. High-priority facilities are required to perform a health risk assessment and, if specific thresholds are exceeded, to communicate the results to the public through notices and public meetings.

CARB has promulgated the following specific rules to limit TAC emissions:

- 13 CCR Chapter 10, Section 2485, Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling
- 13 CCR Chapter 10, Section 2480, Airborne Toxic Control Measure to Limit School Bus Idling and Idling at Schools
- 13 CCR Section 2477 and Article 8, Airborne Toxic Control Measure for In-Use Diesel-Fueled TRUs and TRU Generator Sets and Facilities Where TRUs Operate

The proposed project would be required to comply with the applicable diesel control measures.

4.2.4 Executive Order S-3-05, Executive Order B-30-15, and Executive Order B-55-18

In 2005, the governor issued Executive Order (EO) S-3-05, establishing statewide GHG emissions reduction targets, as well as a process to ensure the targets are met. The order directed the Secretary of the CalEPA to report every 2 years on the state's progress toward meeting the governor's GHG emission reduction targets. The statewide GHG targets established by EO S-3-05 are as follows:

- By 2010, reduce to 2000 emission levels.
- By 2020, reduce to 1990 emission levels.
- By 2050, reduce to 80% below 1990 levels.

EO B-30-15, issued by Governor Brown in April 2015, established an additional statewide policy goal to reduce GHG emissions 40% below their 1990 levels by 2030. Reducing GHG emissions by 40% below 1990 levels in 2030 and by 80% below 1990 levels by 2050 (consistent with EO S-3-05) aligns with

scientifically established levels needed in the United States to limit global warming below 2 degrees Celsius.

The state legislature adopted equivalent 2020 and 2030 statewide targets in the California Global Warming Solutions Act of 2006 (also known as AB 32) and Senate Bill (SB) 32, respectively, both of which are discussed below. However, the legislature has not yet adopted a target for the 2050 horizon year. As a result of EO S-3-05, the California Action Team (CAT), led by the Secretary of CalEPA, was formed. The CAT is made of representatives from a number of state agencies and was formed to implement global warming emission reduction programs and to report on the progress made toward meeting statewide targets established under the EO. The CAT reported several recommendations and strategies for reducing GHG emissions and reaching the targets established in the EO.

The CAT stated that "smart" land use is an umbrella term for strategies that integrate transportation and land use decisions. Such strategies generally encourage jobs and housing proximity, promote transit-oriented development, and encourage high-density residential and commercial development along transit corridors. These strategies develop more efficient land use patterns within each jurisdiction or region to match population increases, workforce, and socioeconomic needs for the full spectrum of the population. "Intelligent transportation systems" is the application of advanced technology systems and management strategies to improve operational efficiency of transportation systems and the movement of people, goods, and service.

EO B-55-18, issued by Governor Brown in September 2018, establishes a new statewide goal to achieve carbon neutrality as soon as possible, but no later than 2045, and achieve and maintain net negative emissions thereafter. Based on this EO, CARB would work with relevant state agencies to develop a framework for implementation and accounting that tracks progress toward this goal, as well as ensuring future scoping plans identify and recommend measures to achieve the carbon neutrality goal.

4.2.5 Assembly Bill 32 – California Global Warming Solution Act

The California Global Warming Solutions Act of 2006 (also known as AB 32) commits the State to achieving the following:

- By 2010, reduce to 2000 GHG emission levels.
- By 2020, reduce to 1990 levels.

To achieve these goals, which are consistent with the California CAT GHG targets for 2010 and 2020, AB 32 mandates that CARB establish a quantified emissions cap; institute a schedule to meet the cap; implement regulations to reduce statewide GHG emissions from stationary sources consistent with the CAT strategies; and develop tracking, reporting, and enforcement mechanisms to ensure that reductions are achieved. In order to achieve the reductions, AB 32 requires CARB to adopt rules and regulations in an open, public process that achieves the maximum technologically feasible and cost-effective GHG reductions.

SB 32, signed on September 8, 2016, updates AB 32 to include an emissions reduction goal for the year 2030. Specifically, SB 32 requires CARB to ensure that statewide GHG emissions are reduced to 40% below the 1990 level by 2030. The new plan, outlined in SB 32, involves increasing renewable energy use, imposing tighter limits on the carbon content of gasoline and diesel fuel, putting more electric cars on the road, improving energy efficiency, and curbing emissions from key industries.

4.2.6 Climate Change Scoping Plan

In 2008, CARB approved a Climate Change Scoping Plan, as required by AB 32. Subsequently, CARB approved updates of the Climate Change Scoping Plan in 2014 (First Update) and 2017 (2017 Update), with the 2017 Update considering SB 32 (adopted in 2016) in addition to AB 32 (CARB 2014, 2017). The First Update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals (to the level of 427 MMT CO_2e) defined in the original Scoping Plan. It also evaluates how to align the state's longer-term GHG reduction strategies with other state policy priorities, such as for water, waste, natural resources, clean energy and transportation, and land use. In November 2022, the final *2022 Scoping Plan Update and Appendices* (2022 Scoping Plan Update) was released. This 2022 Scoping Plan Update assesses progress toward the statutory 2030 target and lays out a path to achieving carbon neutrality no later than 2045 (CARB 2022b). The 2022 Scoping Plan Update focuses on outcomes needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and others, and is designed to meet the state's long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities.

4.2.7 Assembly Bill 197

AB 197, signed on September 8, 2016, is a bill linked to SB 32 that prioritizes efforts to reduce GHG emissions in low-income and minority communities. AB 197 requires CARB to make available, and update at least annually on its website, the emissions of GHGs, criteria pollutants, and TACs for each facility that reports to CARB and air districts. In addition, AB 197 adds two members of the legislature to the CARB board as ex officio, non-voting members, and also creates the Joint Legislative Committee on Climate Change Policies to ascertain facts and make recommendations to the legislature concerning the state's programs, policies, and investments related to climate change.

4.2.8 Cap-and-Trade Program

The 2008 Climate Change Scoping Plan identified a cap-and-trade program as one of the strategies for California to reduce GHG emissions. The cap-and-trade program is a key element in California's climate plan. It sets a statewide limit on sources responsible for 85% of California's GHG emissions and establishes a price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy. The cap-and-trade rules came into effect on January 1, 2013, and they apply to large electric power plants and large industrial plants. In 2015, fuel distributors, including distributors of heating and transportation fuels, also became subject to the cap-and-trade rules. At that stage, the program will encompass approximately 360 businesses throughout California and nearly 85% of the state's total GHG emissions. Covered entities subject to the cap-and-trade program are sources that emit more than 25,000 metric tons CO_2e per year. Triggering of the 25,000 metric tons CO_2e per year "inclusion threshold" is measured against a subset of emissions reported and verified under the California Regulation for the Mandatory Reporting of Greenhouse Gas Emissions.

Under the cap-and-trade regulation, companies must hold enough emission allowances to cover their emissions and are free to buy and sell allowances on the open market. California held its first auction of GHG allowances on November 14, 2012. California's GHG cap-and-trade system has reduced GHG emissions to 1990 levels by the year 2020 and would achieve an approximate 80% reduction from 1990 levels by 2050.

4.2.9 Senate Bill 1078 (California Renewables Portfolio Standard)

SB 1078 established California's Renewable Portfolio Standard (RPS) program in 2002. The RPS program requires electrical corporations and electric service providers to purchase a specified minimum percentage of electricity generated by eligible renewable energy resources. The bill requires the California Energy Commission (CEC) to certify eligible renewable energy resources, to design and implement an accounting system to verify compliance with the RPS by retail sellers, and to allocate and award supplemental energy payments to cover above-market costs of renewable energy. Under SB 1078, each electrical corporation was required to increase its total procurement of eligible renewable energy resources by at least 1% per year so that 20% of its retail sales were procured from eligible renewable energy resources.

In 2006, SB 107 accelerated the RPS program by establishing a deadline of December 31, 2010, for achieving the goal of having 20% of total electricity sold to retail customers in California per year generated from eligible renewable energy resources.

The RPS goal was increased to 33% when Governor Schwarzenegger signed EO S-14-08 in November 2008. EO S-14-08 was later superseded by EO S-21-09 on September 15, 2009. EO S-21-09 directed CARB to adopt regulations requiring 33% of electricity sold in the state to come from renewable energy by 2020. This EO was superseded by Statute SB X1-2 in 2011, which modified the California RPS program to require that both public- and investor-owned utilities in California receive at least 33% of their electricity from renewable sources by the year 2020. SB 2X also requires regulated sellers of electricity to meet an interim milestone of procuring 25% of their energy supply from certified renewable sources by 2016.

4.2.10 Senate Bill 350

SB 350, signed on October 7, 2015, is the Clean Energy and Pollution Reduction Act of 2015. The objectives of SB 350 are 1) to increase the procurement of electricity from renewable sources from 33% to 50% by the end of 2030; and 2) to double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation.

4.2.11 Senate Bill 100

SB 100, signed on September 10, 2018, is the 100 Percent Clean Energy Act of 2018. SB 100 updates the goals of California's RPS and SB 350, as discussed above, to the following: achieve a 50% renewable resources target by December 31, 2026; and achieve a 60% target by December 31, 2030. SB 100 also requires that eligible renewable energy resources and zero-carbon resources supply 100% of retail sales of electricity to California end-use customers and 100% procured to serve all state agencies by December 31, 2045.

4.2.12 Senate Bill 1368

SB 1368, signed on September 29, 2006, is a companion bill to AB 32, which requires the California Public Utilities Commission and the CEC to establish GHG emission performance standards for the generation of electricity. These standards also generally apply to power that is generated outside of California and imported into the state. SB 1368 provides a mechanism for reducing the emissions from electricity providers, thereby assisting CARB to meet its mandate under AB 32. On January 25, 2007, the California Public Utilities Commission adopted an interim GHG emissions performance standard, which is a facility-based emission standard requiring that all new long-term commitments for baseload generation to serve California customers be with power plants that have GHG emissions no greater than

a combined-cycle gas turbine plant. That level is established at 1,100 pounds of CO_2 per megawatt-hour. Furthermore, on May 23, 2007, the CEC adopted regulations that establish and implement an identical emissions performance standard of 1,100 pounds of CO_2 per megawatt-hour.

4.2.13 Assembly Bill 1493 (Pavley I)

AB 1493, passed in 2002, requires the development and adoption of regulations to achieve the maximum feasible reduction in GHGs emitted by noncommercial passenger vehicles, light-duty trucks, and other vehicles used primarily for personal transportation in the state. CARB originally approved regulations to reduce GHGs from passenger vehicles in September 2004, which took effect in 2009. On September 24, 2009, CARB adopted amendments to these regulations that reduce GHG emissions and new passenger vehicles from 2009 through 2016. Although setting emission standards on automobiles is solely the responsibility of EPA, the federal CAA allows California to set state-specific emission standards on automobiles, and the state first obtains a waiver from EPA. EPA granted California that waiver until July 1, 2009. The comparison between the AB 1493 standards and the federal Corporate Average Fuel Economy standards was completed by CARB, and the analysis determined that the California emission standards were 16% more stringent through the 2016 model year and 18% more stringent for the 2020 model year. CARB is also committed to further strengthening these standards beginning with 2020 model year vehicles, to obtain a 45% GHG reduction in comparison to 2009 model years.

In March 2020, EPA issued the Safer Affordable Fuel-Efficient Vehicles Rule, which would roll back fuel economy standards and revoke California's waiver. Under this rule, EPA would amend certain average fuel economy and GHG standards for passenger cars covering model years 2021 through 2026. In September 2019, EPA withdrew the waiver it had previously provided in California for the state's GHG and Zero Emission Vehicle (ZEV) programs under Section 209 of the CAA. The withdrawal of the waiver went into effect on November 26, 2019. In response, several states, including California, have filed a lawsuit challenging the withdrawal of the EPA waiver. These actions continue to be challenged in court. As noted above, on January 20, 2021, President Biden issued an EO directing all executive departments and agencies to take action, as appropriate, to address federal regulations and other actions taken during the last 4 years that conflict with the administration's climate and environmental justice goals, which include the Safer Affordable Fuel-Efficient Vehicles Rule.

4.2.14 California Code of Regulations Section 95350 et seq.

In 2010, CARB adopted the Regulation for Reducing Sulfur Hexafluoride Emissions From Gas Insulated Switchgear (Section 17 CCR Section 95350 et seq.). The purpose of this regulation is to achieve GHG emission reductions by reducing SF_6 emissions from gas-insulated switchgear. Owners of such switchgear must not exceed maximum allowable annual emissions rates, reduced each year until 2020, after which annual emissions must not exceed 1 percent. Owners must regularly inventory gas insulated switchgear equipment, measure quantities of SF_6, and maintain records of these for at least three years. Additionally, by June 1 each year, owners also must submit an annual report to CARB's Executive Officer for emissions that occurred during the previous calendar year.

In December 2021, CARB adopted amendments to the Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear, to update the phase out of SF_6 in gas-insulated switchgear. The new phase out schedule begins in January 2025 with all switchgear needing to be SF_6 free by January 2033. Under this resolution, CARB has developed a timeline for phasing out SF_6 equipment in California and created incentives to encourage owners to replace SF_6 equipment. The California Office of Administrative Law approved this rulemaking in December 2021 and the Resolution went into effect January 1, 2022.

4.2.15 Executive Order S-01-07 (California Low Carbon Fuel Standard)

EO S-01-07, the Low Carbon Fuel Standard (LCFS) (issued January 18, 2007), requires a reduction of at least 10% in the carbon intensity of California transportation fuels by 2020. Regulatory proceedings and implementation of the LCFS were directed to CARB. CARB released a draft version of the LCFS in October 2008. The final regulation was approved by the Office of Administrative Law and filed with the Secretary of State on January 12, 2010; the LCFS became effective on the same day.

The 2017 Update has identified LCFS as a regulatory measure to reduce GHG emissions to meet the 2030 emissions target. In calculating statewide emissions and targets, the 2017 Update has assumed the LCFS be extended to an 18% reduction in carbon intensity beyond 2020. On September 27, 2018, CARB approved a rulemaking package that amended the LCFS to relax the 2020 carbon intensity reduction from 10% to 7.5%, and to require a carbon intensity reduction of 20% by 2030.

4.2.16 Advanced Clean Car Regulations

In 2012, CARB approved the Advanced Clean Cars program, a new emissions control program for model years 2015 through 2025. The components of the advance clean car standards include the Low-Emission Vehicle regulations that reduce criteria pollutants and GHG emissions from light- and medium-duty vehicles, and the ZEV regulation, which requires manufacturers to produce an increasing number of pure ZEVs, with provisions to also produce plug-in hybrid electric vehicles in the 2018 through 2025 model years period. In March 2017, CARB voted unanimously to continue with the vehicle GHG emission standards and the ZEV programs for cars and light trucks sold in California through 2025.

4.2.17 Senate Bill 375

SB 375 requires CARB to set regional emissions reduction targets for passenger vehicles. The Metropolitan Planning Organization for each region must then develop a Sustainable Communities Strategy (SCS) that integrates transportation, land use, and housing policies to plan how it will achieve the emissions target for its region. If the SCS is unable to achieve the regional GHG emissions reductions targets, the Metropolitan Planning Organization is required to prepare an alternative planning strategy that shows how the GHG emissions reduction target can be achieved through alternative development patterns, infrastructure, and/or transportation measures.

As required under SB 375, CARB is required to update regional GHG emission targets every 8 years, with the last update formally adopted in March 2018. As part of the 2018 update, CARB adopted a passenger vehicle–related GHG reduction target of 19% by 2035 for the Southern California Association of Governments (SCAG) region, which is more stringent than the previous reduction target of 13% for 2035.

4.2.18 Senate Bill 97

SB 97 was enacted in 2007. SB 97 required the Governor's Office of Planning and Research (OPR) to develop, and the California Natural Resources Agency to adopt, amendments to the CEQA Guidelines addressing the analysis and mitigation of GHG emissions (OPR 2008, 2018). Those CEQA Guidelines amendments clarified several points, including the following:

- Lead agencies must analyze the GHG emissions of proposed projects and must reach a conclusion regarding the significance of those emissions.

- When a project's GHG emissions may be significant, lead agencies must consider a range of potential mitigation measures to reduce those emissions.
- Lead agencies must analyze potentially significant impacts associated with placing projects in hazardous locations, including locations potentially affected by climate change.
- Lead agencies may significantly streamline the analysis of GHGs on a project level by using a programmatic GHG emissions reduction plan meeting certain criteria.
- CEQA mandates analysis of a proposed project's potential energy use (including transportation-related energy), sources of energy supply, and ways to reduce energy demand, including through the use of efficient transportation alternatives.

As part of the administrative rulemaking process, the California Natural Resources Agency developed a Final Statement of Reasons explaining the legal and factual bases, intent, and purpose of the CEQA Guidelines amendments. The amendments to the CEQA Guidelines implementing SB 97 became effective on March 18, 2010. SB 97 applies to any environmental impact report, negative declaration, mitigated negative declaration, or other document required by CEQA, which has not been finalized.

4.3 Local

4.3.1 Mojave Desert Air Quality Management District

MDAQMD maintains a set of rules and regulations to improve and maintain healthy air quality for the entire population within its jurisdiction (MDAQMD 2023). When developing new regulations, MDAQMD must comply with complex procedures established by statutes in federal and state codes. The following are some of the rules that would apply to the project:

- *Rule 201 Permit to Construct:* A person shall not build, erect, install, alter or replace any equipment, the use of which may cause the issuance of air contaminants or the use of which may eliminate, reduce or control the issuance of air contaminants without first obtaining written authorization for such construction from the Air Pollution Control Officer. A permit to construct shall remain in effect until the permit to operate the equipment for which the application was filed is granted or denied, or the application is canceled.
- *Rule 203 Permit to Operate:* A person shall not operate or use any equipment, the use of which may cause the issuance of air contaminants or the use of which may reduce or control the issuance of air contaminants, without first obtaining a written permit from the Air Pollution Control Office. The equipment shall not be operated contrary to the conditions specified in the permit to operate.
- *Rule 204 Permit Conditions:* To assure compliance with all applicable regulations, the Air Pollution Control Officer may impose written conditions on any permit. Commencing work or operation under such a permit shall be deemed acceptance of all the conditions so specified.
- *Rule 401 Visible Emissions:* The purpose of the Rule is to provide limits for the visible emissions from sources within the District.
- *Rule 402 Nuisance:* A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

- *Rule 403 Fugitive Dust Control:* The purpose of this rule is to reduce the amount of PM_{10} entrained in the ambient air from anthropogenic Fugitive Dust sources within the District by requiring actions to prevent, reduce, or mitigate Fugitive Dust.
- *Rule 1113 Architectural Coatings*. The purpose of this rule is to limit the quantity of Volatile Organic Compounds (VOC) in Architectural Coatings.

MDAQMD is the local air quality agency and shares responsibility with CARB for ensuring that state and federal ambient air quality standards are achieved and maintained in the MDAB. Furthermore, MDAQMD adopts and enforces controls on stationary sources of air pollutants through its permit and inspection programs and regulates agricultural burning. Other MDAQMD responsibilities include monitoring ambient air quality, preparing clean air plans, planning activities such as modeling and maintenance of the emission inventory, and responding to citizen air quality complaints.

MDAQMD adopted its *California Environmental Quality Act (CEQA) and Federal Conformity Guidelines* in February 2020 (MDAQMD 2020). The MDAQMD CEQA Guidelines provides guidance on how to determine the significance of impacts, including air pollutant emissions, related to the development of residential, commercial, and industrial projects. Where impacts are determined to be significant, the MDAQMD CEQA Guidelines provide guidance to mitigate adverse impacts to air quality from development projects. MDAQMD is the agency principally responsible for comprehensive air pollution control in the region.

Currently, the NAAQS and CAAQS are exceeded in most parts of MDAB. In regard to the NAAQS, the project region within MDAB is in nonattainment for O_3 (8-hour) and PM_{10}. For the CAAQS, the project region within MDAB is in nonattainment for O_3 (1-hour and 8-hour), PM_{10}, and $PM_{2.5}$. In response, MDAQMD has adopted a series of AQMPs to meet the state and federal ambient air quality standards. AQMPs are updated regularly in order to more effectively reduce emissions, accommodate growth, and minimize any negative fiscal impacts of air pollution control on the economy.

MDAQMD has adopted a variety of attainment plans for a variety of nonattainment pollutants. The latest plans include the following:

- 1995 Mojave Desert Planning Area PM_{10} Attainment Plan
- 2004 Southeast Desert Modified Air Quality Maintenance Area Ozone Plan
- 2007 Western Mojave Desert Ozone Attainment Plan
- February 2008 Ozone Early Progress Plans
- 2014 Updates to the 1997 8-Hour Ozone Standard SIPs
- 2015 8-Hour Ozone Reasonable Achievable Control Technology SIP Analysis: MDAQMD
- 2016 8-Hour Ozone SIP
- 2022 8-Hour Ozone SIP

To achieve and maintain ambient air quality standards, MDAQMD has adopted various rules and regulations for the control of airborne pollutants. Those rules applicable to this project include, but are not limited to, MDAQMD Rule 403 Fugitive Dust Control. The purpose of this rule is to reduce the amount of PM_{10} entrained in the ambient air as a result of emissions generated from construction and other earth-moving activities by requiring actions to prevent, reduce, or mitigate PM_{10} emissions. In addition, the project is required to adopt best available control measures to minimize emissions from surface-disturbing activities to comply with MDAQMD Rule 403, detailed in Section 7.3 of this report.

In addition, there are other MDAQMD rules and regulations, not detailed here, that may apply to the project but are administrative or descriptive in nature. These include rules associated with fees, enforcement and penalty actions, and variance procedures.

4.3.2 Southern California Association of Governments

SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties, and addresses regional issues relating to transportation, the economy, community development, and the environment. SCAG coordinates with various air quality and transportation stakeholders in Southern California to ensure compliance with the federal and state air quality requirements, including applicable federal, state, and air district laws and regulations. As the federally designated Metropolitan Planning Organization for the six-county Southern California region, SCAG is required by law to ensure that transportation activities conform to, and are supportive of, the goals of regional and state air quality plans to attain the NAAQS. In addition, SCAG is a co-producer, with SCAQMD, of the transportation strategy and transportation control measure sections of the 2016 AQMP. The development of the 2016 AQMP relies on population and transportation growth projections contained in SCAG's 2016 through 2040 Regional Transportation Plan (RTP)/SCS.

On September 3, 2020, SCAG's Regional Council adopted an updated RTP/SCS known as the 2020–2045 RTP/SCS or Connect SoCal. As with the 2016–2020 RTP/SCS, the purpose of the 2020–2045 RTP/SCS is to meet the mobility needs of the six-county SCAG region over the subject planning period through a roadmap identifying sensible ways to expand transportation options, improve air quality, and bolster Southern California long-term economic viability. On October 30, 2020, CARB accepted SCAG's determination that the SCS met the applicable state GHG emissions targets. The goals and policies of the 2020–2045 RTP/SCS are similar to, and consistent with, those of the 2016–2040 RTP/SCS. In addition, CARB's new target requiring a 19% reduction in per-capita GHG emissions has been included in the 2020–2045 RTP/SCS, to fulfill SB 375 compliance with respect to meeting the state's GHG emission reduction goals.

4.3.3 San Bernardino County Policy Plan

The San Bernardino County Policy Plan (Policy Plan) contains the long-term goals and policies that will guide County decisions, investments, and improvements toward achieving the countywide vision. The Policy Plan represents a unique approach to county planning. It serves as the County's General Plan for the unincorporated areas, which is mandated by state law, but it also includes policy direction for adult and child supportive services, healthcare, public safety, and other regional services the County administers in both incorporated and unincorporated areas. Applicable County Policy Plan components are those that set policies regarding natural resources and renewable energy and conservation. Goal NR-1 Air Quality includes but not limited to encouraging collaboration with air quality management districts and other local agencies to monitor and reduce major pollutants affecting the county at the emission source (Policy NR-1.3), considering recommendations from the California Air Resources Board on the siting of new sensitive land uses and exposure to specific source categories (Policy NR-1.5), encouraging coordination with air quality management districts on requirements for dust control plans, revegetation, and soil compaction to prevent fugitive dust emissions (Policy NR-1.6), focusing on meeting 2040 and 2050 greenhouse gas emission reduction targets in accordance with state law (Policy NR-1.7), and encouraging builders and developers to use low-emission construction vehicles and equipment to improve air quality and reduce emissions (Policy NR-1.8).

The renewable energy and conservation policy goals are to achieve a clean energy future that minimizes negative effects consistent with local values. The County has considered how to reduce energy use through energy efficiency and conservation measures, and identified renewable energy facility standards

that concentrate on community-oriented RE facilities that produce electricity for local consumption through goals like Goal RE-2 Renewable Energy Systems, which strives for the County to be home to diverse and innovative renewable energy systems that provide reliable and affordable energy to the valley, mountain, and desert regions.

4.3.4 County of San Bernardino Regional Greenhouse Gas Reduction Plan

In September 2011, San Bernardino County adopted the County of San Bernardino Greenhouse Gas Emissions Reduction Plan (GHG Plan), which outlines a strategy to use energy more efficiently, harness renewable energy to power buildings, enhance access to sustainable transportation modes, and recycle waste in response to CARB SB 32 Scoping Plan, which charted a path towards the GHG reduction goal using all technologically feasible and cost-effective. In 2021, a new version of the GHG Plan was released and there has been commitment to undertake the following actions that will reduce GHG emissions associated with its regional (or countywide) activities.

- Prepare a baseline (2016) GHG emissions inventory for each of the 25 partnership jurisdictions in the county.
- Prepare future year (2020, 2030, and 2045) GHG emissions forecasts for each of the jurisdictions.
- Develop general GHG reduction measures and jurisdiction-specific measures appropriate for each jurisdiction.
- Develop consistent baseline information for jurisdictions to use for their development of community climate action plans (CAPs) meeting jurisdiction-identified reduction goals.

4.4 California Energy Commission's (CEC) Opt-in Certification Program

In 2022, Assembly Bill 205 established a new Opt-in Certification program for eligible non-fossil-fueled power plants, energy storage, and manufacturing and assembly facilities to optionally seek certification through the CEC. If CEC approves a project, the certification would be in lieu of any permit, certificate, or similar document required by any state, local, or regional agency, or federal agency to the extent permitted by federal law, with some exceptions. The following types of facilities are eligible to apply for Opt-in Certification Program:

- Solar photovoltaic or terrestrial wind electrical generating power plants (50 MW or greater).
- Energy storage system (capable of storing 200 megawatt-hours (MWh) or more).
- A stationary power plant using any source of thermal energy, excluding fossil or nuclear fuels (50 MW or greater).
- Certain transmission lines associated with these generating and storage facilities.
- Specified facilities that manufacture or assemble clean energy or storage technologies or related components.

The project is a solar facility and therefore is eligible if certain requirements are fulfilled. These requirements are outlined in the Appendix B Information Requirements for an Application for Certification (AFC) or Small Power Plant Exemption (SPPE) to support an Application for Certification (AFC) (20 CCR, Div. 2, Ch. 5 App. B). This technical report, which includes additional analysis by Baseline Environmental Consulting as Appendix B, provides the necessary information for the CEC,

focusing on the CEC requirements in Appendix B of the AFC Program Guidance under air sections (g)(8)(A) through (g)(8)(K) and public health sections (g)(9)(A) through (g)(9)(D).

5 THRESHOLDS OF SIGNIFICANCE

5.1 Air Quality

Based on the environmental checklist presented in Appendix G of the State CEQA Guidelines, the project would have a significant impact on air quality if it would:

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

A discussion of applicable thresholds of significance and significance determination follows.

MDAQMD's *CEQA and Federal Conformity Guidelines* was prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the project site (MDAQMD 2020). The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process, consistent with CEQA requirements, and include recommended thresholds of significance, mitigation measures, and background air quality information. MDAQMD's air quality thresholds of significance are tied to achieving or maintaining attainment designations with the NAAQS and CAAQS, which are scientifically substantiated, numerical concentrations of criteria air pollutants considered to be protective of human health. MDAQMD's *CEQA and Federal Conformity Guidelines* (February 2020) indicate that any projects in the MDAB with daily regional emissions that exceed any of the indicated thresholds in Table 9 should be considered as having an individually and cumulatively significant air quality impacts.

Table 9. MDAQMD Air Quality Significance Thresholds

Pollutant	Annual Threshold (short tons)	Daily Threshold (pounds)
Carbon dioxide equivalent (CO_2e)	100,000	<548,000
Nitrogen oxides (NO_x)	25	<137
Volatile organic compounds (VOCs)	25	<137
Particulate matter 10 microns in diameter or smaller (PM_{10})	15	<82
Particulate matter 2.5 microns in diameter of smaller ($PM_{2.5}$)	12	<65
Sulfur oxides (SO_x)	25	<137
Carbon monoxide (CO)	100	<548
Hydrogen sulfide (H_2S)	10	<54
Lead (Pb)	0.6	<3

In any case, regardless of the size of the project, the standard control measures for construction equipment and fugitive PM_{10} must be implemented at all construction sites. Additional measures are required by

MDAQMD Rule 403 for sites with 10 or more acres disturbed, and solar projects in particular. The list of control measures that would be implemented for the project (derived from MDAQMD Rule 403) is provided in Section 7.3 of this report.

Projects that do not exceed the thresholds above would not cumulatively contribute to health effects in the MDAQMD. If projects exceed the thresholds above, emissions would contribute cumulatively to the nonattainment status and would contribute to elevating health effects associated with these criteria air pollutants. Known health effects related to O_3 include worsening of bronchitis, asthma, and emphysema and a decrease in lung function. Health effects associated with particulate matter include premature death of people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, decreased lung function, and increased respiratory symptoms. Reducing emissions would further contribute to reducing possible health effects related to criteria air pollutants.

Impacts related to odors were also assessed qualitatively, based on proposed construction activities, equipment types and duration of use, overall construction schedule, proposed operational activities, and distance to nearby sensitive receptors.

5.1.1 Carbon Monoxide Hotspots

It has long been recognized that CO exceedances are caused by vehicular emissions, primarily when idling at intersections. Concentrations of CO are a direct function of the number of vehicles, length of delay, and traffic flow conditions. Under certain meteorological conditions, CO concentrations close to congested intersections that experience high levels of traffic and elevated background concentrations may reach unhealthy levels, affecting nearby sensitive receptors. Given the high traffic volume potential, areas of high CO concentrations, or "hot spots," are typically associated with intersections that are projected to operate at unacceptable levels of service during the peak commute hours. It has long been recognized that CO hotspots are caused by vehicular emissions, primarily when idling at congested intersections.

However, transport of this criteria pollutant is extremely limited, and CO disperses rapidly with distance from the source under normal meteorological conditions. Furthermore, vehicle emissions standards have become increasingly more stringent in the last 20 years. Currently, the allowable CO emissions standard in California is a maximum of 3.4 grams/mile for passenger cars (requirements for certain vehicles are more stringent). With the turnover of older vehicles, introduction of cleaner fuels, and implementation of increasingly sophisticated and efficient emissions control technologies, CO concentration in the MDAB is designated as in attainment. Detailed modeling of project-specific CO hot spots is not necessary, and thus this potential impact is addressed qualitatively.

A CO hot spot would occur if an exceedance of the state 1-hour standard of 20 ppm or the 8-hour standard of 9 ppm were to occur. The analysis prepared for CO attainment in the SCAQMD 1992 Federal Attainment Plan for Carbon Monoxide in Los Angeles County and a Modeling and Attainment Demonstration prepared by SCAQMD as part of the 2003 AQMP can be used to demonstrate the potential for CO exceedances of these standards. SCAQMD is the air pollution control officer for much of Southern California (SCAQMD 2003a). SCAQMD conducted a CO hot spot analysis as part of the 1992 CO Federal Attainment Plan at four busy intersections in Los Angeles County during the peak morning and afternoon time periods. The intersections evaluated included Long Beach Boulevard and Imperial Highway (Lynwood), Wilshire Boulevard and Veteran Avenue (Westwood), Sunset Boulevard and Highland Avenue (Hollywood), and La Cienega Boulevard and Century Boulevard (Inglewood). The busiest intersection evaluated was at Wilshire Boulevard and Veteran Avenue, which has a traffic volume of approximately 100,000 vehicles per day. Despite this level of traffic, the CO analysis concluded that there was no violation of CO standards (SCAQMD 1992). In order to establish a more accurate record of baseline CO concentrations affecting Los Angeles, a CO "hot spot" analysis was conducted in 2003 at the

same four busy intersections in Los Angeles at the peak morning and afternoon time periods which is the most recent analysis conducted that addresses CO concentrations. This "hot spot" analysis did not predict any violation of CO standards. The highest 1-hour concentration was measured at 4.6 ppm at Wilshire Boulevard and Veteran Avenue, and the highest 8-hour concentration was measured at 8.4 ppm at Long Beach Boulevard and Imperial Highway. Thus, there was no violation of CO standards.

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

The project substation would be uncrewed during operation; however, a workforce of approximately 25 to 40 personnel would visit the substation as needed for maintenance, equipment operation, and/or security. Vehicle access would be infrequent and many days will have no operational related vehicle trips. Thus, the project would not generate traffic volumes at any intersection of more than 100,000 vehicles per day (or 44,000 vehicles per day), and there is no likelihood of the project traffic exceeding CO values.

5.1.2 Toxic Air Contaminants

MDAQMD has not established a quantitative threshold of significance for construction-related TAC emissions and recommends that lead agencies address this issue on a case-by-case basis, taking into consideration the specific construction-related characteristics of each project and its proximity to off-site receptors. Information regarding the project's construction emissions and DPM has been provided in Appendix A and explained in more detail in Section 7.2. Furthermore, implementation of the CEQA rules to limit TAC emissions described in Section 4.2.3 and APM-9 described in Section 7.1, would result in the reduction of DPM exhaust emissions in addition to criteria pollutant emissions, particularly the measures to minimize engine idling time and maintain construction equipment in proper working condition and according to manufacturer's specifications.

5.2 Greenhouse Gases

Consistent with Appendix G of the State CEQA Guidelines, a project would have a significant GHG impact if it would:

- Generate GHG emissions, either directly or indirectly, that may have an adverse effect on the environment; or
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

State CEQA Guidelines Section 15064.4 recommends that lead agencies quantify GHG emissions projects and consider several other factors that may be used in the determination of significance of project-related GHG emissions, including the extent to which the project may increase or reduce GHG emissions, whether the project exceeds an applicable significant threshold, and the extent to which the project complies with the regulations or requirements adopted to implement a reduction or mitigation of GHG.

State CEQA Guidelines Section 15064.4 does not establish a threshold of significance. Lead agencies have the discretion to establish significance thresholds for their respective jurisdictions, and in establishing those thresholds, a lead agency may appropriately look at thresholds developed by other

public agencies, or suggested by other experts, such as the California Air Pollution Control Officers Association (CAPCOA), as long as any threshold chosen is supported by substantial evidence (State CEQA Guidelines Section 15064.7(c)). The State CEQA Guidelines also clarify that the events of GHG emissions are cumulative and should be analyzed in the context of CEQA's requirements for cumulative impact analysis (State CEQA Guidelines Section 15130(f)). It is noted that the State CEQA Guidelines were amended in response to SB 97. In particular, the State CEQA Guidelines were amended to specify that compliance with the GHG emissions reduction plan renders a cumulative impact less than significant.

Per State CEQA Guidelines Section 15064(h)(3), a project's incremental contribution to a cumulative impact can be found not cumulatively considerable if the project would comply with an approved plan or mitigation program that provides specific requirements that would avoid or substantially lessen the cumulative problem within the geographic area of the project. To qualify, such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources through a public review process to implement, interpret, or make specific the law enforced or administered by the public agency. Examples of such programs include "water quality control plan, air quality attainment or maintenance plan, integrated waste management plan, habitat conservation plan, natural community conservation plans [and] plans or regulations for the reduction of greenhouse gas emissions" (14 CCR 15064(h)(3)). Put another way, State CEQA Guidelines Section 15064(h)(3) allows a lead agency to make a finding of less than significant for GHG emissions if a project complies with adopted programs, plans, policies, and/or other regulatory strategies to reduce GHG emissions.

Per State CEQA Guidelines Section 15064.4(b), "in determining the significance of a project's greenhouse gas emissions, the lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project's emissions to the effects of climate change. A project's incremental contribution may be cumulatively considerable even if it appears relatively small compared to statewide, national, or global emissions." When determining the significance of GHG impacts, lead agencies should consider the project's impact compared with the existing environmental setting, whether the project exceeds a threshold of significance, and compliance with relevant GHG-related plans (e.g., State CEQA Guidelines Section 15064.4(b)). Regarding the latter criterion, lead agencies should consider "the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions (e.g., State CEQA Guidelines Section 15183.5(b))." Per State CEQA Guidelines Section 15064.4(b)(3), such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of GHG emissions.

MDAQMD has adopted a threshold of significance for project GHG emissions, which are presented in Table 5. If a project's emissions exceed the thresholds of significance, the project emissions may have a cumulatively considerable contribution to a significant cumulative environmental impact, answering Appendix G of the State CEQA Guidelines first GHG-related question on whether the project would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. The second GHG-related question in Appendix G of the State CEQA Guidelines asks if the project will conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. In order to answer this question, project emissions should be evaluated with respect to consistency with the plans and policies, if applicable, that have been adopted to reduce GHG emissions.

5.3 Displaced Grid Electricity Emissions

Indirect sources of emissions can be of different forms. The project generates electricity from solar energy, a renewable source, and as such, is an indirect source of reduction in fossil fuel-powered electricity generation. The project would provide a renewable energy resource that would displace

generation from higher GHG emitting sources. There would be a small amount of indirect GHG emissions from the project water use. As discussed, periodic washing of the PV modules may be necessary three times per year, and the amount of water needed for this purpose is conservatively estimated at a total of up to 20 acre-feet per year of water would be used for panel washing, dust control and suppression during operation . Other operational emission sources include travel to the site by maintenance workers, operation of the maintenance buildings, and operation of other buildings at the site (energy, water, waste, refrigeration).

The GHG emissions from these operational sources has been determined in the project's California Emission Estimator Model (CalEEMod) operational calculations. The Greenhouse Gas Equivalencies Calculator was used, which uses the AVoided Emissions and geneRation Tool (AVERT) U.S. national weighted average CO_2 marginal emission rate to convert reductions of kilowatt-hours into avoided units of CO_2 emissions (EPA 2025). For a 300-MW solar facility, AVERT calculates that 331,560 tons (300,786 metric tons) per year would be avoided by placing the project into operation.

6 METHODOLOGY

This analysis focuses on the potential change in the air quality environment due to implementation of the project. Air pollution emissions would result from both construction and operation of the project. Specific methodologies used to evaluate these emissions are discussed below.

The analysis is based on project specifics and default values in the latest versions of CalEEMod. Accordingly, this analysis has been conducted with the most recent available tools prepared and accepted by the regulatory agencies. The project's SF_6 consumption has also been estimated.

6.1 Construction Emissions

The project's emissions will be evaluated based on significance thresholds and CEQA guidance established by MDAQMD, as discussed above. Daily emissions during construction are estimated by assuming a conservative construction schedule and applying the multiple source and fugitive dust emission factors derived from MDAQMD-recommended CalEEMod version 2022.1.1.29. Details of the modeling assumptions and emission factors are provided in Appendix A. The calculations of the emissions generated during project construction activities reflect the types and quantities of construction equipment that would be used to complete the project.

6.1.1 Construction Assumptions

Construction emissions associated with the project, including emissions associated with the operation of off-road equipment, haul-truck trips, on-road worker vehicle trips, vehicle travel on paved and unpaved surfaces, and fugitive dust from material handling activities, were calculated using CalEEMod version 2022.1.1.29 (CAPCOA 2023). CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with both construction and operation of a variety of land use projects. The model uses widely accepted federal and state models for emission estimates and default data from sources such as EPA AP-42 emission factors, CARB vehicle emission models, and studies from California agencies such as CEC. The model quantifies direct emissions from construction and operations, as well as indirect emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. The model was developed in collaboration with the air districts in California. Default data (e.g., emission factors, trip

lengths, meteorology, source inventory, etc.) have been provided by the various California air districts to account for local requirements and conditions.

Emissions modeling, including emissions generated during the project, have been grouped into four stages in CalEEMod based on the types of equipment and workload: 1) site preparation and grading (including mobilization, site preparation, grading, fencing, preparation of roads and laydown areas, and installation of measures in the Stormwater Pollution Prevention Plan (SWPPP) as well as erosion control features); 2) structural construction (including the installation of solar array structural components including piles, racking systems, and foundations); 3) solar array installation (including installation of solar and BESS inverters, solar panels, battery storage systems, and ancillary equipment, and would also include trenching activities to install cables and other electrical equipment); and 4) inspections, testing, and commissioning. The project is within a 2,670-acre area with a parking area and several buildings. The following CalEEMod land uses were used to represent the project:

- Industrial - user defined for the 2,670 acres
- 0.33-acre parking lot
- 5,000-square-foot general light industry building to represent the operation and maintenance building
- 140,000-square-foot general heavy industry to represent the substation area
- 2,400-square-foot unrefrigerated warehouse – no rail to represent the maintenance facility
- 5,000-square-foot unrefrigerated warehouse – no rail to represent the warehouse facility

Modeling input data were based on this anticipated construction schedule and phasing. Construction equipment and usage required for each phase were obtained using CalEEMod defaults for the land use types that make up the project site, information provided by the applicant, and default parameters contained in the model for the project site (San Bernardino County) and land uses.

The construction duration is assumed to be approximately 18 months, assumed to occur from March 2026 through the end of August 2027. Project construction would consist of different activities undertaken in phases, through to the operation of the project. Typical construction equipment would be used during all phases of project construction and would be stored within the staging area, potentially including bulldozers, backhoes, graders, and water trucks. Table 10 shows the project's anticipated construction schedule, presents an estimate of the maximum number of pieces of equipment for each construction phase, and conservatively assumes that equipment would be operating 10 hours per day, 5 days per week for the duration of the construction phase. The unmitigated construction emissions from CalEEMod include controls to comply with any MDAQMD fugitive dust control rules, discussed further in Section 7.4, and/or applicant-committed measures, APM-1 through APM-9, discussed further in Section 7.1. In CalEEMod, to reflect these fugitive dust controls the following controls were included in the unmitigated model since they required controls: reduce speed on unpaved roads to 25 miles per hour, water exposed areas two times per day, and water the unpaved roads traveled to the project a minimum of two times per day.

Table 10. Construction Anticipated Schedule, Trips, and Equipment

Phase (Duration)	Equipment Used			Daily Vehicle Trips
	Type	Number	Hours/Day	
1. Stage 1	Tractors/loaders/backhoes	4	10	
	Off-highway truck	1	10	

March 1, 2026–October 31, 2026 (175 working days)	Plate compactors	2	10	
	Excavators	1	10	
	Graders	1	10	
	Rubber-tired bulldozers	2	10	
2. Stage 2* June 1, 2026–February 28, 2027 (195 working days)	Cranes	2	10	Assumed a maximum of 600 one-way worker trips for all phases at any time. No one-way vendor trips for all phases at any time. 234 one-way on-site haul truck trips for all phases at any time. Assumed 3 miles of on-site truck travel for each phase.
	Forklifts	5	10	
	Trenchers	1	10	
	Rubber-tired loaders	1	10	
	Generator sets	15	10	
	Off-highway truck	1	10	
	Excavators	4	10	
	Bore/drill rigs	1	10	
	Rubber tired dozers	1	10	
	Tractors/loaders/backhoes	5	10	
	Welders	12	10	
3. Stage 3* December 1, 2026–June 30, 2027 (152 working days)	Off-highway truck	1	10	
	Forklifts	3	10	
	Excavator	1	10	
	Skid steer loader	1	10	
	Tractors/loaders/backhoes	1	10	
4. Stage 4* June 1, 2027–August 31, 2027 (66 working days)	Off-highway truck	1	5	
	Forklifts	1	10	
	Skid steer loader	1	10	
	Tractors/loaders/backhoes	1	10	
5. Paving June 17, 2026–June 30, 2026 (10 working days)	Pavers	1	8	
	Paving equipment	1	8	
	Sweepers/scrubbers	1	8	
	Rollers	1	8	
6. Architectural Coating July 1, 2026–July 14, 2026 (10 working days)	Air compressors	5	8	

Source: Appendix A

Notes: The CalEEMod one-way trips lengths for workers and haul trucks have been increased to 28 miles per one way trip, which is a weighted average accounting for the trips from varying distances. For the other parameters not provided in the table (e.g., equipment horsepower and load factor), CalEEMod defaults were used.

*Due to the overlap of the 4 Stages, Stage 2 and Stage 3 were broken down into 'Stage 2' and 'Stage 2-Phase 2', 'Stage 3' and 'Stage 3- Phase 2', and 'Stage 4' and 'Stage 4- Phase 2'. in the CalEEMod Appendix A to ensure that works and haul truck trips are not double counted. The equipment in these phases are identical.

In addition to MDAQMD Rule 403 detailed in Section 7.4 of this report, California regulations also limit idling from both on-road and off-road diesel-powered equipment.

6.2 Operational Emissions

When construction is completed, the project would be an operational 300-MW, 2,670-acre solar project with a 300-MW BESS. Criteria pollutant and GHG emissions from the operation of the project were

estimated using CalEEMod version 2022.1.1.29. Year 2028 was assumed as the first full year of operations after completion of construction. The operational emissions were calculated based on CalEEMod defaults associated with the project's land use types. Analysis of the project's likely impact on regional air quality during project operation takes into consideration four types of sources: 1) area, 2) energy, 3) mobile, and 4) off-road.

Area Sources

CalEEMod was used to estimate operational emissions from area sources, including emissions from architectural coatings and landscape maintenance equipment. Emissions associated with electricity use and air conditioning are calculated as part of building energy use in CalEEMod. The project would not include woodstoves or fireplaces (wood or natural gas). Therefore, area source emissions associated with consumer products, hearths and consumer products were not included.

CalEEMod calculates the VOC evaporative emissions from application of residential and nonresidential surface coatings based on the VOC emission factor, the building square footage, the assumed fraction of surface area, and the reapplication rate. The VOC emission factor is based on the VOC content of the surface coatings and no reapplication is assumed. Coating for the parking surface area was also estimated with CalEEMod defaults.

Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chainsaws, and hedge trimmers. The emissions associated with landscape equipment use are estimated based on CalEEMod default values for emission factors (grams per square foot of nonresidential building space per day) and number of summer days (when landscape maintenance would generally be performed) and winter days. For San Bernardino County, the average annual "summer" days are estimated to be 180 days. Emissions associated with potential landscape maintenance equipment were included, and no emission reduction features related to electric landscape equipment were assumed, to conservatively capture potential project operational emission sources.

Energy Sources, Waste, Water, and Refrigeration

As represented in CalEEMod, energy sources include emissions associated with building electricity, with no natural gas included. Electricity use would contribute indirectly to criteria air pollutant emissions; however, the emissions from electricity use and refrigeration are only quantified for GHGs in CalEEMod, since criteria pollutant emissions occur at the site of the power plant, which is typically off-site. Electricity use is calculated using CalEEMod defaults for all on-site buildings. Emissions from waste and air conditioning have been calculated for the operation and maintenance building, maintenance facility, and warehouse facility.

The air conditioning units will use R-32 or a similar reclaimed refrigerant, compliant with the Prohibitions on Use of Certain Hydrofluorocarbons in Stationary Refrigeration, Stationary Air-conditioning and Other End-Uses (California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 on Climate Change, Article 4, Subarticle 5, Section 95374). It meets technical requirements, with a Global Warming Potential less than 750, and regulatory safety standards, as R-32 is classified as A2L (mildly flammable). The proposed refrigerant would comply with the sale and distribution prohibition timelines established in SB 1206 (Skinner, Chapter 884, Statutes of 2022) (Health and Safety Code, section 39735) since it is a reclaimed refrigerant with a GWP under 750.

Emissions from water are calculated for both the outdoor water use and the water use associated with the operation and maintenance building. Outdoor water use during operations is conservatively estimated at a

total of up to 20 acre-feet per year (a conservative estimate given that only an estimated 5.6 acre-feet per year of water is anticipated for panel washing, dust control and suppression during operation).

Mobile Sources

The project would generate criteria pollutant emissions from mobile sources (vehicular traffic) as a result of project operations. The project requires minimal operation and maintenance activities and would not require the presence of full-time employees. However, for estimation of operational emissions, it is conservatively assumed that for maintenance, some employees would commute to the site. These are very conservative assumptions because no daily travel to the site is anticipated during operations. The annual operations are assumed to be as follows:

- Routine maintenance activities would include panel washing, which is expected to occur three times annually over a 3-week period. Panel washing activities and workers visiting the substation as needed for maintenance, equipment operation, and/or security are estimated to require additional daily trips of up to 40 workers (which includes the truck transporting the water) during each event for a total of 80 one-way worker trips per day (weekdays) during a peak operational maintenance event. However, this does not occur on a daily basis and will only occur during such maintenance events.
- The default model generated trip lengths for commercial-work were used for the workers' commute; medium heavy-duty trucks and heavy-duty trucks were chosen to represent the worker vehicles and the truck transporting the water, and trip purpose was designated as 100% primary trips.

SF_6 Emissions

CEC Appendix B Item (E) GHG requires "The emission rates of criteria pollutants and greenhouse gases (CO2, CH4, N2O, and SF_6) from the stack, cooling towers, fuels and materials handling processes, delivery and storage systems, and from all onsite secondary emission sources". The project does not include stacks, cooling towers, fuels and materials handling processes or delivery and storage systems. The project would have the potential for fugitive emissions of SF_6 from circuit breakers and emissions factors for SF_6 consumption are discussed in Section 7.2.

The project would include 500-kV circuit breakers that contain SF_6. New circuit breaker designs have been developed over the past several years to minimize the potential for leakage (CARB 2018). In addition, the equipment would comply with CARB's Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear regulations. CARB's current regulations require that switchgear does not exceed a maximum allowable annual SF_6 emissions rate (leakage rate) of 1 percent. The only equipment within the substations and switchyards that would have SF_6 gas would be the six 500-kV circuit breakers. The utility switchyard would require five circuit breakers and the substation would require one breaker.

BESS Refrigerant

[redacted]



BESS Efficiency

The average loss in round-trip efficiency for the life of a lithium-ion BESS is approximately 15%, although loss in round trip efficiency is dropping as the technology is getting more efficient (Grimaldi, et al 2023). Assuming the 300 megawatt-hour (MWh) BESS completes 1 full cycle per day and is entirely charged from the grid, this would require approximately 3.6 hours of charging at full capacity per day and would result in approximately 45MWh of lost round-trip efficiency per day, or 16,425 MWh of lost round-trip efficiency per year. LADWP is the energy provider that would serve the project during times when solar power is unavailable. The most current available Power Content Label published by the California Energy Commission for LADWP indicates that the GHG emissions intensity factor under the base plan is 499 pounds of CO_2e per MWh (LADWP 2023). With California's anticipated achievement of carbon neutrality by 2045, an annual reduction of 24.95 pounds CO_2e per MWh is applied to the 499 pounds of CO_2e per MWh GHG emissions intensity factor. The cumulative impact of the annual incremental reduction accounts for additional renewable energy facilities built during the life of the project, and subsequent exponential decay of natural gas power generation by 2045.Therefore, total indirect GHG emissions from round-trip efficiency loss would total approximately 39,035 MT CO_2e, if the BESS were charged only by the grid (Appendix A). This is a conservative estimate as the BESS would be charged by the project's solar arrays. This estimate also is based on the 2023 emission intensity factors for electricity provided by LADWP and does take into account reductions in emission intensity factors over the life of the project as additional renewable energy is added to LADWP's power mix.

6.3 Greenhouse Gas

This analysis quantifies the project's total annual GHG emissions from construction. This analysis evaluates the significance of the project's GHG emissions by assessing the project's consistency with CEQA guidance.

6.4 Toxic Air Contaminants Impacts (Construction and Operations)

Potential TAC impacts were evaluated in this analysis by conducting a qualitative analysis. The TAC that is the focus of this analysis is DPM because it is known that DPM would be emitted during project construction and operation. Construction-related activities that would result in temporary, intermittent emissions of DPM would be from the exhaust of off-road equipment and on-road heavy-duty trucks. On-road diesel-powered haul trucks traveling to and from the construction area to deliver materials and equipment are less of a concern because they do not operate at any one location for extended periods of time such that they would expose a single receptor to excessive DPM emissions. The project is consistent with TAC-related rules and regulations, and the CalEEMod modeling shows the low-exhaust DPM during

construction and operation (see Appendix A). Furthermore, implementation of MDAQMD Rule 403, discussed in Section 7.4, and applicant-committed control measure APM-9, discussed in Section 7.1, would result in the reduction of DPM exhaust emissions in addition to criteria pollutant emissions, particularly the measures to minimize engine idling time and maintain construction equipment in proper working condition and according to manufacturer's specifications.

7 IMPACT ANALYSIS

7.1 Applicant-Proposed Measures

The applicant identified and committed to implementing the following Applicant-Proposed Measures (APMs) as part of the proposed project to avoid or substantially lessen potentially significant impacts to air quality, to the extent feasible. The APMs, where applicable, are discussed in the impact analysis section below. These measures include the following:

- **APM AIR-1:** The applicant shall use periodic watering for short-term stabilization of disturbed areas to minimize visible fugitive dust emissions. Use of a water truck to maintain surface moisture on disturbed areas and surface application of water during visible dusting episodes shall be considered sufficient to maintain compliance.
- **APM AIR-2:** The applicant shall apply Best Management Practices (BMPs) to prevent project-related visible bulk materials transport (trackout) onto paved surfaces. BMPs may include, but not be limited to, the following:
  - Use of wheel-washers (or equivalent) installed at all access points and laydown areas where trackout onto paved public roads could occur.
  - Construction of stabilized construction site entrance/exit areas.
  - Implementation of regular street sweeping/cleaning of paved surfaces.
  - Installation of corrugated steel panels at all site exits.
- **APM AIR-3:** The applicant shall cover haul vehicles maintained paved surfaces loaded with earthen materials while operating on publicly maintained paved surfaces.
- **APM AIR-4:** The applicant shall stabilize graded site surfaces upon completion of grading when subsequent development is delayed or expected to be delayed more than 14 days, except when such a delay is due to precipitation that dampens the disturbed surface sufficiently to eliminate visible fugitive dust emissions.
- **APM AIR-5:** The applicant shall cleanup project-related visible bulk materials transport (trackout) or spills on publicly maintained paved surfaces within 24 hours.
- **APM AIR-6:** The applicant shall discontinue non-essential earth-moving activities under high wind conditions when wind speeds exceed 25 miles per hour and those activities result in visible dust plumes. All grading activities shall be suspended when wind speeds are greater than 30 miles per hour.
- **APM AIR-7:** The applicant shall limit the speed of vehicles traveling on unpaved roads and disturbed areas to 15 miles per hour.
- **APM AIR-8:** The applicant shall apply water to all unpaved roads and unpaved parking areas actively used during construction, except when moisture remains in the soils such that dust is not produced when driving on unpaved roads.

- **APM AIR-9:** The applicant, when entering into construction contracts or when procuring off-road equipment or vehicles for on-site construction or operations and maintenance activities, shall ensure that only new model year equipment or vehicles are obtained. An Exhaust Emissions Control Plan that identifies each off-road unit's certified tier specification, Best Available Control Technology, as well as the model year of all haul trucks to be used on the project that are under direct control of the applicant or its construction contractor shall be submitted to BLM for review and approval at least 30 days prior to commencement of construction activities. The following measures would be included with contract or procurement specifications and in the Exhaust Emissions Control Plan:
    - All construction diesel engines not registered under California Air Resources Board's Statewide Portable Equipment Registration Program, with a rating of 50 hp or higher shall meet the Tier 4 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 demonstrates that such engine is not available for a particular item of equipment. If a Tier 4 engine is not available for any off-road equipment larger than 50 hp, a Tier 3 engine shall be used or that equipment shall be equipped with retrofit controls to reduce exhaust emissions of nitrogen oxides and diesel particulate matter to no more than Tier 3 levels unless certified by the engine manufacturers that the use of such devices is not practical for specific engine types.
    - All diesel-fueled engines used in the construction of the facility shall have clearly visible tags showing that the engine meets the standards of this measure.
    - All equipment and trucks used in the construction or operation and maintenance of the facility shall be properly maintained and the engines tuned to the engine manufacturer's specifications.
    - 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.

7.2 Environmental Impacts

Impact AQ-1 Would the project conflict with or obstruct implementation of the applicable air quality plan? (Less than Significant)

A project would conform with applicable adopted plans if it complies with the rules, regulations, and emission control strategies in the applicable air quality attainment plans. The project would comply with the applicable rules and regulations, including the use of standard control measures for construction equipment and fugitive PM_{10}.

Consistency with air quality plans is typically conducted based on a comparison of project-generated growth in employment, population, and vehicle miles traveled within the region, which is used for development of the emissions inventories contained in the air quality plans. The region's SIP comprises the MDAQMD air quality plans: 2022 8-Hour Ozone SIP, 2016 8-Hour Ozone SIP, 2015 8-Hour Ozone Reasonable Available Control Technology SIP, 2014 Updates to the 1997 8-Hour Ozone SIP, February 2008 Ozone Early Progress Plan, 2004 Southeast Desert Modified Air Quality Maintenance Area Ozone Plan, and 1995 Mojave Desert Planning Area PM10 Attainment Plan. Project compliance with all MDAQMD rules and regulations results in conformance with MDAQMD air quality plans. These air quality attainment plans are a compilation of new and previously submitted plans, programs (e.g., monitoring, modeling, permitting, etc.), district rules, state regulations, and federal controls describing how the state will attain ambient air quality standards. These SIPs and associated control measures are

based on information derived from projected growth in the air district in order to project future emissions and then determine strategies and regulatory controls for the reduction of emissions. Growth projections are based on the general plans developed by the counties and incorporated cities in each county.

Although the project would contribute to energy supply, which is one factor of population growth, the project would not significantly increase employment, population, or growth within the region. The project does not include residential development or large local or regional employment centers, and thus would not result in significant population or employment growth. Furthermore, the operation of the project would create renewable energy over its planned lifetime, helping California meet its RPS, and decrease the need for energy from fossil fuel–based power plants in the state, which is considered a beneficial impact to statewide air quality. The energy produced by the project would displace the criteria pollutant emissions that would otherwise be produced by existing, business-as-usual power generation resources (including natural gas and coal).

The thresholds of significance, adopted by MDAQMD, determine compliance with the goals of attainment plans in the region. As such, emissions below MDAQMD daily and annual significance emissions thresholds would not conflict with or obstruct implementation of the applicable air quality plans. The project implementation would generate emissions of criteria air pollutants during construction and operation. The emissions from project construction (Table 11) and operation (Table 12) are below the thresholds of significance; therefore, the project does not conflict with implementation of MDAQMD applicable air quality plans. The detailed assumptions and calculations, as well as CalEEMod outputs, are provided in Appendix A of this report. Therefore, the project would have less-than-significant impacts and no mitigation measures are required.

Impact AQ-2 Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard? (Less than Significant)

MDAQMD's thresholds of significance represent the allowable emissions a project can generate without generating a cumulatively considerable contribution to regional air quality impacts. Therefore, a project that would not exceed MDAQMD's thresholds of significance on a project level also would not be considered to result in a cumulatively considerable contribution to these regional air quality impacts. The region is designated as nonattainment for federal and state 8-hour O_3 standards, federal and state 24-hour PM_{10} standards, and state $PM_{2.5}$ standards. Impacts related to construction and operation of the project are addressed separately below.

Construction

Project implementation would generate emissions of criteria air pollutants during construction. The estimated unmitigated emissions from construction of the project are summarized in Table 11. The detailed assumptions and calculations, as well as CalEEMod outputs, are provided in Appendix A of this report.

Table 11. Unmitigated Construction Emissions Summary

Construction Year	Unmitigated Construction Emissions					
	VOC	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2
Pollutant Emission (pounds per day)						
2026 peak daily emission	16.1	129.2	190.8	31.1	11.8	0.37

Construction Year	Unmitigated Construction Emissions					
	VOC	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2
2027 peak daily emission	12.5	106.6	140.6	23.2	7.5	0.33
MDAQMD daily significance thresholds	*137*	*137*	*548*	*82*	*65*	*137*
Threshold exceeded?	***No***	***No***	***No***	***No***	***No***	***No***
Pollutant Emission (short tons per year)						
2026 annual emissions	*1.32*	*11.37*	*15.28*	*3.08*	*1.11*	*0.03*
2027 annual emissions	*0.53*	*4.62*	*7.17*	*1.77*	*0.49*	*0.02*
MDAQMD annual significance thresholds	*25*	*25*	*100*	*15*	*12*	*25*
Threshold exceeded?	***No***	***No***	***No***	***No***	***No***	***No***
General Conformity De Minimis thresholds	*25*	*25*	*n/a*	*70*	*70*	*n/a*
Threshold exceeded?	***No***	***No***	***n/a***	***No***	***No***	***n/a***

Source: Emissions were quantified using CalEEMod version 2022.1.1.29 (CAPCOA 2023). Maximum winter reported for pound/day emissions.

Note: Model results (summer, winter, and annual) and assumptions are provided in Appendix A of this report. n/a – not applicable

As shown in Table 11, even without incorporation of dust control practices (APM AIR-1 through AIR-8) and for off-road equipment engine standards (APM AIR-9), estimated unmitigated construction emissions for all pollutants are below MDAQMD daily and annual significance thresholds. The annual emissions are also below the applicable General Conformity De Minimis thresholds. The combined construction emissions from all components of the project are below the recommended MDAQMD thresholds of significance. Therefore, project construction would have a less-than-significant impact. In CalEEMod, the following measures were included in this unmitigated model to reflect common measures for fugitive dust control discussed further in Section 7.1 (APM AIR-1 through AIR-8) and Section 7.4 (MDAQMD Rule 403): reduce speed on unpaved roads to 15 miles per hour, water exposed areas two times per day, and water the unpaved roads traveled to the project a minimum of two times per day. As presented above, the project would not violate any air quality significance thresholds or contribute substantially to an existing or projected air quality violation and the project would have a less-than-significant impact with respect to community risk caused by construction activities.

Operations

Project operations are limited to panel washing and maintenance, which are conservatively assumed to be up to 80 one-way employee vehicle trips per weekday. Project operations would generate VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions from mobile sources and water use. The estimated emissions from operation of the project are summarized in Table 12. Complete details of the emissions calculations are provided in Appendix A.

Table 12. Unmitigated Operational Emissions Summary

Operation Year 2028	Unmitigated Operational Emissions Summary					
	VOC	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2
Pollutant Emission (pounds per day)						
Mobile	0.19	5.24	2.49	2.91	0.82	0.09
Area	1.08	0.06	6.62	0.01	0.01	<0.005
Energy	0	0	0	0	0	0
Water	0	0	0	0	0	0
Water	0	0	0	0	0	0

	Unmitigated Operational Emissions Summary					
Operation Year 2028	**VOC**	**NO_x**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**
Refrigeration	0	0	0	0	0	0
Total	**1.28**	**5.29**	**9.12**	**2.93**	**0.83**	**0.09**
MDAQMD significance thresholds	*137*	*137*	*448*	*82*	*64*	*137*
Threshold exceeded?	***No***	***No***	***No***	***No***	***No***	***No***
Pollutant Emission (short tons per year)						
Mobile	*0.02*	*0.73*	*0.32*	*0.38*	*0.11*	*0.01*
Area	*0.10*	*0.005*	*0.59*	*0.001*	*<0.005*	*<0.005*
Energy	*0*	*0*	*0*	*0*	*0*	*0*
Water	0	0	0	0	0	0
Water	0	0	0	0	0	0
Refrigeration	0	0	0	0	0	0
Total	***0.12***	***0.74***	***0.92***	***0.38***	***0.11***	***0.01***
MDAQMD significance thresholds	*25*	*25*	*100*	*15*	*12*	*25*
Threshold exceeded?	***No***	***No***	***No***	***No***	***No***	***No***
General Conformity De Minimis thresholds	*25*	*25*	*n/a*	*70*	*70*	*n/a*
Threshold exceeded?	***No***	***No***	***n/a***	***No***	***No***	***n/a***

Source: Emissions were quantified using CalEEMod version 2022.1.1.29 (CAPCOA 2023). Maximum summer reported for pound/day emissions.

Note: Model results (summer, winter, and annual) and assumptions are provided in Appendix A.

Once construction is complete, the project would operate for approximately 40 years. At the end of the project site operational term, the applicant may determine that the project site should be decommissioned and deconstructed, or it may seek an extension of its conditional use permit. The emissions associated with decommissioning of the project are not quantitatively estimated, as the extent of activities and emissions factors for equipment and vehicles at the time of decommissioning are unknown. The overall activity would be anticipated to be somewhat less than project construction, and the emissions from off- and on-road equipment are expected to be much lower than those for the project construction. However, without changes in fugitive dust control methods, it is likely that fugitive dust emissions would be closer to those estimated for construction. Overall, similar to construction, emissions associated with decommissioning would be less than significant.

As Table 12 shows, estimated unmitigated operational emissions for all pollutants are below MDAQMD significance thresholds; and MDAQMD rules would be implemented during construction and operation of the project, including an operational DCP outlining strategies for controlling dust emissions during project operations. The project APMs are listed in Section 7.1 and the MDAQMD (Rule 403.2) requirements are listed in Section 7.4 of this report. The annual emissions are also below the applicable General Conformity De Minimis thresholds. Also, project operations would not affect traffic volumes at any affected intersection. Therefore, the project would not exceed the CO screening criteria or the General Conformity de minimis thresholds. Therefore, based on the above criteria, the project would have a less-than-significant impact related to CO hotspots. The combined construction emissions and combined operational emissions from all components of the project are below the recommended MDAQMD thresholds of significance. Therefore, the project would not be anticipated to exceed any significance thresholds and would have a less-than-significant contribution to cumulative impacts.

Impact AQ-3 Would the project expose sensitive receptors to substantial pollutant concentrations? (Less than Significant Impact)

Some population groups, such as children, the elderly, and acutely and chronically ill persons are considered more sensitive to air pollution than others. Sensitive receptor locations typically include residential areas, hospitals, elder-care facilities, rehabilitation centers, daycare centers, and parks. The project site is composed of rural desert land and is almost entirely undeveloped. The proposed project location is not situated close to any non-residential areas that might be sensitive to noise, such as schools, hospitals, daycare centers, or long-term care establishments. The nearest schools, Baker Elementary, Middle, and High Schools, are over 6.5 miles away, situated in the northeastern part of Baker. The closest residences to the project location can be found next to the Rasor Road service station, roughly 260 feet southwest of the proposed boundary. This area encompasses a stand-alone house and accommodation for four workers. There are no other sensitive receptors within 1,500 feet of the project site and actual construction occurs more than 3,500 feet from this stand-alone home.

The project would not produce high doses of any TACs during construction or operation. Implementation of the project would not result in the long-term operation of any emission sources that would adversely affect nearby sensitive receptors. Short-term construction activities (18 months) could result in temporary increases in pollutant concentrations. Emissions of all criteria pollutants are below the MDAQMD thresholds and would not have any significant impact. The project's emissions of TACs would be minimal and would consist of DPM emissions during construction activities. Although other TACs exist (e.g., benzene, 1,3-butadiene, hexavalent chromium, formaldehyde, methylene chloride), they are primarily associated with industrial operations and the project would not include any industrial sources of other TACs.

Construction-related activities that would result in temporary, intermittent emissions of DPM would be from the exhaust of off-road equipment and on-road, heavy-duty trucks. On-road, diesel-powered haul trucks traveling to and from the construction area to deliver materials and equipment are less of a concern because they do not operate at any one location for extended periods of time such that they would expose a single receptor to excessive DPM emissions.

Based on the construction-related emission calculations conducted (see Appendix A), maximum daily emissions of exhaust PM_{10} (used as a surrogate for DPM) would be 4.72 pounds during peak construction. A portion of these emissions would be related to haul trucks traveling to and from the project site. In addition, studies show that DPM is highly dispersive and that concentrations of DPM decline with distance from the source (e.g., 500 feet from a freeway, the concentration of DPM decreases by 70%) (Roorda-Knape et al. 1999; Zhu et al. 2002, cited in CARB 2005:9). Additionally, there are no nearby sensitive receptors close to the project site. Although there is a stand-alone house roughly 260 feet southwest of the proposed boundary, this would accommodate four workers. Although the project boundary is 260 feet from this house, the nearest construction location actually occurs between 3,500 feet and 20,000 feet from the house. As such, construction would not be limited to only one portion of the project site but would occur throughout the project site in phases. Construction-related TAC emissions would not expose sensitive receptors to an incremental increase in cancer risk greater than 10 in 1 million or a hazard index greater than 1.0 because the low exposure level reflects the 1) relatively low mass of DPM emissions that would be generated by construction activity on the project site (i.e., less than 4.29 pounds per day for 2026 and 3.15 pounds per day for 2027 of exhaust PM_{10}), 2) the relatively short duration of DPM-emitting construction activity at the project site (18 months), and 3) the highly dispersive properties of DPM.

Operation-related TAC emissions would be negligible, and the project would be controlled remotely, with few visits to the site for maintenance. Also, any on-road, diesel-powered haul trucks traveling to and from

the construction area to deliver materials and equipment are less of a concern because they do not operate at any one location for extended periods of time such that they would expose a single receptor to excessive DPM emissions. No other TAC emission sources will occur during operations.

Furthermore, to fulfill the CEC requirements in Appendix B of the AFC Program Guidance for public health sections (g)(9)(A) through (g)(9)(D) a health risk assessment including air dispersion modeling has been completed for project construction. Estimates of the health risks at the MEIR from exposure to DPM during project construction are summarized in Appendix B and were below the MDAQMD's thresholds of significance. Therefore, construction of the project would not expose existing sensitive receptors to substantial concentrations of hazardous air pollutants from project construction. Therefore, construction- and operation-generated emissions of TACs would be less than significant.

BESS Thermal Runaway

The BESS would use lithium-ion batteries (LiBs), which are found in myriad consumer products (e.g., phones, computers). Under normal operating conditions, LiBs produce no emissions and are safe. However, in some situations LiBs may fail and then overheat. If the overheating is not interrupted by mitigation measures, the LiB may enter "thermal runaway," a process through which the battery overheats beyond its capacity to dissipate heat. If thermal runaway is not controlled by safety systems, a single battery could catch fire, and that fire could spread to other adjacent batteries. Although redundant safety systems are available to prevent this multi-step process from occurring, the thermal runaway modeling assumes that such systems fail.

To provide a conservative analysis, the worst-case scenario, in terms of the extent and duration of the thermal runaway event, was determined based on the UL 9540A module level and unit level testing results. With all active control measures disabled, the UL 9540A unit level testing forced six cells into thermal runaway, which resulted in propagation to a seventh cell; however, thermal runaway did not propagate beyond the seventh cell. The duration of the UL 9540A unit level testing was 2.5 hours. This analysis conservatively assumed every cell in a battery tray (112 cells) would be affected during a thermal runaway event (16 times the UL 9540A unit level testing result), representing a reasonable worst-case scenario. To be conservative, the amount of time required for a battery tray fire to burn itself out during the UL 9540A module level testing, which was approximately 0.5 hour, was used to estimate the emission rate.

Estimates of acute non-cancer health risks at the nearest sensitive receptor from exposure to thermal runaway emissions are summarized in Table 4 of Appendix C and compared to the thresholds of significance. At the nearest sensitive receptor, the estimated acute HI for all the TACs from a thermal runaway event were below the threshold of significance. As a result, the project would not expose sensitive receptors to substantial concentrations of hazardous air pollutants from a thermal runaway event. As presented in Table 5 of Appendix C, the estimated concentrations of CO at the nearest sensitive receptor from a thermal runaway event would be below the EPA SILs. Therefore, the project's criteria air pollutant emissions during a thermal runaway event would not cause or contribute to an exceedance of the ambient air quality standards. In addition, the project would not expose sensitive receptors to substantial concentrations of hazardous air pollutants from a thermal runaway event.

Fugitive Dust

During construction and operations activities, the project would implement dust control measures as shown in Section 7.1 and Section 7.4 of this report, including an operational DCP, to ensure receptors in the project vicinity would not be impacted by the project's long-term dust emissions during operations.

Naturally Occurring Asbestos

Airborne asbestos is classified as a known human carcinogen; CARB identified asbestos as a TAC in 1986. The project is not located in a geologic setting with a potential to host asbestos and, therefore, the project would not expose sensitive receptors to asbestos (CARB 2000a).

Impact AQ-4 Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? (Less than Significant Impact)

Land uses commonly considered to be potential sources of obnoxious odorous emissions include agriculture (farming and livestock), wastewater treatment plants, food processing plants, chemical plants, composting facilities, refineries, landfills, dairies, and fiberglass molding. The project would not be a source of any odors during operations. Construction of the project could result in emission of odors from construction equipment and vehicles. During construction, a limited number of diesel engines would be operated on the project site for limited durations. Diesel exhaust and VOCs from these diesel engines would be emitted; however, the short duration of construction activities is expected to last approximately 18 months, limited in extent at any given time, and distributed through the project site. In addition, emissions would disperse rapidly from the project site and diesel exhaust odors would be consistent with existing vehicle odors in the area.

The project does not include any uses identified as being associated with odors. In addition, beyond one residence adjacent to the project site, there are not substantial numbers of people within the vicinity. Considering this information, construction and operation of the project would not create other emissions or odors adversely affecting a substantial number of people; impacts would be less than significant.

Impact GHG-1 Would the project generate GHG emissions, either directly or indirectly, that may have an adverse effect on the environment? (Less than Significant Impact)

Construction

Construction of the project would result in GHG emissions, which are primarily associated with use of off-road construction equipment, on-road vendor trucks, and worker vehicles. Total GHG emissions from all phases of construction activities were amortized over the estimated 40-year life of the project and added to the annual operational emissions of GHGs. The project would offset GHG emissions through renewable energy generation and thereby result in environmental benefits by lessening the impacts of global climate change; as such, the annual displaced GHG emissions were estimated to include all direct and indirect emissions associated with implementation of the project. Project decommissioning emissions were not calculated as the equipment and fuel types that would exist 40 or more years in the future are unknown. Also, as described above, it is anticipated that the decommissioning emissions would be lower than the construction emissions.

Project construction emissions were calculated and compared to the MDAQMD daily and annual significance thresholds. Construction emissions were also amortized over a 40-year project lifetime. CalEEMod was used to calculate the annual GHG emissions based on the construction scenario described. Construction of the project is anticipated to last approximately 18 months. On-site sources of GHG emissions include off-road equipment and off-site sources including haul trucks, vendor trucks, and worker vehicles. Table 13 presents total construction emissions for the project from on-site and off-site emission sources for the daily and annual time period.

Table 13. Estimated Daily and Annual Construction Greenhouse Gas Emissions

Construction Years	CO_2	CH_4	N_2O	CO_2e
Pounds per Day				
2026	55,476	1.34	4.00	56,792
2027	49,643	0.83	3.97	50,850
Total	105,119	2.17	7.97	107,642
MDAQMD Daily GHG threshold	N/A	N/A	N/A	497,137
Threshold exceeded?	***N/A***	***N/A***	***N/A***	***No***
Tons per Year				
2026	4,870	0.08	0.39	4,993
2027	3,090	0.03	0.31	3,185
Total	7,960	0.11	0.70	8,178
40-year amortized construction emissions				*204*
MDAQMD Annual GHG threshold	N/A	N/A	N/A	90,718
Threshold exceeded?	***N/A***	***N/A***	***N/A***	**No**

Note: N/A = not applicable. See Appendix A of this report. The MDAQMD daily GHG threshold is 548,000 short tons converted to metric tons. The MDAQMD Annual GHG threshold is 100,000 short tons converted to metric tons.

As shown in Table 13, the estimated total GHG emissions during construction would be approximately 8,178 metric tons CO_2e over the construction period, below the MDAQMD threshold. Estimated project-generated construction emissions amortized over 40 years would be approximately 204 metric tons CO_2e per year. As with project-generated construction criteria air pollutant emissions, GHG emissions generated during construction of the project would occur only when construction is active, lasting only for the duration of the construction period, and would not represent a long-term source of GHG emissions. Therefore, the construction activities would not generate GHG emissions, either directly or indirectly, that would have an adverse effect on the environment.

Operation

Operation of the project would generate GHG emissions through motor vehicle trips to and from the project site and water use. CalEEMod was used to calculate the annual GHG emissions based on the operational assumptions described in Section 6.2 of this report. The estimated operational project-generated GHG daily and annual emissions are shown in Table 14.

Table 14. Estimated Annual Operational GHG Emissions

Sector	GHG Emissions (pounds per day)			
	CO_2	CH_4	N_2O	CO_2e
Mobile	9,711.10	0.03	1.07	10,057.44
Area	27.26	<0.005	<0.005	27.35
Energy	144.40	0.01	0.005	144.95
Water	52.18	0.23	0.01	59.66
Waste	5.34	0.53	0.00	18.67
Refrigeration	N/A	N/A	N/A	1.04
Circuit Breaker SF_6	0	0	0	6.07

Stationary	0	0	0	0
Total	9,914	0.80	1.07	10,315
			Total operational daily GHGs	***10,315***
			MDAQMD Daily Significance threshold	***497,137***
Sector	**GHG Emissions (metric tons per year)**			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Mobile	1,148	<0.005	0.13	1,188
Area	2.23	<0.005	<0.005	2.23
Energy	23.91	<0.005	<0.005	24.00
Water	8.64	0.04	<0.005	9.88
Waste	0.88	0.09	0.00	3.09
Refrigeration	N/A	N/A	N/A	0.17
Circuit Breaker SF_6	0	0	0	2,214
Stationary	0	0	0	0
Total	**1,184**	**0.13**	**0.13**	**3,441**
			Amortized construction emissions	204
			Total annual operational + amortized construction GHGs	***3,645***
			Total operational (40 years) + amortized construction GHGs	***137,844***
			Displaced annual emissions (from project operation)	***300,786***
			MDAQMD annual significance threshold	***90,718***

Notes: N/A = not applicable. See Appendix A of this report. Emissions reflect operational year 2028. The MDAQMD daily GHG threshold is 548,000 short tons converted to metric tons. The MDAQMD GHG threshold is 100,000 short tons converted to metric tons.

As shown in Table 14, estimated annual project-generated GHG emissions would be approximately 3,441 MT CO_2e per year as a result of project operations only. After summing the amortized project construction emissions, total GHGs generated by the project would be approximately 3,645 MT CO_2e per year. The project's annual indirect GHG emissions from the displacement of fossil fuel fired electricity generation is significantly higher than the project's annualized direct and indirect emissions sources; as such, the overall effect of the project would reduce GHG emissions. Therefore, the project would have a beneficial GHG emissions impact, and impacts would be less than significant.

Approximately 64 percent of total operational emissions are associated with the emissions of SF_6, which is a component in the circuit breakers of the project. The project would include one circuit breaker to support the substation and utility switchyard (five circuit breakers with space to add one additional in the future). As detailed in the methodology section (Section 6.2), the use of SF_6 in electric utility systems and switchgear, including circuit breakers, poses a concern, because this pollutant has an extremely high global warming potential (one pound of SF_6 is the equivalent warming potential of approximately 24,600 pounds of CO_2). The amount of SF_6 in each circuit breaker can vary based on the manufacture. Annual leakage for a typical General Electric 500 kV circuit breaker is $\leq$0.5% with the total weight around five kilograms per pole. There are three poles per circuit breaker for a total of 18 poles for all six circuit breakers, and total SF_6 gas weight of approximately 90 kilograms or 198 pounds (0.09 MT). Based on the global warming potential of SF_6, the circuit breakers would result in up to 2,214 MT of CO_2e emissions, annually.

In compliance with CARB regulations, the applicant would be required to regularly inventory gas insulated switchgear equipment, measure quantities of SF_6 and submit an annual report to CARB. In

addition, the analysis assumed that all circuit breakers would contain SF_6 as a conservative analysis. As discussed in the regulatory section, CARB has implemented phasing requirements for the elimination of SF_6 from electrical equipment, including circuit breakers. While the analysis assumes that all circuit breakers would contain SF_6, it is possible that circuit breakers in the later phases may not contain SF_6 and/or as circuit breakers are replaced they would be replaced with non-SF_6 technology. Additionally, as discussed in the methodology section, the analysis assumed the maximum amount of SF_6 per circuit breaker and depending on the circuit breaker actually used, SF_6 content may be substantially less than assumed in the analysis. Therefore, GHG emissions reported for the project are conservative.

Impact GHG-2 Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

Currently, there are no federal, state, or local climate change or GHG emissions regulations that address the GHG emissions during project construction. There are a number of federal, state, and local plans and policies and GHG emissions reduction strategies that are potentially applicable to the project operation, either directly or indirectly. The project operation is consistent with the following:

- The project would be consistent with the AB 32 scoping plan strategies to increase the total amount of renewable energy sources consistent with the goal of the state's RPS.
- The project would be consistent with CARB's emission reduction strategy presented in the Scoping Plans (2022 and 2008). The 2008 Scoping Plan specifically addresses critical measures directed at emission sources that are included in the cap-and-trade program that are designed to achieve cost-effective emissions reductions while accelerating the necessary transition to the low-carbon economy.
- The project would be consistent with the San Bernardino County Policy Plan and GHG Plan.
- The project implementation would help California meet its RPS requirements.

The project would help promote California's GHG policies by creating renewable energy resources and would not exceed applicable GHG screening levels shown in Table 11. Therefore, the project would not conflict with an applicable plan, policy, or regulation adopted to reduce GHG emissions. Moreover, projects that are consistent with applicable plan, policy, or regulation adopted to reduce GHG emissions are considered less than significant during construction, operation, and reclamation. Furthermore, GHG emissions from the project, as shown in Appendix A, would not generate substantial GHG emissions during construction or operation. Therefore, impacts would be less than significant.

7.3 Cumulative Impacts

7.3.1 Air Quality

MDAQMD relies on SCAQMD guidance for determining cumulative impacts. SCAQMD has recognized that there is typically insufficient information to quantitatively evaluate the cumulative contributions of multiple projects because each project applicant has no control over nearby projects. SCAQMD published a report on how to address cumulative impacts from air pollution: *White Paper on Potential Control Strategies to Address Cumulative Impacts from Air Pollution* (SCAQMD 2003b). In this report the AQMD clearly states (Page D-3):

> …the AQMD uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or EIR. The only case where the significance thresholds for project specific and cumulative impacts differ is the Hazard Index (HI) significance threshold for toxic air contaminant

(TAC) emissions. The project specific (project increment) significance threshold is HI > 1.0 while the cumulative (facility-wide) is HI > 3.0. It should be noted that the HI is only one of three TAC emission significance thresholds considered (when applicable) in a CEQA analysis. The other two are the maximum individual cancer risk (MICR) and the cancer burden, both of which use the same significance thresholds (MICR of 10 in 1 million and cancer burden of 0.5) for project specific and cumulative impacts.

Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant (SCAQMD 2003b).

Individual projects that do not generate operational or construction emissions that exceed MDAQMD's recommended daily thresholds for project-specific impacts would also not cause a cumulatively considerable increase in emissions for those pollutants for which the MDAB is in nonattainment, and, therefore, would not be considered to have a significant, adverse air quality impact. The project would also not exceed the General Conformity de minimis thresholds for any pollutants in nonattainment. As previously noted, the project construction-source and operational-source air pollutant emissions would not exceed applicable MDAQMD regional thresholds. However, the project would incorporate APMs AIR-1 through AIR-9 and MDAQMD (Rule 403.2) requirements to further reduce potential emissions. A cumulative air quality modeling impacts analysis is not needed since the project does not have any emissive stationary sources that would be combined with other stationary emissions sources within a 6-mile radius that have received construction permits but are not yet operational or are in the permitting process. As such, project construction and operational-source emissions are considered less than significant.

7.3.2 Greenhouse Gas Emissions

The analysis of a project's GHG emissions is inherently a cumulative impacts analysis because climate change is a global problem and the emissions from any single project alone would be negligible. Accordingly, the analysis above considers the potential for the project to contribute to the cumulative impact of global climate change. Table 13 and Table 14 show the estimated annual project-generated GHG emissions as a result of project construction and operation. Given that the project would displace GHG emissions during operations, would generate construction and operation GHG emissions that are below the MDAQMD threshold, that would not conflict with applicable reduction plans and policies; and given that GHG emission impacts are cumulative in nature, the project's incremental contribution to cumulatively significant GHG emissions would be less than significant.

7.4 Air Quality Construction Management Plan

In compliance with MDAQMD requirements, an Air Quality Construction Management Plan would be implemented during construction of the project. No less than 60 days prior to the start of construction, the project applicant would prepare and submit an Air Quality Construction Management Plan to MDAQMD. The plan would describe the fugitive dust control measures that would be implemented and monitored at all locations of proposed facility construction. This plan shall comply with the control measures described in the Fugitive Dust Control Rules enforced by MDAQMD (Rule 403.2). The plan shall be incorporated into all contracts and contract specifications for construction work. The plan shall outline the steps to be taken to minimize fugitive dust generated by construction activities by:

- Obtaining and maintaining a district-approved Dust Control Plan as set forth by MDAQMD Section 403.2(D);
- Using periodic watering for short-term stabilization of the disturbed surface area to minimize visible fugitive dust emissions. For the purposes of this Rule, use of a water truck to maintain moist disturbed surfaces and actively spread water during visible dusting episodes shall be considered sufficient to maintain compliance;
- Taking actions sufficient to prevent project-related trackout onto paved surfaces;
- Covering loaded haul vehicles while operating on publicly maintained paved surfaces;
- Stabilizing graded site surfaces upon completion of grading when subsequent development is delayed or expected to be delayed more than thirty days, except when such delay is due to precipitation that dampens the disturbed surface sufficiently to eliminate visible fugitive dust emissions;
- Cleaning up project-related trackout or spills on publicly maintained paved surfaces within 24 hours;
- Reducing non-essential earth-moving activity under high wind conditions. For purposes of this Rule, a reduction in earth-moving activity when visible dusting occurs from moist and dry surfaces due to wind erosion shall be considered sufficient to maintain compliance;
- Maintaining the natural topography to the extent possible during grading and other earth movement;
- Providing a construction schedule that specifies construction of parking lots and paved roads first, where feasible, and upwind structures prior to downwind structures;
- Covering or otherwise containing bulk material carried on haul trucks operating on paved roads; and
- Removing bulk material tracked onto paved road surfaces.

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APPENDIX A

CalEEMod Results – Air Pollutant and GHG Emission Calculations

Soda Mountain Solar V4 Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

1.2. Land Use Types

1.3. User-Selected Emission Reduction Measures by Emissions Sector

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

2.2. Construction Emissions by Year, Unmitigated

2.4. Operations Emissions Compared Against Thresholds

2.5. Operations Emissions by Sector, Unmitigated

3. Construction Emissions Details

3.1. Stage 1 (2026) - Unmitigated

3.3. Stage 2 (2026) - Unmitigated

3.5. Stage 3 (2026) - Unmitigated

3.7. Stage 3 (2027) - Unmitigated

3.9. Stage 3 - Phase 2 (2027) - Unmitigated

3.11. Stage 2 - Phase 2 (2026) - Unmitigated

3.13. Stage 2 - Phase 2 (2027) - Unmitigated

3.15. Stage 4 - Phase 2 (2027) - Unmitigated

3.17. Stage 4 (2027) - Unmitigated

3.19. Paving (2026) - Unmitigated

3.21. Architectural Coating (2026) - Unmitigated

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

4.3. Area Emissions by Source

4.3.1. Unmitigated

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

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

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

5. Activity Data

5.1. Construction Schedule

5.2. Off-Road Equipment

5.2.1. Unmitigated

5.3. Construction Vehicles

5.3.1. Unmitigated

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

5.5. Architectural Coatings

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

5.6.2. Construction Earthmoving Control Strategies

5.7. Construction Paving

5.8. Construction Electricity Consumption and Emissions Factors

5.9. Operational Mobile Sources

5.9.1. Unmitigated

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.2. Architectural Coatings

5.10.3. Landscape Equipment

5.11. Operational Energy Consumption

5.11.1. Unmitigated

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

5.13. Operational Waste Generation

5.13.1. Unmitigated

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

5.16.2. Process Boilers

5.17. User Defined

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

5.18.2. Sequestration

5.18.2.1. Unmitigated

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

6.2. Initial Climate Risk Scores

6.3. Adjusted Climate Risk Scores

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

7.2. Healthy Places Index Scores

7.3. Overall Health & Equity Scores

7.4. Health & Equity Measures

7.5. Evaluation Scorecard

7.6. Health & Equity Custom Measures

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Soda Mountain Solar V4
Construction Start Date	3/1/2026
Operational Year	2026
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	5.00
Precipitation (days)	8.20
Location	35.1450754767025, -116.18597442305969
County	San Bernardino-Mojave Desert
City	Unincorporated
Air District	Mojave Desert AQMD
Air Basin	Mojave Desert
TAZ	5139
EDFZ	10
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.29

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
User Defined Industrial	2,700	User Defined Unit	2,700	0.00	0.00	0.00	—	—

Parking Lot	0.33	Acre	0.33	0.00	0.00	0.00	—	—
Unrefrigerated Warehouse-No Rail	5.00	1000sqft	0.11	5,000	0.00	0.00	—	—
Unrefrigerated Warehouse-No Rail	2.40	1000sqft	0.06	2,400	0.00	0.00	—	—
General Light Industry	5.00	1000sqft	0.11	5,000	0.00	0.00	—	—
General Heavy Industry	140	1000sqft	3.21	140,000	0.00	0.00	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

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

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	19.0	16.1	129	191	0.37	4.29	26.8	31.1	3.98	7.85	11.8	—	55,476	55,476	1.34	4.00	89.4	56,792
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	17.3	14.6	125	159	0.36	4.08	26.8	30.9	3.79	7.85	11.6	—	53,077	53,077	0.94	3.99	2.32	54,294
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	8.58	7.25	62.3	83.7	0.19	1.97	14.9	16.9	1.83	4.26	6.10	—	29,414	29,414	0.47	2.37	23.1	30,155
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.57	1.32	11.4	15.3	0.03	0.36	2.72	3.08	0.33	0.78	1.11	—	4,870	4,870	0.08	0.39	3.82	4,993

2.2. Construction Emissions by Year, Unmitigated

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

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	19.0	16.1	129	191	0.37	4.29	26.8	31.1	3.98	7.85	11.8	—	55,476	55,476	1.34	4.00	89.4	56,792
2027	5.79	5.03	38.8	86.7	0.19	0.88	18.9	19.8	0.84	4.41	5.25	—	38,626	38,626	0.30	3.85	81.7	39,862
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	17.3	14.6	125	159	0.36	4.08	26.8	30.9	3.79	7.85	11.6	—	53,077	53,077	0.94	3.99	2.32	54,294
2027	14.8	12.5	107	141	0.33	3.15	20.0	23.2	2.93	4.52	7.46	—	49,643	49,643	0.83	3.97	2.11	50,850
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	8.58	7.25	62.3	83.7	0.19	1.97	14.9	16.9	1.83	4.26	6.10	—	29,414	29,414	0.47	2.37	23.1	30,155
2027	3.43	2.92	25.3	39.3	0.10	0.62	9.10	9.72	0.59	2.11	2.69	—	18,666	18,666	0.19	1.85	16.8	19,240
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	1.57	1.32	11.4	15.3	0.03	0.36	2.72	3.08	0.33	0.78	1.11	—	4,870	4,870	0.08	0.39	3.82	4,993
2027	0.63	0.53	4.62	7.17	0.02	0.11	1.66	1.77	0.11	0.38	0.49	—	3,090	3,090	0.03	0.31	2.79	3,185

2.4. Operations Emissions Compared Against Thresholds

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

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.42	1.28	5.29	9.12	0.09	0.09	2.83	2.93	0.09	0.74	0.83	7.55	9,933	9,940	0.80	1.07	29.2	10,309
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Unmit.	0.24	0.18	5.54	2.48	0.09	0.08	2.83	2.91	0.08	0.74	0.82	7.55	9,906	9,914	0.80	1.08	1.77	10,256
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.75	0.67	4.04	5.03	0.07	0.06	2.01	2.08	0.06	0.53	0.59	7.55	7,144	7,152	0.80	0.77	9.72	7,411
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.14	0.12	0.74	0.92	0.01	0.01	0.37	0.38	0.01	0.10	0.11	1.25	1,183	1,184	0.13	0.13	1.61	1,227

2.5. Operations Emissions by Sector, Unmitigated

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

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.25	0.19	5.24	2.49	0.09	0.08	2.83	2.91	0.08	0.74	0.82	—	9,711	9,711	0.03	1.07	28.1	10,057
Area	1.18	1.09	0.06	6.63	< 0.005	0.01	—	0.01	0.01	—	0.01	—	27.3	27.3	< 0.005	< 0.005	—	27.4
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	144	144	0.01	< 0.005	—	145
Water	—	—	—	—	—	—	—	—	—	—	—	2.22	50.0	52.2	0.23	0.01	—	59.7
Waste	—	—	—	—	—	—	—	—	—	—	—	5.34	0.00	5.34	0.53	0.00	—	18.7
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.04	1.04
Total	1.42	1.28	5.29	9.12	0.09	0.09	2.83	2.93	0.09	0.74	0.83	7.55	9,933	9,940	0.80	1.07	29.2	10,309
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.24	0.18	5.54	2.48	0.09	0.08	2.83	2.91	0.08	0.74	0.82	—	9,712	9,712	0.03	1.07	0.73	10,032
Area	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	144	144	0.01	< 0.005	—	145
Water	—	—	—	—	—	—	—	—	—	—	—	2.22	50.0	52.2	0.23	0.01	—	59.7
Waste	—	—	—	—	—	—	—	—	—	—	—	5.34	0.00	5.34	0.53	0.00	—	18.7
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.04	1.04

Total	0.24	0.18	5.54	2.48	0.09	0.08	2.83	2.91	0.08	0.74	0.82	7.55	9,906	9,914	0.80	1.08	1.77	10,256
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.17	0.13	4.02	1.76	0.07	0.06	2.01	2.07	0.06	0.53	0.58	—	6,937	6,937	0.02	0.76	8.68	7,173
Area	0.58	0.54	0.03	3.27	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	—	13.4	13.4	< 0.005	< 0.005	—	13.5
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	144	144	0.01	< 0.005	—	145
Water	—	—	—	—	—	—	—	—	—	—	—	2.22	50.0	52.2	0.23	0.01	—	59.7
Waste	—	—	—	—	—	—	—	—	—	—	—	5.34	0.00	5.34	0.53	0.00	—	18.7
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.04	1.04
Total	0.75	0.67	4.04	5.03	0.07	0.06	2.01	2.08	0.06	0.53	0.59	7.55	7,144	7,152	0.80	0.77	9.72	7,411
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.03	0.02	0.73	0.32	0.01	0.01	0.37	0.38	0.01	0.10	0.11	—	1,148	1,148	< 0.005	0.13	1.44	1,188
Area	0.11	0.10	0.01	0.60	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.23	2.23	< 0.005	< 0.005	—	2.23
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	23.9	23.9	< 0.005	< 0.005	—	24.0
Water	—	—	—	—	—	—	—	—	—	—	—	0.37	8.27	8.64	0.04	< 0.005	—	9.88
Waste	—	—	—	—	—	—	—	—	—	—	—	0.88	0.00	0.88	0.09	0.00	—	3.09
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.17	0.17
Total	0.14	0.12	0.74	0.92	0.01	0.01	0.37	0.38	0.01	0.10	0.11	1.25	1,183	1,184	0.13	0.13	1.61	1,227

3. Construction Emissions Details

3.1. Stage 1 (2026) - Unmitigated

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

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

Off-Road	4.72	3.96	34.2	37.2	0.07	1.45	—	1.45	1.33	—	1.33	—	7,539	7,539	0.31	0.06	—	7,565
Dust From Material Movement	—	—	—	—	—	—	6.78	6.78	—	3.33	3.33	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.06	0.04	< 0.005	< 0.005	1.11	1.11	< 0.005	0.11	0.11	—	16.3	16.3	< 0.005	< 0.005	0.02	17.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.72	3.96	34.2	37.2	0.07	1.45	—	1.45	1.33	—	1.33	—	7,539	7,539	0.31	0.06	—	7,565
Dust From Material Movement	—	—	—	—	—	—	6.78	6.78	—	3.33	3.33	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.06	0.05	< 0.005	< 0.005	1.11	1.11	< 0.005	0.11	0.11	—	16.4	16.4	< 0.005	< 0.005	< 0.005	17.2
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.26	1.90	16.4	17.9	0.03	0.69	—	0.69	0.64	—	0.64	—	3,615	3,615	0.15	0.03	—	3,627
Dust From Material Movement	—	—	—	—	—	—	3.25	3.25	—	1.60	1.60	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.03	0.02	< 0.005	< 0.005	0.52	0.52	< 0.005	0.05	0.05	—	7.83	7.83	< 0.005	< 0.005	< 0.005	8.21
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.41	0.35	3.00	3.26	0.01	0.13	—	0.13	0.12	—	0.12	—	598	598	0.02	< 0.005	—	600

Dust From Material Movement	—	—	—	—	—	—	0.59	0.59	—	0.29	0.29	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.10	0.10	< 0.005	0.01	0.01	—	1.30	1.30	< 0.005	< 0.005	< 0.005	1.36
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.55	3.12	3.77	67.5	0.00	0.00	11.9	11.9	0.00	2.78	2.78	—	12,930	12,930	0.48	0.42	44.0	13,112
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.43	0.39	22.8	4.12	0.15	0.43	5.93	6.36	0.43	1.52	1.95	—	21,671	21,671	0.02	3.40	45.4	22,732
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.23	2.79	4.17	43.7	0.00	0.00	11.9	11.9	0.00	2.78	2.78	—	11,442	11,442	0.12	0.42	1.14	11,572
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.39	0.36	24.2	4.23	0.15	0.43	5.93	6.36	0.43	1.52	1.95	—	21,687	21,687	0.02	3.40	1.18	22,703
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.56	1.36	2.18	23.7	0.00	0.00	5.66	5.66	0.00	1.33	1.33	—	5,648	5,648	0.06	0.20	9.09	5,719
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.20	0.18	11.6	2.00	0.07	0.21	2.83	3.04	0.21	0.73	0.93	—	10,394	10,394	0.01	1.63	9.40	10,890
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.28	0.25	0.40	4.33	0.00	0.00	1.03	1.03	0.00	0.24	0.24	—	935	935	0.01	0.03	1.51	947
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.04	0.03	2.12	0.36	0.01	0.04	0.52	0.55	0.04	0.13	0.17	—	1,721	1,721	< 0.005	0.27	1.56	1,803

3.3. Stage 2 (2026) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	8.97	7.46	62.5	74.3	0.13	2.20	—	2.20	2.02	—	2.02	—	12,377	12,377	0.50	0.10	—	12,419
Onsite truck	< 0.005	< 0.005	0.06	0.04	< 0.005	< 0.005	1.11	1.11	< 0.005	0.11	0.11	—	16.3	16.3	< 0.005	< 0.005	0.02	17.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	8.97	7.46	62.5	74.3	0.13	2.20	—	2.20	2.02	—	2.02	—	12,377	12,377	0.50	0.10	—	12,419
Onsite truck	< 0.005	< 0.005	0.06	0.05	< 0.005	< 0.005	1.11	1.11	< 0.005	0.11	0.11	—	16.4	16.4	< 0.005	< 0.005	< 0.005	17.2
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.70	2.25	18.8	22.4	0.04	0.66	—	0.66	0.61	—	0.61	—	3,730	3,730	0.15	0.03	—	3,743
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.33	0.33	< 0.005	0.03	0.03	—	4.92	4.92	< 0.005	< 0.005	< 0.005	5.16
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.49	0.41	3.44	4.08	0.01	0.12	—	0.12	0.11	—	0.11	—	618	618	0.03	0.01	—	620
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	—	0.81	0.81	< 0.005	< 0.005	< 0.005	0.85
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Stage 3 (2026) - Unmitigated

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

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

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.70	0.59	5.91	9.42	0.01	0.22	—	0.22	0.21	—	0.21	—	1,418	1,418	0.06	0.01	—	1,423
Onsite truck	< 0.005	< 0.005	0.06	0.05	< 0.005	< 0.005	1.11	1.11	< 0.005	0.11	0.11	—	16.4	16.4	< 0.005	< 0.005	< 0.005	17.2
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.04	0.36	0.57	< 0.005	0.01	—	0.01	0.01	—	0.01	—	86.0	86.0	< 0.005	< 0.005	—	86.3
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.07	0.07	< 0.005	0.01	0.01	—	0.99	0.99	< 0.005	< 0.005	< 0.005	1.04
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.07	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	14.2	14.2	< 0.005	< 0.005	—	14.3
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.16	0.16	< 0.005	< 0.005	< 0.005	0.17
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Stage 3 (2027) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.66	0.56	5.60	9.41	0.01	0.19	—	0.19	0.18	—	0.18	—	1,418	1,418	0.06	0.01	—	1,423
Onsite truck	< 0.005	< 0.005	0.06	0.05	< 0.005	< 0.005	1.11	1.11	< 0.005	0.11	0.11	—	16.1	16.1	< 0.005	< 0.005	< 0.005	16.9
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.06	0.65	1.09	< 0.005	0.02	—	0.02	0.02	—	0.02	—	164	164	0.01	< 0.005	—	164
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.13	0.13	< 0.005	0.01	0.01	—	1.84	1.84	< 0.005	< 0.005	< 0.005	1.93
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Roa Equipment	0.01	0.01	0.12	0.20	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	27.1	27.1	< 0.005	< 0.005	—	27.2
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	0.31	0.31	< 0.005	< 0.005	< 0.005	0.32
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Stage 3 - Phase 2 (2027) - Unmitigated

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

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

Off-Roa Equipment	1.33	1.11	8.64	13.1	0.03	0.30	—	0.30	0.27	—	0.27	—	3,084	3,084	0.13	0.03	—	3,095
Onsite truck	< 0.005	< 0.005	0.06	0.04	< 0.005	< 0.005	1.11	1.11	< 0.005	0.11	0.11	—	15.9	15.9	< 0.005	< 0.005	0.02	16.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Roa d Equipm ent	1.33	1.11	8.64	13.1	0.03	0.30	—	0.30	0.27	—	0.27	—	3,084	3,084	0.13	0.03	—	3,095
Onsite truck	< 0.005	< 0.005	0.06	0.05	< 0.005	< 0.005	1.11	1.11	< 0.005	0.11	0.11	—	16.1	16.1	< 0.005	< 0.005	< 0.005	16.9
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Roa d Equipm ent	0.32	0.27	2.08	3.16	0.01	0.07	—	0.07	0.07	—	0.07	—	744	744	0.03	0.01	—	746
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.26	0.26	< 0.005	0.03	0.03	—	3.85	3.85	< 0.005	< 0.005	< 0.005	4.04
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Roa d Equipm ent	0.06	0.05	0.38	0.58	< 0.005	0.01	—	0.01	0.01	—	0.01	—	123	123	< 0.005	< 0.005	—	124
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.05	0.05	< 0.005	< 0.005	< 0.005	—	0.64	0.64	< 0.005	< 0.005	< 0.005	0.67
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.39	2.98	3.37	62.4	0.00	0.00	11.9	11.9	0.00	2.78	2.78	—	12,708	12,708	0.09	0.41	39.7	12,872
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.43	0.39	22.4	3.97	0.15	0.43	5.93	6.36	0.43	1.52	1.95	—	21,163	21,163	0.02	3.40	41.9	22,219

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.12	2.70	3.77	40.7	0.00	0.00	11.9	11.9	0.00	2.78	2.78	—	11,248	11,248	0.12	0.42	1.03	11,378
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.39	0.36	23.6	4.08	0.15	0.43	5.93	6.36	0.43	1.52	1.95	—	21,179	21,179	0.02	3.40	1.09	22,195
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.75	0.65	1.00	11.0	0.00	0.00	2.85	2.85	0.00	0.67	0.67	—	2,792	2,792	0.03	0.10	4.14	2,827
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.10	0.09	5.70	0.97	0.04	0.10	1.42	1.53	0.10	0.36	0.47	—	5,104	5,104	< 0.005	0.82	4.36	5,353
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.14	0.12	0.18	2.01	0.00	0.00	0.52	0.52	0.00	0.12	0.12	—	462	462	< 0.005	0.02	0.68	468
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	0.02	1.04	0.18	0.01	0.02	0.26	0.28	0.02	0.07	0.09	—	845	845	< 0.005	0.14	0.72	886

3.11. Stage 2 - Phase 2 (2026) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	11.0	9.16	76.1	86.8	0.17	2.77	—	2.77	2.55	—	2.55	—	15,767	15,767	0.64	0.13	—	15,821
Onsite truck	< 0.005	< 0.005	0.06	0.05	< 0.005	< 0.005	1.11	1.11	< 0.005	0.11	0.11	—	16.4	16.4	< 0.005	< 0.005	< 0.005	17.2

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.31	1.09	9.09	10.4	0.02	0.33	—	0.33	0.30	—	0.30	—	1,882	1,882	0.08	0.02	—	1,889
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.13	0.13	< 0.005	0.01	0.01	—	1.95	1.95	< 0.005	< 0.005	< 0.005	2.04
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.24	0.20	1.66	1.89	< 0.005	0.06	—	0.06	0.06	—	0.06	—	312	312	0.01	< 0.005	—	313
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	0.32	0.32	< 0.005	< 0.005	< 0.005	0.34
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.23	2.79	4.17	43.7	0.00	0.00	11.9	11.9	0.00	2.78	2.78	—	11,442	11,442	0.12	0.42	1.14	11,572
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.39	0.36	24.2	4.23	0.15	0.43	5.93	6.36	0.43	1.52	1.95	—	21,687	21,687	0.02	3.40	1.18	22,703
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.39	0.34	0.54	5.90	0.00	0.00	1.41	1.41	0.00	0.33	0.33	—	1,406	1,406	0.02	0.05	2.26	1,424
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.05	0.04	2.90	0.50	0.02	0.05	0.70	0.76	0.05	0.18	0.23	—	2,588	2,588	< 0.005	0.41	2.34	2,711
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.10	1.08	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	233	233	< 0.005	0.01	0.37	236
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.01	0.53	0.09	< 0.005	0.01	0.13	0.14	0.01	0.03	0.04	—	428	428	< 0.005	0.07	0.39	449

3.13. Stage 2 - Phase 2 (2027) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	10.6	8.84	73.6	86.3	0.17	2.53	—	2.53	2.32	—	2.32	—	15,766	15,766	0.64	0.13	—	15,820
Onsite truck	< 0.005	< 0.005	0.06	0.05	< 0.005	< 0.005	1.11	1.11	< 0.005	0.11	0.11	—	16.1	16.1	< 0.005	< 0.005	< 0.005	16.9
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.22	1.02	8.49	9.97	0.02	0.29	—	0.29	0.27	—	0.27	—	1,820	1,820	0.07	0.01	—	1,827
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.13	0.13	< 0.005	0.01	0.01	—	1.84	1.84	< 0.005	< 0.005	< 0.005	1.93
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.22	0.19	1.55	1.82	< 0.005	0.05	—	0.05	0.05	—	0.05	—	301	301	0.01	< 0.005	—	302
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	0.31	0.31	< 0.005	< 0.005	< 0.005	0.32
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.12	2.70	3.77	40.7	0.00	0.00	11.9	11.9	0.00	2.78	2.78	—	11,248	11,248	0.12	0.42	1.03	11,378
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.39	0.36	23.6	4.08	0.15	0.43	5.93	6.36	0.43	1.52	1.95	—	21,179	21,179	0.02	3.40	1.09	22,195
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.36	0.31	0.48	5.28	0.00	0.00	1.36	1.36	0.00	0.32	0.32	—	1,337	1,337	0.01	0.05	1.98	1,354
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.05	0.04	2.73	0.46	0.02	0.05	0.68	0.73	0.05	0.17	0.22	—	2,444	2,444	< 0.005	0.39	2.09	2,564
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.09	0.96	0.00	0.00	0.25	0.25	0.00	0.06	0.06	—	221	221	< 0.005	0.01	0.33	224
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.01	0.50	0.08	< 0.005	0.01	0.12	0.13	0.01	0.03	0.04	—	405	405	< 0.005	0.07	0.35	424

3.15. Stage 4 - Phase 2 (2027) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.66	0.56	4.55	7.41	0.02	0.15	—	0.15	0.14	—	0.14	—	1,693	1,693	0.07	0.01	—	1,699
Onsite truck	< 0.005	< 0.005	0.06	0.04	< 0.005	< 0.005	1.11	1.11	< 0.005	0.11	0.11	—	15.9	15.9	< 0.005	< 0.005	0.02	16.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.55	0.89	< 0.005	0.02	—	0.02	0.02	—	0.02	—	204	204	0.01	< 0.005	—	205
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.13	0.13	< 0.005	0.01	0.01	—	1.93	1.93	< 0.005	< 0.005	< 0.005	2.02
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.10	0.16	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	33.8	33.8	< 0.005	< 0.005	—	33.9
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	0.32	0.32	< 0.005	< 0.005	< 0.005	0.33
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.39	2.98	3.37	62.4	0.00	0.00	11.9	11.9	0.00	2.78	2.78	—	12,708	12,708	0.09	0.41	39.7	12,872
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.43	0.39	22.4	3.97	0.15	0.43	5.93	6.36	0.43	1.52	1.95	—	21,163	21,163	0.02	3.40	41.9	22,219
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.38	0.33	0.50	5.51	0.00	0.00	1.42	1.42	0.00	0.33	0.33	—	1,396	1,396	0.01	0.05	2.07	1,414
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.05	0.05	2.85	0.48	0.02	0.05	0.71	0.76	0.05	0.18	0.23	—	2,552	2,552	< 0.005	0.41	2.18	2,677
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.09	1.01	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	231	231	< 0.005	0.01	0.34	234
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.01	0.52	0.09	< 0.005	0.01	0.13	0.14	0.01	0.03	0.04	—	423	423	< 0.005	0.07	0.36	443

3.17. Stage 4 (2027) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.54	4.40	7.16	0.02	0.14	—	0.14	0.13	—	0.13	—	1,655	1,655	0.07	0.01	—	1,660
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.03	0.26	0.43	< 0.005	0.01	—	0.01	0.01	—	0.01	—	99.7	99.7	< 0.005	< 0.005	—	100
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.05	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	16.5	16.5	< 0.005	< 0.005	—	16.6
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.19. Paving (2026) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.66	0.55	4.66	6.35	0.01	0.21	—	0.21	0.19	—	0.19	—	927	927	0.04	0.01	—	930
Paving	0.09	0.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.13	0.17	< 0.005	0.01	—	0.01	0.01	—	0.01	—	25.4	25.4	< 0.005	< 0.005	—	25.5
Paving	< 0.005	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.20	4.20	< 0.005	< 0.005	—	4.22
Paving	< 0.005	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.21. Architectural Coating (2026) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.97	0.80	5.71	7.55	0.01	0.15	—	0.15	0.14	—	0.14	—	890	890	0.04	0.01	—	893
Architectural Coatings	0.40	0.40	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.16	0.21	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	24.4	24.4	< 0.005	< 0.005	—	24.5

Architectural Coating	0.01	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.04	4.04	< 0.005	< 0.005	—	4.05
Architectural Coatings	< 0.005	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Industrial	0.25	0.19	5.24	2.49	0.09	0.08	2.83	2.91	0.08	0.74	0.82	—	9,711	9,711	0.03	1.07	28.1	10,057
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Unrefrigerated Warehouse-No Rail	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.25	0.19	5.24	2.49	0.09	0.08	2.83	2.91	0.08	0.74	0.82	—	9,711	9,711	0.03	1.07	28.1	10,057
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

User Defined Industrial	0.24	0.18	5.54	2.48	0.09	0.08	2.83	2.91	0.08	0.74	0.82	—	9,712	9,712	0.03	1.07	0.73	10,032
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Unrefrigerated Warehouse-No Rail	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.24	0.18	5.54	2.48	0.09	0.08	2.83	2.91	0.08	0.74	0.82	—	9,712	9,712	0.03	1.07	0.73	10,032
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Industrial	0.03	0.02	0.73	0.32	0.01	0.01	0.37	0.38	0.01	0.10	0.11	—	1,148	1,148	< 0.005	0.13	1.44	1,188
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Unrefrigerated Warehouse-No Rail	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.03	0.02	0.73	0.32	0.01	0.01	0.37	0.38	0.01	0.10	0.11	—	1,148	1,148	< 0.005	0.13	1.44	1,188

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Industrial	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	18.4	18.4	< 0.005	< 0.005	—	18.4
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	—	—	56.5	56.5	< 0.005	< 0.005	—	56.8
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	69.5	69.5	< 0.005	< 0.005	—	69.8
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	144	144	0.01	< 0.005	—	145
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Industrial	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	18.4	18.4	< 0.005	< 0.005	—	18.4

Unrefrigerated Wareho Rail	—	—	—	—	—	—	—	—	—	—	—	—	56.5	56.5	< 0.005	< 0.005	—	56.8
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	69.5	69.5	< 0.005	< 0.005	—	69.8
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	144	144	0.01	< 0.005	—	145
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Industrial	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	3.04	3.04	< 0.005	< 0.005	—	3.05
Unrefrigerated Wareho use-No Rail	—	—	—	—	—	—	—	—	—	—	—	—	9.36	9.36	< 0.005	< 0.005	—	9.40
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	11.5	11.5	< 0.005	< 0.005	—	11.6
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	23.9	23.9	< 0.005	< 0.005	—	24.0

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

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

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

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Industrial	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Unrefrigerated Warehouse-No Rail	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Industrial	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Unrefrigerated Warehouse-No Rail	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Industrial	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Unrefrigerated Warehouse-No Rail	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.3. Area Emissions by Source

4.3.1. Unmitigated

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

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architect Coatings	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landsca pe Equipm ent	1.18	1.09	0.06	6.63	< 0.005	0.01	—	0.01	0.01	—	0.01	—	27.3	27.3	< 0.005	< 0.005	—	27.4
Total	1.18	1.09	0.06	6.63	< 0.005	0.01	—	0.01	0.01	—	0.01	—	27.3	27.3	< 0.005	< 0.005	—	27.4
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consum er Product s	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architect ural Coating s	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consum er Product s	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architect ural Coating s	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landsca pe Equipm ent	0.11	0.10	0.01	0.60	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.23	2.23	< 0.005	< 0.005	—	2.23
Total	0.11	0.10	0.01	0.60	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.23	2.23	< 0.005	< 0.005	—	2.23

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Industrial	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	2.22	50.0	52.2	0.23	0.01	—	59.7
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	2.22	50.0	52.2	0.23	0.01	—	59.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Industrial	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	2.22	50.0	52.2	0.23	0.01	—	59.7
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	2.22	50.0	52.2	0.23	0.01	—	59.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Industrial	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	0.37	8.27	8.64	0.04	< 0.005	—	9.88
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.37	8.27	8.64	0.04	< 0.005	—	9.88

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Industrial	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	—	1.99	0.00	1.99	0.20	0.00	—	6.98
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	3.34	0.00	3.34	0.33	0.00	—	11.7
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	5.34	0.00	5.34	0.53	0.00	—	18.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Industrial	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	—	1.99	0.00	1.99	0.20	0.00	—	6.98
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	3.34	0.00	3.34	0.33	0.00	—	11.7

General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	5.34	0.00	5.34	0.53	0.00	—	18.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Industrial	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.16
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	0.55	0.00	0.55	0.06	0.00	—	1.94
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.88	0.00	0.88	0.09	0.00	—	3.09

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.42	0.42

Unrefrig Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.62	0.62
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.04	1.04
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.42	0.42
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.62	0.62
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.04	1.04
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.10	0.10
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.17	0.17

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

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

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

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

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

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

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

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

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

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

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

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

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

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

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

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

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

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

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Stage 1	Site Preparation	3/1/2026	10/31/2026	5.00	175	—
Stage 2	Building Construction	6/1/2026	10/31/2026	5.00	110	—
Stage 3	Building Construction	12/1/2026	2/28/2027	5.00	64.0	—

Stage 3 - Phase 2	Building Construction	3/1/2027	6/30/2027	5.00	88.0	—
Stage 2 - Phase 2	Building Construction	11/1/2026	2/28/2027	5.00	85.0	—
Stage 4 - Phase 2	Building Construction	7/1/2027	8/31/2027	5.00	44.0	—
Stage 4	Building Construction	6/1/2027	6/30/2027	5.00	22.0	—
Paving	Paving	6/17/2026	6/30/2026	5.00	10.0	—
Architectural Coating	Architectural Coating	7/1/2026	7/14/2026	5.00	10.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Stage 1	Rubber Tired Dozers	Diesel	Average	2.00	10.0	367	0.40
Stage 1	Tractors/Loaders/Backhoes	Diesel	Average	4.00	10.0	84.0	0.37
Stage 1	Excavators	Diesel	Average	1.00	10.0	36.0	0.38
Stage 1	Graders	Diesel	Average	1.00	10.0	148	0.41
Stage 1	Off-Highway Trucks	Diesel	Average	1.00	10.0	376	0.38
Stage 1	Plate Compactors	Diesel	Average	2.00	10.0	8.00	0.43
Stage 2	Cranes	Diesel	Average	2.00	10.0	367	0.29
Stage 2	Forklifts	Diesel	Average	5.00	10.0	82.0	0.20
Stage 2	Generator Sets	Diesel	Average	15.0	10.0	14.0	0.74
Stage 2	Tractors/Loaders/Backhoes	Diesel	Average	5.00	10.0	84.0	0.37
Stage 2	Welders	Diesel	Average	12.0	10.0	46.0	0.45
Stage 2	Trenchers	Diesel	Average	1.00	10.0	40.0	0.50
Stage 2	Bore/Drill Rigs	Diesel	Average	1.00	10.0	83.0	0.50
Stage 2	Rubber Tired Loaders	Diesel	Average	1.00	10.0	150	0.36
Stage 2	Excavators	Diesel	Average	4.00	10.0	36.0	0.38
Stage 3	Forklifts	Diesel	Average	3.00	10.0	82.0	0.20

Stage 3	Tractors/Loaders/Back	Diesel	Average	1.00	10.0	84.0	0.37
Stage 3	Skid Steer Loaders	Diesel	Average	1.00	10.0	71.0	0.37
Stage 3	Excavators	Diesel	Average	1.00	10.0	36.0	0.38
Stage 3 - Phase 2	Forklifts	Diesel	Average	3.00	10.0	82.0	0.20
Stage 3 - Phase 2	Tractors/Loaders/Back hoes	Diesel	Average	1.00	10.0	84.0	0.37
Stage 3 - Phase 2	Off-Highway Trucks	Diesel	Average	1.00	10.0	376	0.38
Stage 3 - Phase 2	Skid Steer Loaders	Diesel	Average	1.00	10.0	71.0	0.37
Stage 3 - Phase 2	Excavators	Diesel	Average	1.00	10.0	36.0	0.38
Stage 2 - Phase 2	Cranes	Diesel	Average	2.00	10.0	367	0.29
Stage 2 - Phase 2	Forklifts	Diesel	Average	5.00	10.0	82.0	0.20
Stage 2 - Phase 2	Generator Sets	Diesel	Average	15.0	10.0	14.0	0.74
Stage 2 - Phase 2	Tractors/Loaders/Back hoes	Diesel	Average	5.00	10.0	84.0	0.37
Stage 2 - Phase 2	Welders	Diesel	Average	12.0	10.0	46.0	0.45
Stage 2 - Phase 2	Off-Highway Trucks	Diesel	Average	1.00	10.0	376	0.38
Stage 2 - Phase 2	Trenchers	Diesel	Average	1.00	10.0	40.0	0.50
Stage 2 - Phase 2	Bore/Drill Rigs	Diesel	Average	1.00	10.0	83.0	0.50
Stage 2 - Phase 2	Rubber Tired Loaders	Diesel	Average	1.00	10.0	150	0.36
Stage 2 - Phase 2	Excavators	Diesel	Average	4.00	10.0	36.0	0.38
Stage 2 - Phase 2	Rubber Tired Dozers	Diesel	Average	1.00	10.0	367	0.40
Stage 4 - Phase 2	Forklifts	Diesel	Average	1.00	10.0	82.0	0.20
Stage 4 - Phase 2	Off-Highway Trucks	Diesel	Average	1.00	5.00	376	0.38
Stage 4 - Phase 2	Skid Steer Loaders	Diesel	Average	1.00	10.0	71.0	0.37
Stage 4 - Phase 2	Tractors/Loaders/Back hoes	Diesel	Average	1.00	10.0	84.0	0.37
Stage 4	Forklifts	Diesel	Average	1.00	8.00	82.0	0.20
Stage 4	Tractors/Loaders/Back hoes	Diesel	Average	1.00	10.0	84.0	0.37
Stage 4	Off-Highway Trucks	Diesel	Average	1.00	5.00	376	0.38

Stage 4	Skid Steer Loaders	Diesel	Average	1.00	10.0	71.0	0.37
Paving	Pavers	Diesel	Average	1.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	1.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	1.00	8.00	36.0	0.38
Paving	Sweepers/Scrubbers	Diesel	Average	1.00	8.00	36.0	0.46
Architectural Coating	Air Compressors	Diesel	Average	5.00	8.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Stage 1	—	—	—	—
Stage 1	Worker	600	28.0	LDA,LDT1,LDT2
Stage 1	Vendor	0.00	10.2	HHDT,MHDT
Stage 1	Hauling	234	28.0	HHDT
Stage 1	Onsite truck	3.00	1.00	HHDT
Stage 2	—	—	—	—
Stage 2	Worker	0.00	18.5	LDA,LDT1,LDT2
Stage 2	Vendor	0.00	10.2	HHDT,MHDT
Stage 2	Hauling	0.00	20.0	HHDT
Stage 2	Onsite truck	3.00	1.00	HHDT
Paving	—	—	—	—
Paving	Worker	0.00	18.5	LDA,LDT1,LDT2
Paving	Vendor	0.00	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	0.00	0.00	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	0.00	18.5	LDA,LDT1,LDT2

Architectural Coating	Vendor	0.00	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	0.00	0.00	HHDT
Stage 3	—	—	—	—
Stage 3	Worker	0.00	18.5	LDA,LDT1,LDT2
Stage 3	Vendor	0.00	10.2	HHDT,MHDT
Stage 3	Hauling	0.00	20.0	HHDT
Stage 3	Onsite truck	3.00	1.00	HHDT
Stage 3 - Phase 2	—	—	—	—
Stage 3 - Phase 2	Worker	600	28.0	LDA,LDT1,LDT2
Stage 3 - Phase 2	Vendor	0.00	10.2	HHDT,MHDT
Stage 3 - Phase 2	Hauling	234	28.0	HHDT
Stage 3 - Phase 2	Onsite truck	3.00	1.00	HHDT
Stage 2 - Phase 2	—	—	—	—
Stage 2 - Phase 2	Worker	600	28.0	LDA,LDT1,LDT2
Stage 2 - Phase 2	Vendor	0.00	10.2	HHDT,MHDT
Stage 2 - Phase 2	Hauling	234	28.0	HHDT
Stage 2 - Phase 2	Onsite truck	3.00	1.00	HHDT
Stage 4 - Phase 2	—	—	—	—
Stage 4 - Phase 2	Worker	600	28.0	LDA,LDT1,LDT2
Stage 4 - Phase 2	Vendor	0.00	10.2	HHDT,MHDT
Stage 4 - Phase 2	Hauling	234	28.0	HHDT
Stage 4 - Phase 2	Onsite truck	3.00	1.00	HHDT
Stage 4	—	—	—	—
Stage 4	Worker	0.00	18.5	LDA,LDT1,LDT2
Stage 4	Vendor	0.00	10.2	HHDT,MHDT
Stage 4	Hauling	0.00	20.0	HHDT
Stage 4	Onsite truck	0.00	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	0.00	0.00	0.00	0.00	862

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Stage 1	0.00	449,900	2,112	0.00	—
Paving	0.00	0.00	0.00	0.00	3.81

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
User Defined Industrial	0.00	0%

Parking Lot	0.33	100%
Unrefrigerated Warehouse-No Rail	0.11	0%
Unrefrigerated Warehouse-No Rail	0.06	0%
General Light Industry	0.11	0%
General Heavy Industry	3.21	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2026	0.00	532	0.03	< 0.005
2027	0.00	532	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
User Defined Industrial	81.0	0.00	0.00	21,118	3,577	0.00	0.00	932,509
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unrefrigerated Warehouse-No Rail	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unrefrigerated Warehouse-No Rail	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	228,600	76,200	862

5.10.3. Landscape Equipment

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

5.11. Operational Energy Consumption

5.11.1. Unmitigated

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

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
User Defined Industrial	0.00	532	0.0330	0.0040	0.00
Parking Lot	12,592	532	0.0330	0.0040	0.00
Unrefrigerated Warehouse-No Rail	27,712	532	0.0330	0.0040	0.00
Unrefrigerated Warehouse-No Rail	11,085	532	0.0330	0.0040	0.00
General Light Industry	47,689	532	0.0330	0.0040	0.00
General Heavy Industry	0.00	532	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
User Defined Industrial	0.00	0.00
Parking Lot	0.00	0.00
Unrefrigerated Warehouse-No Rail	0.00	0.00
Unrefrigerated Warehouse-No Rail	0.00	0.00
General Light Industry	1,156,250	6,517,029
General Heavy Industry	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
User Defined Industrial	0.00	—
Parking Lot	0.00	—
Unrefrigerated Warehouse-No Rail	2.50	—
Unrefrigerated Warehouse-No Rail	1.20	—
General Light Industry	6.20	—
General Heavy Industry	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Light Industry	Other commercial A/C and heat pumps	User Defined	675	0.30	4.00	4.00	18.0
Unrefrigerated Warehouse-No Rail	Other commercial A/C and heat pumps	User Defined	675	0.30	4.00	4.00	18.0

Unrefrigerated Warehouse-No Rail	Other commercial A/C and heat pumps	User Defined	675	0.30	4.00	4.00	18.0

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

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

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

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

5.16.2. Process Boilers

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

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

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

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

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

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	24.8	annual days of extreme heat
Extreme Precipitation	0.00	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	0.29	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	1	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	0	0	0	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

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

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

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

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

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

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	77.1
AQ-PM	7.45
AQ-DPM	3.61
Drinking Water	87.0
Lead Risk Housing	39.1
Pesticides	39.4
Toxic Releases	2.81
Traffic	13.8
Effect Indicators	—
CleanUp Sites	94.2
Groundwater	92.8
Haz Waste Facilities/Generators	78.8
Impaired Water Bodies	0.00
Solid Waste	99.9
Sensitive Population	—
Asthma	54.8
Cardio-vascular	73.9
Low Birth Weights	99.2
Socioeconomic Factor Indicators	—

Education	54.1
Housing	34.2
Linguistic	38.1
Poverty	76.4
Unemployment	95.3

7.2. Healthy Places Index Scores

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

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	33.78673168
Employed	3.811112537
Median HI	21.35249583
Education	—
Bachelor's or higher	26.78044399
High school enrollment	100
Preschool enrollment	39.0606955
Transportation	—
Auto Access	32.77300141
Active commuting	75.32400873
Social	—
2-parent households	57.35916848
Voting	45.82317464
Neighborhood	—
Alcohol availability	90.37597844
Park access	24.44501476
Retail density	3.387655588
Supermarket access	7.275760298

Tree canopy	0.051328115
Housing	—
Homeownership	62.60746824
Housing habitability	64.36545618
Low-inc homeowner severe housing cost burden	44.92493263
Low-inc renter severe housing cost burden	77.50545361
Uncrowded housing	56.87155139
Health Outcomes	—
Insured adults	15.69357115
Arthritis	0.0
Asthma ER Admissions	37.6
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	7.6
Cognitively Disabled	60.3
Physically Disabled	25.6
Heart Attack ER Admissions	35.8
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	96.1
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—

Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	64.0
Elderly	23.5
English Speaking	39.9
Foreign-born	36.0
Outdoor Workers	55.4
Climate Change Adaptive Capacity	—
Impervious Surface Cover	97.4
Traffic Density	9.6
Traffic Access	23.0
Other Indices	—
Hardship	66.7
Other Decision Support	—
2016 Voting	56.1

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	75.0
Healthy Places Index Score for Project Location (b)	23.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

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

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	2700 acres for total project acreage
Construction: Construction Phases	Projected Schedule
Construction: Dust From Material Movement	2112 acres graded
Construction: Trips and VMT	Trips based on traffic assessment
Construction: Off-Road Equipment	Anticipated equipment
Operations: Vehicle Data	Approximate 80 trips
Operations: Fleet Mix	Assumed to be heavy heavy duty and medium heavy duty
Operations: Consumer Products	none
Operations: Energy Use	electricity from operations building
Operations: Water and Waste Water	Indoor water use for maintenance buildings and conservative 20 afy during operations
Operations: Solid Waste	Waste for O&M building, maintenance facility and warehouse facility
Operations: Refrigerants	AC for O&M building, maintenance facility and warehouse facility with use of R-32
Construction: Architectural Coatings	Painting included for the parking area
Operations: Architectural Coatings	No reapplication
Construction: Paving	Included non asphalt foundations for buildings

BESS EFFICIENCY

Year	LADWP Intensity Factor	Lost RT Efficiency per Year	Annual Indirect GHG Emissions from RT Efficiency Loss	
	lbs CO_2e/MWh	MWh	tons	metric tons
2025	499	16,425	4098.04	3717.68
2026	474.05	16,425	3893.14	3531.79
2027	449.10	16,425	3688.23	3345.91
2028	424.15	16,425	3483.33	3160.03
2029	399.20	16,425	3278.43	2974.14
2030	374.25	16,425	3073.53	2788.26
2031	349.30	16,425	2868.63	2602.37
2032	324.35	16,425	2663.72	2416.49
2033	299.40	16,425	2458.82	2230.61
2034	274.45	16,425	2253.92	2044.72
2035	249.50	16,425	2049.02	1858.84
2036	224.55	16,425	1844.12	1672.95
2037	199.60	16,425	1639.22	1487.07
2038	174.65	16,425	1434.31	1301.19
2039	149.70	16,425	1229.41	1115.30
2040	124.75	16,425	1024.51	929.42
2041	99.80	16,425	819.61	743.54
2042	74.85	16,425	614.71	557.65
2043	49.90	16,425	409.80	371.77
2044	24.95	16,425	204.90	185.88
2045	**0.00**	**16,425**	**0.00**	**0.00**
2050	0.00	16,425	0	0
2055	0.00	16,425	0	0
		Total:	**43,029.39**	**39,035.61**

APPENDIX B

Baseline Environmental Consulting Air Quality Technical Report Memorandum

BASELINE ENVIRONMENTAL CONSULTING

MEMORANDUM

Date: October 24, 2024 **Job No.:**24208-00

To: Kara Laurenson-Wright, SWCA Environmental Consultants

From: Yilin Tian, Baseline Environmental Consulting

Subject: Air Quality Technical Report, Soda Mountain Solar Project, San Bernardino County, California

Baseline Environmental Consulting (Baseline) has prepared this technical study to evaluate potential air quality impacts associated with implementation of the Soda Mountain Solar Project (project) proposed by Soda Mountain Solar, LLC. The 2,670-acre project site is located in unincorporated San Bernardino County, California, approximately 50 miles northeast of Barstow. SWCA has completed a project-level analysis of potential air quality impacts for CEQA review. To utilize the California Energy Commission's (CEC) Opt-in Certification Program, additional air quality analysis has been prepared in this technical study to support an Application for Certification (AFC) (20 CCR, Div. 2, Ch. 5 App. B), focusing on the CEC requirements in Appendix B of the AFC Program Guidance under sections (g)(8)(H) through (g)(8)(I) and sections (g)(9)(A) through (g)(9)(D).

Meteorological Conditions

In accordance with AFC section (g)(8)(H), AERMOD-ready meteorological data process by the California Air Resources Board (CARB)[1] from the Barstow-Daggett Airport Meteorological Station (KDAG) were selected to represent the meteorological conditions of the project area. The Barstow-Daggett Airport Meteorological Station is representative due to its proximity to the project site, similar complexity of the terrain and surrounding land use, and the time period of available data. The Barstow-Daggett Airport Meteorological Station is the nearest meteorological station located about 38 miles southwest of the project site. The project site is located in a valley dividing the northern and southern portions of the Soda Mountains, and similarly the Barstow-Daggett Airport Meteorological Station is located in a valley with the Calico Mountains to the north and Newberry Mountains to the south. In addition, the surrounding land uses of the Barstow-Daggett Airport Meteorological Station are similar to the project site, which is composed of mostly undeveloped desert. CARB has process five recent years of data from 2015 to 2020 for the Barstow-Daggett Airport Meteorological Station.

[1] California Air Resources Board (CARB), 2024. HARP AERMOD Meteorological Files. Available at: https://ww2.arb.ca.gov/resources/documents/harp-aermod-meteorological-files

Therefore, the Barstow-Daggett Airport Meteorological Station is the most representative station meteorologically for dispersion modeling and health risk assessments at the project site.

The AERMOD-ready meteorological data processed for this station include surface and profile files for the estimation of atmospheric boundary layer parameters used in air dispersion modeling. The surface and profile files were developed based on surface meteorological data, upper air meteorological data, and land use data. The quarterly wind tables, wind roses, ambient temperatures, and relative humidity for year 2020 are summarized in **Attachment A**. The prevailing wind direction is from the west, with the quarterly average wind speed ranging from 9.5 miles per hour to 14.5 miles per hour through the year. The electronic version of the meteorology data is provided in **Attachment B**.

Criteria Air Pollutant Air Quality Impacts

Construction and operation of the project would generate criteria pollutant emissions that could potentially impact regional air quality. The project's construction and operational emissions of criteria air pollutants and precursors were estimated using the most recent version of the California Emissions Estimator Model (CalEEMod version 2022.1), as reported in the Air Quality and Greenhouse Gas Technical Report for the project prepared by SWCA in March 2024 (Air Quality Report).[2]

Project construction is expected to last for approximately 18 months from March 2025 through the end of August 2026. The first full year of project operation is expected in 2027. As stated in the Air Quality Report, the estimated unmitigated construction and operational emissions for all pollutants are below Mojave Desert Air Quality Management District's (MDAQMD) daily and annual significance thresholds; therefore, the project would not violate or contribute substantially to an existing or projected air quality violation. The analysis included in the Air Quality Report satisfies the requirements under AFC sections (g)(8)(I)(i) and (g)(8)(I)(ii).

AFC section (g)(8)(I)(iii) requires a protocol for a cumulative air quality modeling impacts analysis of the project's typical operating mode in combination with other stationary emissions sources within a six-mile radius which have received construction permits but are not yet operational or are in the permitting process. The following two projects are located within the six-miles radius of the project:

- I-15 Mojave Wildlife Crossings Restoration Project
- Brightline West - Las Vegas to Victor Valley

[2] SWCA, 2024. Air Quality and Greenhouse Gas Technical Report for the Soda Mountain Solar Project, San Bernardino County, California. March,

MDAQMD's CEQA and Federal Conformity Guidelines were prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the project site.[3] MDAQMD's air quality thresholds of significance are designed to achieve or maintain attainment designations associated with the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS). Individual projects that do not exceed the MDAQMD's thresholds of significance would not result in a cumulatively considerable contribution to a nonattainment status or the health effects associated with criteria air pollutants. Since the project's construction and operational emissions are below the MDAQMD's applicable thresholds of significance, the project's cumulative contribution of criteria air pollutant emissions would not cause or contribute to a violation of any ambient air quality standard.

AFC section (g)(8)(I)(iv) requires an air dispersion modeling analysis of the impacts associated with the project's initial commissioning phase emissions on state and federal ambient air quality standards for NO_x, SO_2, CO, PM_{10}, and $PM_{2.5}$. Operation of the project will be limited to panel washing and maintenance. Criteria air pollutant emission sources during project operations would include mobile sources, water use, and maintenance. According to the Air Quality Report, the project's daily and annual operational emissions of criteria air pollutants would be substantially less than the construction emissions. Therefore, an air dispersion modeling analysis of the impacts associated with project construction emissions on state and federal ambient air quality standards, instead of the project's initial commissioning phase, was performed to evaluate the worst-case scenario since the project's operational emissions are relatively marginal.

The nearest sensitive receptor that could be exposed to criteria air pollutants generated by the project is located next to the Rasor Road service station, roughly 260 feet southwest of the project boundary. This stand-alone house is used as accommodation for four workers. There are no other sensitive receptors within 1,500 feet of the project site and actual construction occurs more than 3,500 feet from this stand-alone home.

A screening-level modeling analysis of criteria air pollutants generated during project construction was conducted using the U.S. Environmental Protection Agency's AERMOD air dispersion model. For modeling purposes, daily emissions from construction were assumed to occur 10 hours per day between 7 a.m. and 5 p.m., Monday through Friday. The criteria air pollutant emissions from project construction were represented in the AERMOD model as one area sources encompassing the solar array footprint on the project site. It was conservatively assumed that all criteria air pollutant emissions, including on-road and off-road emissions, would occur on site to represent the worst-case scenario. Construction of the project is

[3] Mojave Desert Air Quality Management District (MDAQMD). 2020. California Environmental Quality Act (CEQA) And Federal Conformity Guidelines. Available at: https://www.mdaqmd.ca.gov/home/showpublisheddocument/8510/638126583450270000.

expected to last 18 months. The emission rate for each criteria air pollutant of interest was based on the actual hours of work per day and the highest peak daily emissions during construction (2025 peak daily emissions).

A uniform grid of receptors spaced 500 meters apart was created for ground level receptors at heights of 1.5 meters to develop isopleths (i.e., concentration contours) around the project site that illustrate the general air dispersion pattern from the emissions sources. In addition, a discrete receptor was created for ground level receptors at heights of 1.5 meters to calculate concentrations at the nearest sensitive receptor. The AERMOD model input parameters included 1 year of CARB-processed meteorological data from the Barstow-Daggett Airport Meteorological Station mentioned above. The input parameters and assumptions used for estimating the dispersion of criteria air pollutants are included in **Attachment C**.

As shown in **Table 1**, the estimated concentrations of PM_{10}, $PM_{2.5}$, NO_2, CO, and SO_2, at the nearest sensitive receptor during project construction would be below the CAAQS and NAAQS.

Table 1. Estimated Criteria Air Pollutant Concentrations at the Nearest Receptor

Pollutant	Averaging Time	Unit	Ambient Air Quality Standards[1]		Concentrations at the Nearest Receptor
			CAAQS	NAAQS	Construction
PM_{10}	24-Hour	µg/m³	50	150	0.17
	Annual	µg/m³	20	---	0.007
$PM_{2.5}$	24-Hour	µg/m³	---	35	0.07
	Annual	µg/m³	12	12	0.003
NO_2	1-Hour	ppm	0.18	0.100	0.006
	Annual	ppm	0.030	0.053	<0.001
CO	1-Hour	ppm	20	35	0.015
	8-Hour	ppm	9.0	9	<0.001
SO_2	1-Hour	ppm	0.25	0.075	<0.001
	24-Hour	ppm	0.04	0.14	<0.001
	Annual	ppm	---	0.030	<0.001

Notes: ppm = parts per million; µg/m³ = micrograms per cubic meter; --- = not applicable
[1] Bay Area Air Quality Management District (BAAQMD), 2017b. Air Quality Standards and Attainment Status. Available at: http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status, accessed May 30, 2019. Last updated January 5, 2017.
Source: Attachment C

Health Risk Assessment

Project construction would generate diesel particulate matter (DPM) emissions from the exhaust of off-road diesel construction equipment. section (g)(9)(A), an assessment of the potential risk to human health from the project's hazardous air emissions during construction

was performed using CARB's Hotspots Analysis and Reporting Program (HARP). The potential cancer risks and chronic hazard index (HI) to sensitive receptors exposed to DPM emissions during project construction were evaluated using HARP, which includes cancer potency values and noncancer reference exposure levels approved by the Office of Environmental Health Hazard Assessment (OEHHA).[4] The acute HI for DPM was not calculated because an acute reference exposure level has not been approved by OEHHA.

For this analysis, total PM_{10} emission rates were used as a surrogate for DPM, which is a conservative assumption because more than 90 percent of DPM is less than 1 micron in diameter. The ground level PM_{10} concentrations at the nearest sensitive receptor were estimated using the AERMOD air dispersion model and the same modeling parameters described above, except for the PM_{10} emission rate. For this analysis, the PM_{10} emission rate was based on the actual hours of work and total PM_{10} mass emission averaged over the entire duration of construction.

Potential cancer health risk and chronic HI were evaluated for the maximally exposed individual resident (MEIR) on the ground floor of the nearest residence located about 260 feet southwest of the project boundary. Because this residence is used to accommodate workers, the starting age of exposure was assumed to be 16 years old. Project construction is expected to last for approximately 18 months. It was conservatively assumed that an adult worker would work in the same location during the entire construction duration (rounded up to 2 years). As required by AFC section (g)(9)(B), a listing of the input data and output results, in both electronic and print formats, used to prepare the HARP health risk assessment are provided in **Attachment D**. As required by AFC section (g)(9)(D), the MEIR location is shown in **Figure 1**.

Estimates of the health risks at the MEIR from exposure to DPM during project construction are summarized and compared to the MDAQMD's thresholds of significance in **Table 2**. The estimated excess cancer risk, chronic and acute HI for DPM from construction emissions were below the thresholds of significance. Therefore, construction of the project would not expose existing sensitive receptors to substantial concentrations of hazardous air pollutants from project construction.

Table 2: Health Risks during Project Construction

Emissions Scenario	Receptor	Diesel Particulate Matter		
		Cancer Risk (per million)	Chronic Hazard Index	Acute Hazard Index
Construction	MEIR	0.038	0.001	0

[4] Office of Environmental Health Hazard Assessment (OEHHA), 2015. Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, May.

MDAQMD Thresholds of Significance	10	1.0	1.0
Exceed Threshold?	No	No	No

Notes: $\mu g/m^3$ = micrograms per cubic meter

AFC section (g)(9)(C) requires the identification of available health studies through the local public health department concerning the potentially affected population within a six-mile radius of the proposed power plant site related to respiratory illnesses, cancers or related diseases. The San Bernardino County Public Health Department is the local public health department. Based on a review of the Department's available data and report,[5] no health studies concerning the potentially affected population within a six-mile radius of the proposed power plant site related to respiratory illnesses, cancers or related diseases have been identified.

As part of the National Air Toxics Assessment, local DPM concentrations, cancer risk, and non-cancer respiratory risk associated with cumulative exposure to air toxics were obtained via the Environmental Protection Agency's (EPA) Analytical Tools Interface for Landscape Assessments (ATtILA) Interactive Map.[6] The DPM concentrations in the project vicinity are less than 0.251 $\mu g/m^3$. The cancer risk due to cumulative air toxics is less than 28.5 in a million and the non-cancer respiratory risk (HI) is less than 0.362. In addition, the California Emission Inventory Development and Reporting System (CEIDARS),[7]- a database management system developed by California Air Resources Board to track statewide criteria pollutant and air toxic emissions, identified one stationary source, California State University Desert Studies Center (Facility ID: 3238), within the six-mile radius of the proposed power plant. However, the associated health risks were not reported in CEIDARS.

[5] San Bernardino County Public Health, Data and Report. Available at: https://dph.sbcounty.gov/data/
[6] EPA Analytical Tools Interface for Landscape Assessments (ATtILA) Interactive Map, 2024. Available at: https://enviroatlas.epa.gov/enviroatlas/interactivemap/
[7] California Air Resources Board (CARB), 2024. California Emission Inventory Development and Reporting System. Accessed via: https://ww2.arb.ca.gov/applications/facility-search-engine

FIGURE

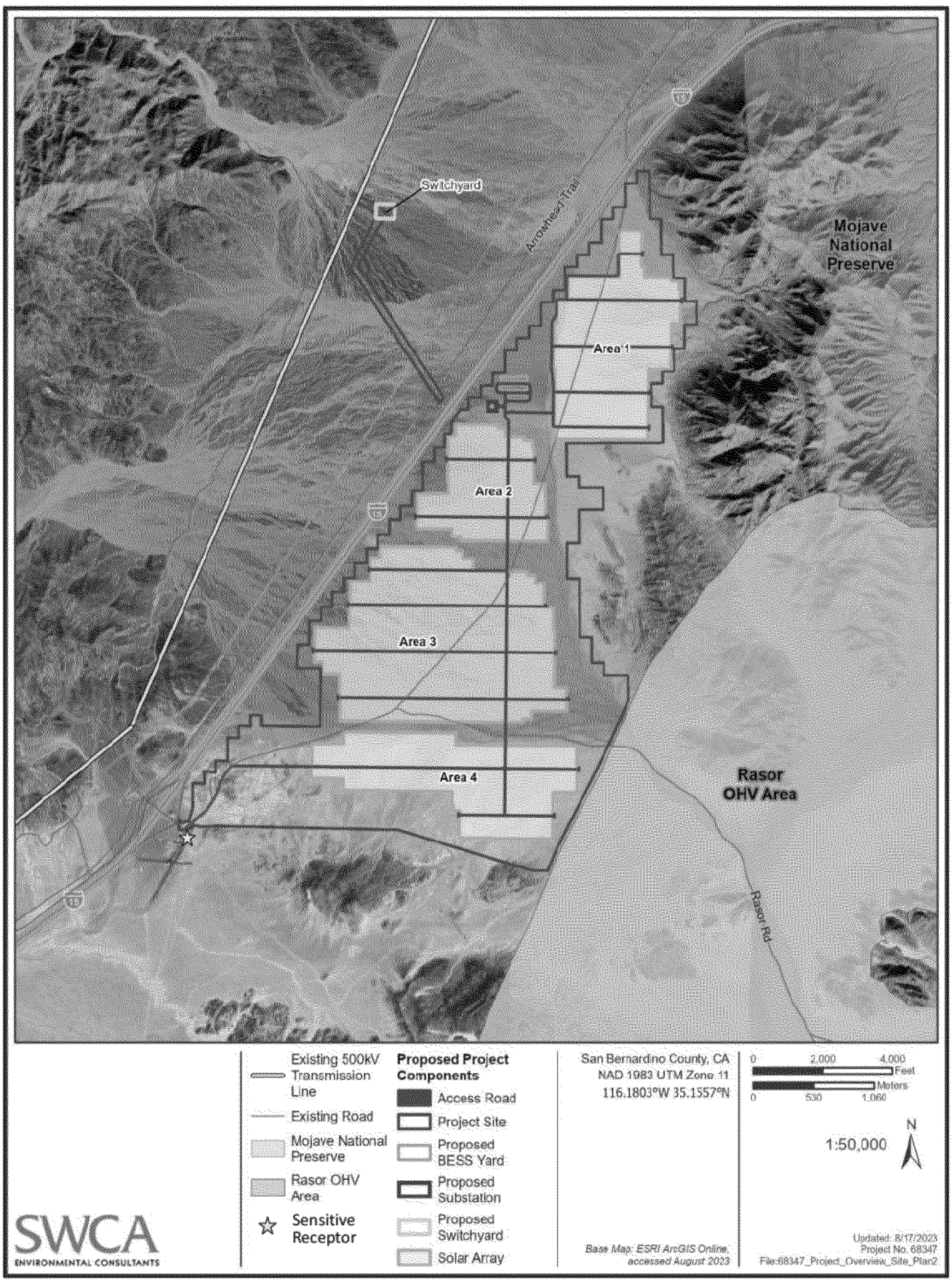


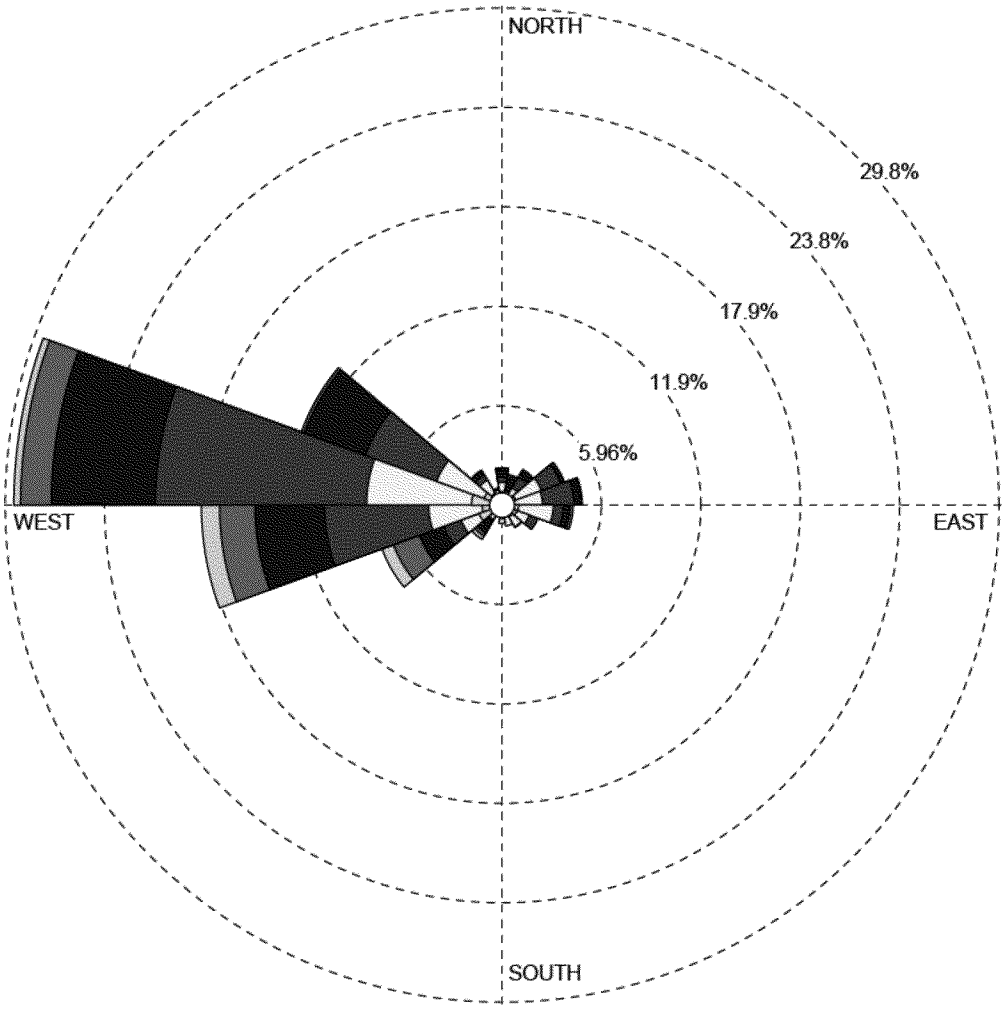
Figure 1. Sensitive Receptor Location

ATTACHMENT A
SUMMARY OF METEOROLOGICAL CONDITIONS

WIND ROSE PLOT: Soda Mountain Solar Project

Station #23161 - DAGGETT/FAA AIRPORT, CA

DISPLAY:
Wind Speed
Direction (blowing from)



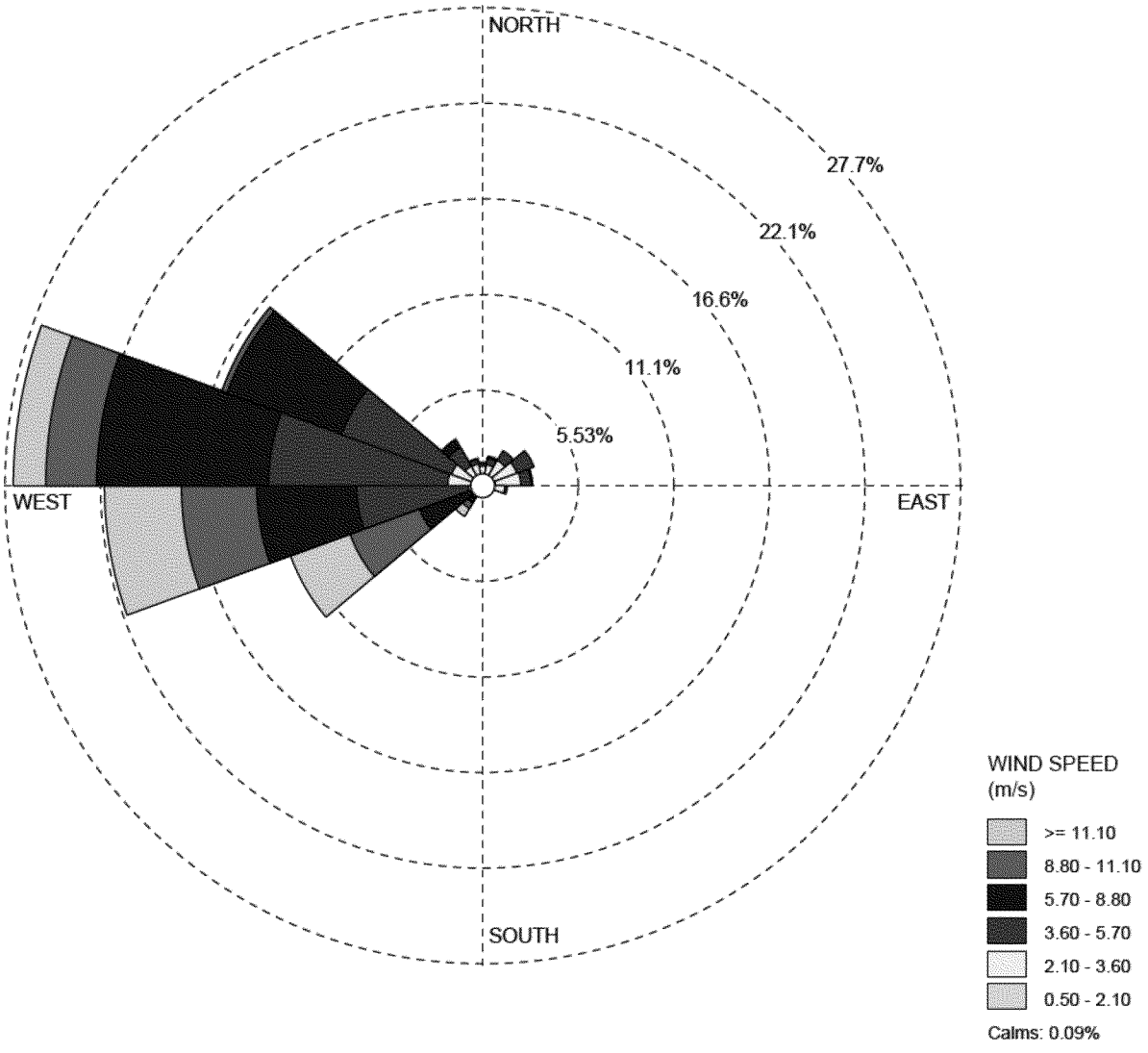
COMMENTS:	DATA PERIOD:	COMPANY NAME:	
2020 First Quarter	**Start Date: 1/1/2020 - 00:00** **End Date: 3/31/2020 - 23:59**		
		MODELER:	
	CALM WINDS: **0.09%**	TOTAL COUNT: **4368 hrs.**	
	AVG. WIND SPEED: **4.72 m/s**	DATE: **6/5/2024**	PROJECT NO.: **24208-00**

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT: Soda Mountain Solar Project

Station #23161 - DAGGETT/FAA AIRPORT, CA

DISPLAY:
Wind Speed
Direction (blowing from)



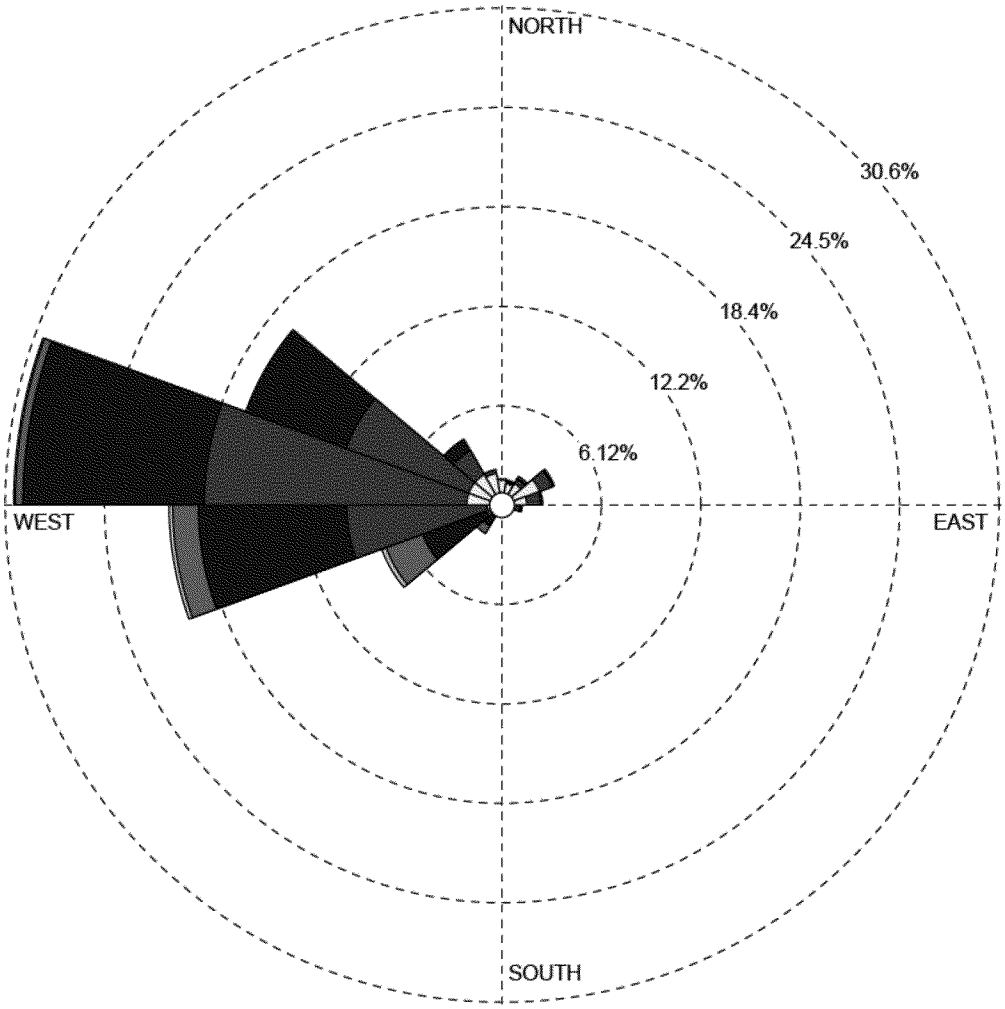
COMMENTS: 2020 Second Quarter	DATA PERIOD: **Start Date: 4/1/2020 - 00:00** **End Date: 6/30/2020 - 23:59**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **0.09%**	TOTAL COUNT: **4290 hrs.**	
	AVG. WIND SPEED: **6.46 m/s**	DATE: **6/5/2024**	PROJECT NO.: **24208-00**

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT: Soda Mountain Solar Project

Station #23161 - DAGGETT/FAA AIRPORT, CA

DISPLAY:
Wind Speed
Direction (blowing from)



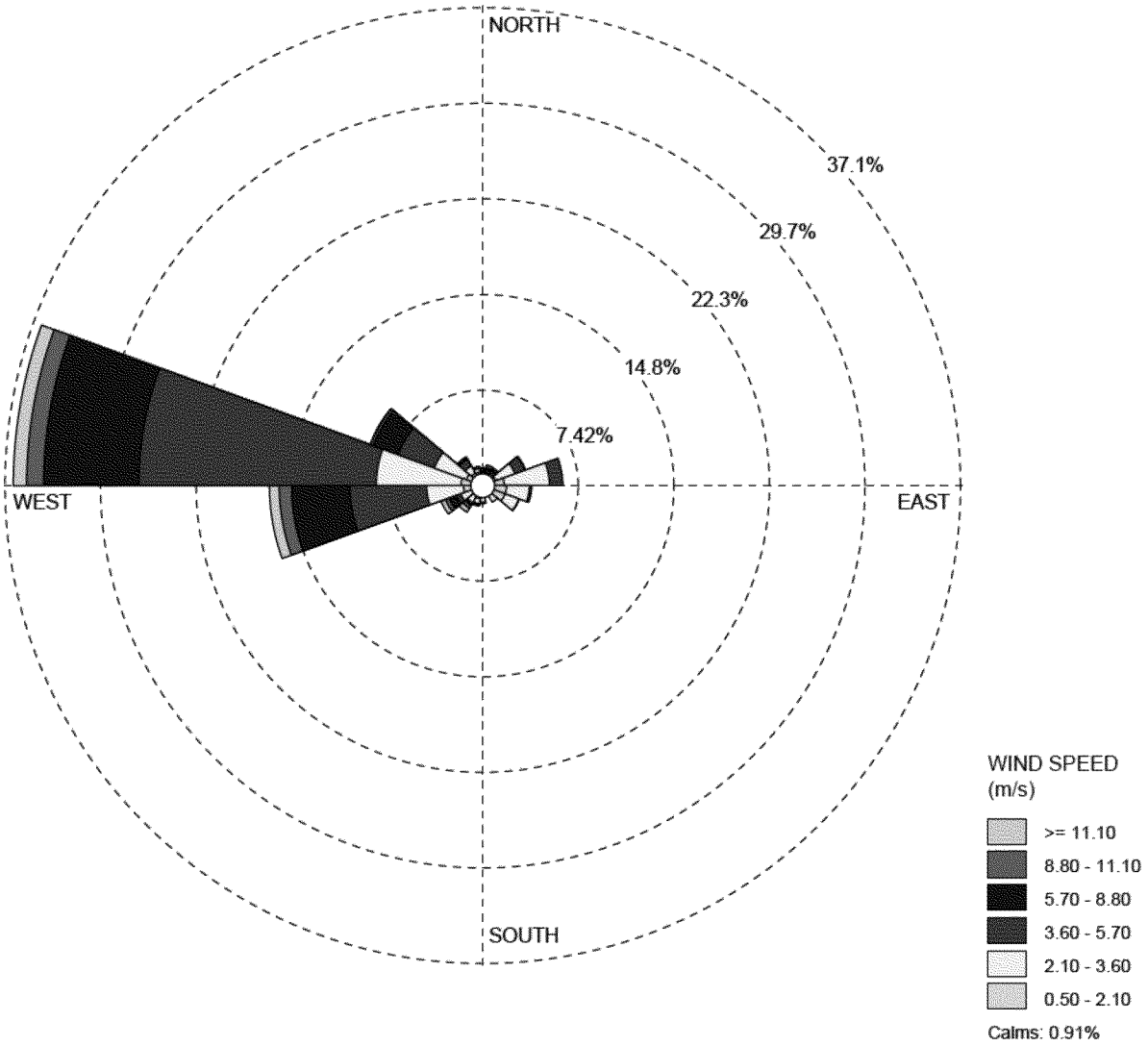
COMMENTS: 2020 Third Quarter	DATA PERIOD: **Start Date: 7/1/2020 - 00:00** **End Date: 9/30/2020 - 23:59**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **0.46%**	TOTAL COUNT: **4284 hrs.**	
	AVG. WIND SPEED: **5.28 m/s**	DATE: **6/5/2024**	PROJECT NO.: **24208-00**

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT: Soda Mountain Solar Project

Station #23161 - DAGGETT/FAA AIRPORT, CA

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS: 2020 Fourth Quarter	DATA PERIOD: **Start Date: 10/1/2020 - 00:00** **End Date: 12/31/2020 - 23:59**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **0.91%**	TOTAL COUNT: **4400 hrs.**	
	AVG. WIND SPEED: **4.27 m/s**	DATE: **6/5/2024**	PROJECT NO.: **24208-00**

WRPLOT View - Lakes Environmental Software

2020 First Quarter - Wind Speeds (m/s)

Directions / Wind Classes (m/s)	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
350 - 10	36	24	14	20	4	0	98
10 - 30	14	14	12	32	6	4	82
30 - 50	30	22	34	22	0	0	108
50 - 70	38	72	54	10	0	0	174
70 - 90	32	74	82	20	2	0	210
90 - 110	44	90	26	18	8	0	186
110 - 130	42	34	24	0	0	0	100
130 - 150	36	30	2	0	0	0	68
150 - 170	32	24	0	0	0	0	56
170 - 190	36	12	0	0	0	0	48
190 - 210	16	6	0	0	2	0	24
210 - 230	24	20	4	36	10	10	104
230 - 250	64	50	48	68	72	32	334
250 - 270	52	140	272	182	92	48	786
270 - 290	80	274	552	272	80	18	1276
290 - 310	50	132	198	170	8	0	558
310 - 330	36	40	16	14	0	0	106
330 - 350	24	16	4	0	2	0	46
Sub-Total	686	1074	1342	864	286	112	4364
Calms							4
Missing/Incomplete							0
Total							4368

2020 Second Quarter - Wind Speeds (m/s)

Directions / Wind Classes (m/s)	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
350 - 10	10	15	4	1	0	0	30
10 - 30	7	20	8	1	2	0	38
30 - 50	2	35	14	0	0	0	51
50 - 70	3	43	23	0	0	0	69
70 - 90	16	32	13	2	0	0	63
90 - 110	7	21	3	0	0	0	31
110 - 130	2	8	1	2	0	0	13
130 - 150	5	2	0	2	0	0	9
150 - 170	3	1	1	0	0	0	5
170 - 190	1	3	0	0	0	0	4
190 - 210	3	1	1	0	0	0	5
210 - 230	6	6	6	7	8	12	45
230 - 250	1	2	13	69	93	80	258
250 - 270	3	15	141	126	95	97	477
270 - 290	4	40	226	217	64	41	592
290 - 310	5	37	147	154	7	0	350
310 - 330	7	22	27	12	0	0	68
330 - 350	8	20	6	1	0	0	35
Sub-Total	93	323	634	594	269	230	2143
Calms							2
Missing/Incomplete							39
Total							2184

2020 Third Quarter - Wind Speeds (m/s)

Directions / Wind Classes (m/s)	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
350 - 10	14	56	4	0	0	0	74
10 - 30	12	46	4	0	4	2	68
30 - 50	10	58	14	2	6	0	90
50 - 70	16	90	36	6	0	0	148
70 - 90	6	62	36	6	0	0	110
90 - 110	6	32	10	6	0	0	54
110 - 130	4	6	10	2	0	0	22
130 - 150	8	10	8	2	0	0	28
150 - 170	6	4	2	6	0	0	18
170 - 190	4	0	2	4	0	0	10
190 - 210	8	6	4	0	0	2	20
210 - 230	16	2	12	36	24	0	90
230 - 250	8	10	32	190	104	12	356
250 - 270	2	38	380	404	68	10	902
270 - 290	14	84	700	500	20	4	1322
290 - 310	16	78	350	290	0	0	734
310 - 330	16	82	82	36	0	0	216
330 - 350	24	62	12	0	0	0	98
Sub-Total	190	726	1698	1490	226	30	4360
Calms							20
Missing/Incomplete							36
Total							4416

2020 Fourth Quarter - Wind Speeds (m/s)

Directions / Wind Classes (m/s)	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
350 - 10	20	14	14	12	2	0	62
10 - 30	22	10	14	16	10	0	72
30 - 50	24	24	10	12	0	0	70
50 - 70	48	70	36	2	0	0	156
70 - 90	74	154	46	0	0	0	274
90 - 110	82	78	8	0	0	0	168
110 - 130	82	50	2	0	0	0	134
130 - 150	40	26	0	0	0	0	66
150 - 170	22	14	2	0	0	0	38
170 - 190	36	20	6	0	0	0	62
190 - 210	46	18	4	0	2	2	72
210 - 230	42	26	2	8	12	16	106
230 - 250	40	40	16	26	14	16	152
250 - 270	66	126	262	200	42	34	730
270 - 290	74	290	812	326	58	46	1606
290 - 310	60	116	132	90	10	2	410
310 - 330	50	28	26	8	2	0	114
330 - 350	48	12	8	0	0	0	68
Sub-Total	876	1116	1400	700	152	116	4360
Calms							40
Missing/Incomplete							16
Total							4416

Summary Table for Temperature and Relative Humidity

Season	Average Temperature (F)	Average Relative Humidity (%)
2020 - First Quarter	53.7	41
2020 - Second Quarter	89.7	42
2020 - Third Quarter	94.7	23
2020 - Fourth Quarter	58.6	26

ATTACHMENT B
AERMOD-READY METEOROLOGICAL DATA
(ELECTRONIC VERSION PROVIDED SEPARATELY)

ATTACHMENT C
AERMOD INPUT PARAMETERS AND ASSUMPTIONS

Summary of AERMOD Model Parameters, Assumptions, and Results for Emissions from Construction

AERMOD Model Parameters and Assumptions			
Source Type	**Units**	**Value**	**Notes**
Area Source: Construction			
Average Hours/Work Day	hours/day	7.14	10 hours per day, 5 days per week
Release Height	meters	5.0	SMAQMD, 2015
Initial Vertical Dimension	meters	1.4	USEPA, 2022
PM_{10} Emission Rate	gram/second	0.55615	Estimated based on peak daily emissions
$PM_{2.5}$ Emission Rate	gram/second	0.21540	Estimated based on peak daily emissions
NO_2 Emission Rate	gram/second	2.39409	Estimated based on peak daily emissions
CO Emission Rate	gram/second	3.48697	Estimated based on peak daily emissions
SO_2 Emission Rate	gram/second	0.00653	Estimated based on peak daily emissions
DPM Emission Rate	gram/second	0.44071	Estimated based on total PM_{10} mass emissions and 18 months of construction (391 work days)

AERMOD Model Results				
Pollutant	**Unit**	**Averaging Time**	**Concentration**	**Note**
PM_{10} Concentration	$\mu g/m^3$	24-hour	0.17	
	$\mu g/m^3$	Annual	0.007	
$PM_{2.5}$ Concentration	$\mu g/m^3$	24-hour	0.07	
	$\mu g/m^3$	Annual	0.003	
NO_2 Concentration	ppm	1-Hour	0.0062	Conversion factor: 1 $\mu g/m^3$ NO_2 = 0.000532 ppm
	ppm	Annual	0.00002	
CO Concentration	ppm	1-Hour	0.01488	Conversion factor: 1 $\mu g/m^3$ CO = 0.000873 ppm
	ppm	8-Hour	0.00003	
SO_2 Concentration	ppm	1-Hour	1.15E-05	Conversion factor: 1 $\mu g/m^3$ SO_2 = 0.000382 ppm
	ppm	24-Hour	7.64E-07	
	ppm	Annual	3.82E-08	
DPM Concentration	$\mu g/m^3$	Annual	0.0052	

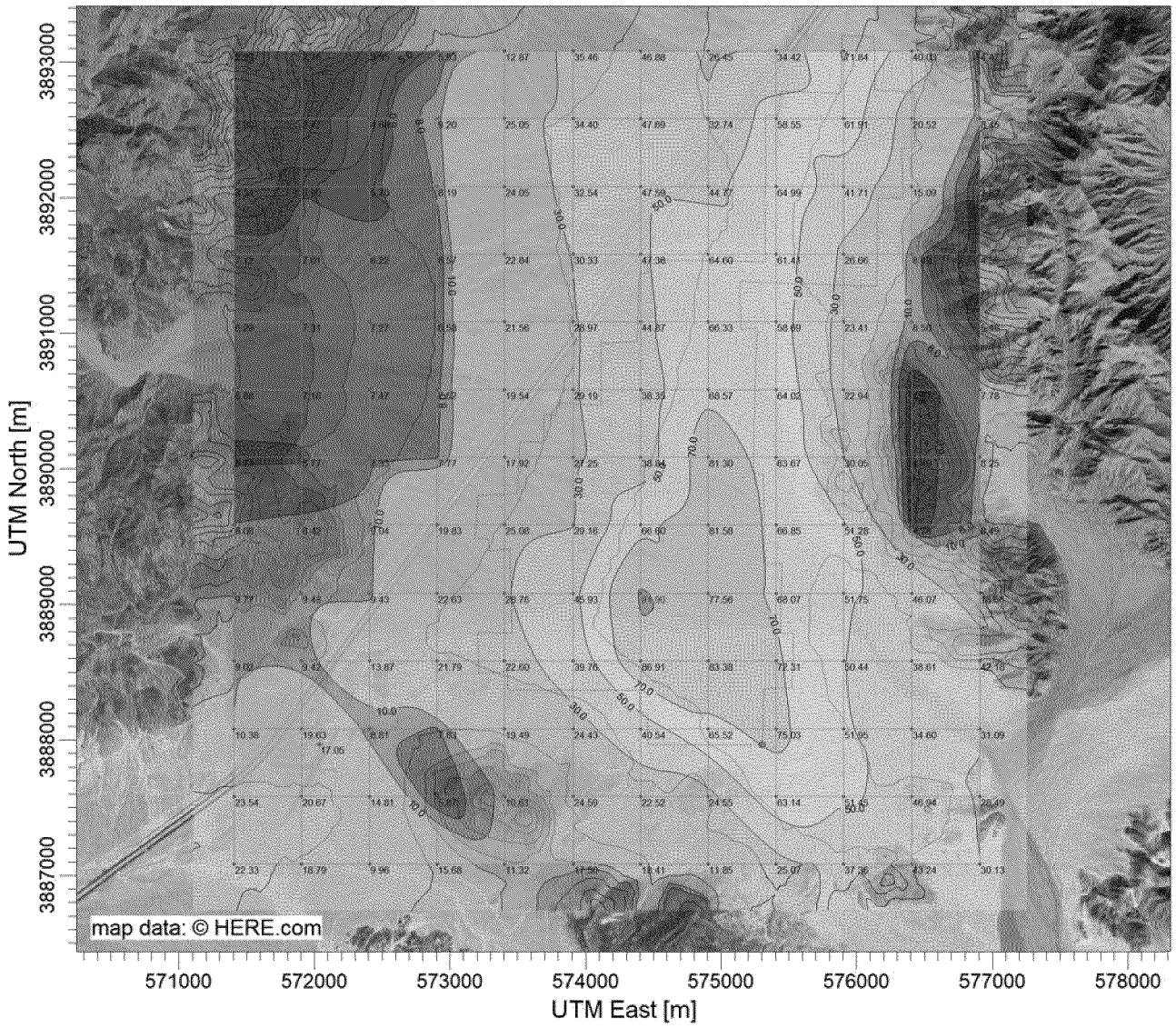
All NOx emissions assumed to be NO_2.

U.S. Environmental Protection Agency (USEPA), 2022. *User's Guide for the AMS/EPA Regulatory Model* (AERMOD).

Sacramento Metropolitan Air Quality Management District (SMAQMD), 2015. *Guide to Air Quality Assessment in Sacramento County* . June.

PROJECT TITLE:

Soda Mountain Solar Project
Construction - CO



PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

Max: 91.9 [ug/m^3] at (574405.52, 3889083.87)

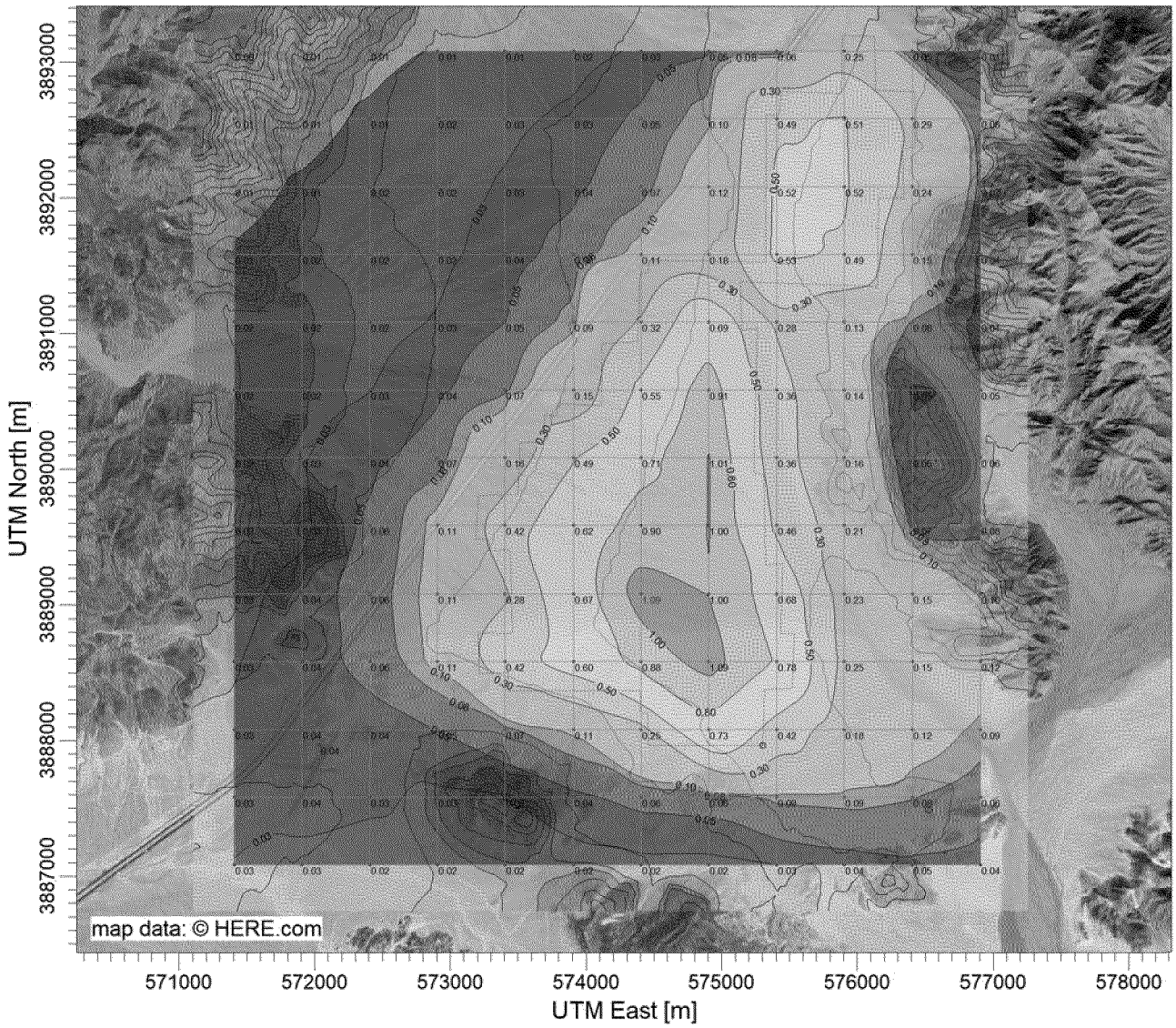
2.2 5.0 6.0 8.0 10.0 30.0 50.0 70.0 90.0 91.9

COMMENTS: 1-hour CO	SOURCES: **1**	COMPANY NAME: **Baseline Environmental Consulting**	
	RECEPTORS: **157**		
	OUTPUT TYPE: **Concentration**	SCALE: 1:50,701 0 2 km	
	MAX: **91.9 ug/m^3**		PROJECT NO.: **24208-00**

AERMOD View - Lakes Environmental Software

PROJECT TITLE:

Soda Mountain Solar Project
Construction - CO



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 1 YEARS FOR SOURCE GROUP: ALL ug/m^3

Max: 1.09 [ug/m^3] at (574405.52, 3889083.87)

0.01 0.03 0.05 0.08 0.10 0.30 0.50 0.80 1.00 1.09

COMMENTS: Annual CO	SOURCES: **1**	COMPANY NAME: **Baseline Environmental Consulting**	
	RECEPTORS: **157**		
	OUTPUT TYPE: **Concentration**	SCALE: 1:50,701 (0 — 2 km)	
	MAX: **1.09 ug/m^3**		PROJECT NO.: **24208-00**

AERMOD View - Lakes Environmental Software