Plan of Development

SODA MOUNTAIN SOLAR PROJECT

BLM Case Number - CACA49584

Proposed Caithness Soda Mountain Solar Facility Near Baker, San Bernardino County, California

March 15, 2011

Prepared for:

United States Department of the Interior
Bureau of Land Management
California Desert District Office
22835 Calle San Juan De Los Lagos
Moreno Valley, CA 92553

Submitted by:

Caithness Soda Mountain, LLC
565 Fifth Avenue, 29th Floor
New York, NY 10017

Prepared by:

RMT, Inc.
4 West Fourth Avenue, Suite 303
San Mateo, CA 94402

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1: Project Description

1.1 Introduction

1.1.1 BACKGROUND

On January 10, 2008, Solenergis, LLC (Solenergis), requested a right-of-way (ROW) grant to construct and operate a 350-megawatt (MW) solar electrical power generating facility (Soda Mountain Project or Project) on federal lands managed by the U.S. Department of the Interior, Bureau of Land Management (BLM), located in San Bernardino County, California. The lead BLM office for this request is the Barstow Field Office, and the BLM case number is CACA49584. Subsequent to that request, Caithness Soda Mountain, LLC (CSM or the Applicant), 565 Fifth Avenue, 29th Floor, New York, New York 10017, became the majority owner of Solenergis and is now responsible for this Project.

This Plan of Development (POD) is organized according to the format set forth by the BLM in its Solar Energy POD Outline, dated July 3, 2008 (BLM 2008). CSM submitted a POD to the BLM Barstow Field Office on September 12, 2008. On December 11, 2008, the BLM Barstow Field Office provided a list of data needed to complete the POD. CSM incorporated the BLM's requests into a revised POD submitted on March 27, 2009. CSM submitted a second revised POD, dated December 1, 2009, based on the BLM's Notice of Deficiency, dated September 30, 2009. BLM provided comments on the December 2009 POD to CSM in February and March 2010. Final comments were provided in November 2010. The comments included requests for additional geologic, hydrologic, and engineering information. CSM commissioned RMT, Inc. (RMT), to conduct additional field work and studies, which are described in Section 1.3.4.

In December 2010, the proposed Project was transferred from the BLM Barstow Field Office to the California Desert District Office renewable energy coordination team.

1.1.2 FACILITY, PLANNED USES, AND GENERATION OUTPUT

Location

The Project site is located approximately 6 miles southwest of Baker, California, along Interstate 15 (I-15). A location map of the site and neighboring terrain is presented in Figure 1.1-1. The existing utilities and major roadways at the site are shown in Figure 1.1-2.

Figure 1.1-1: Project Location

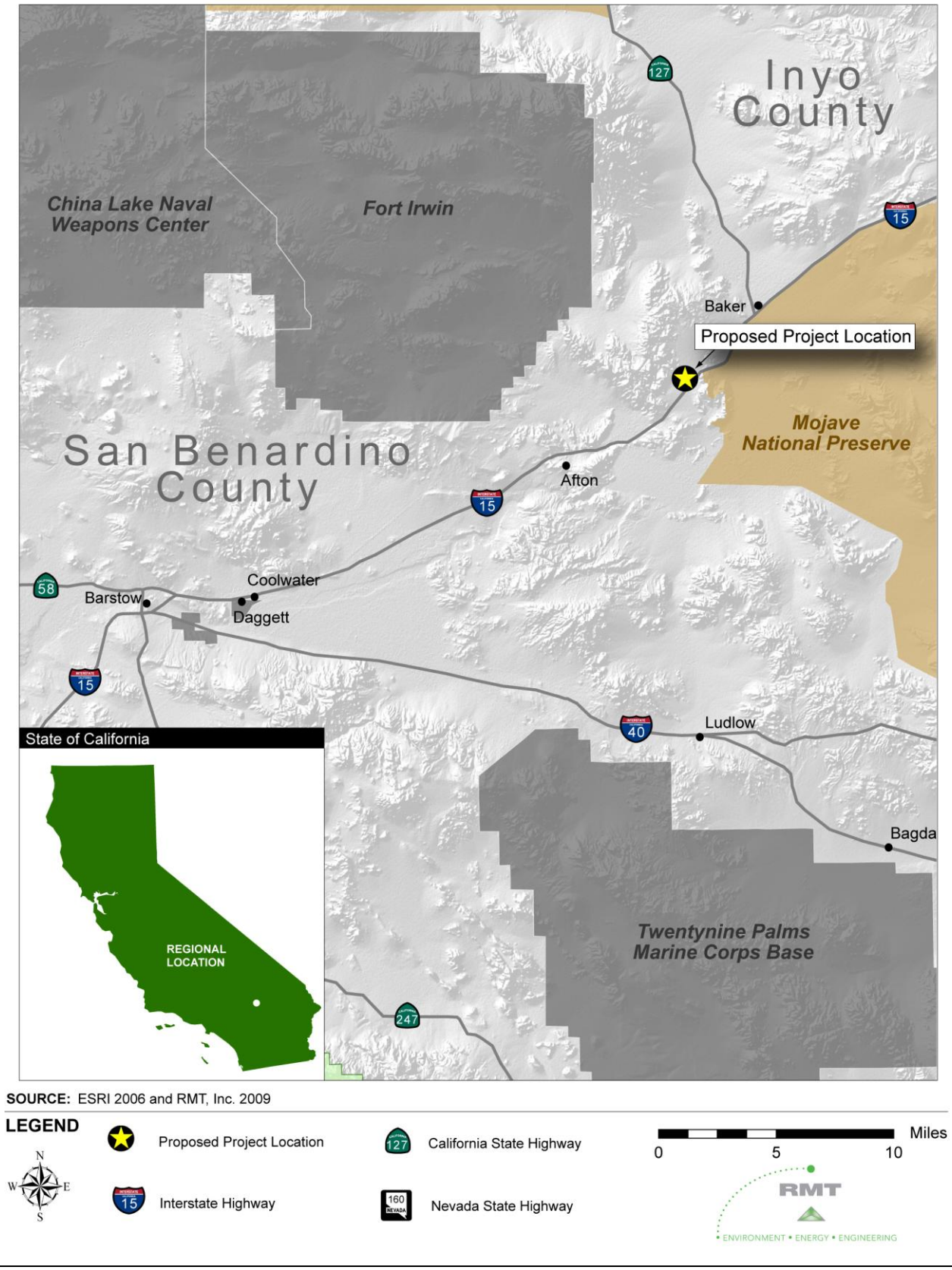
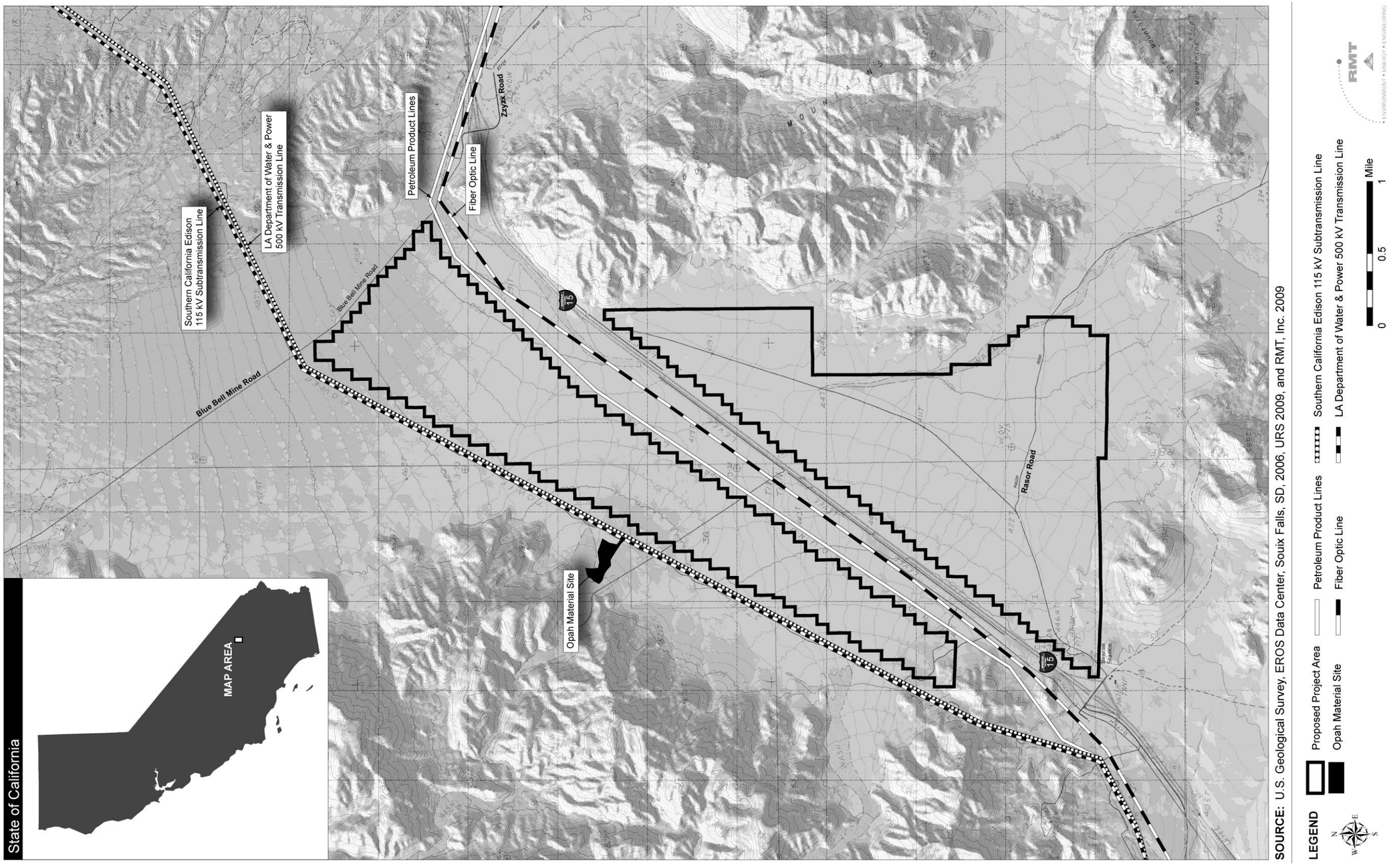


Figure 1.1-2: Existing Utilities and Roadways at the Site



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Project Facilities and Generation

The Project will employ approximately 1.5 million solar panels, grouped into approximately 1,400 tracking arrays, to generate 350 MW[1] of net power that will be delivered to the high-voltage transmission grid. Four tracking arrays, each consisting of 22 trackers, one motor, and 1,050 panels, correspond to a single 1-MW power block. The photovoltaic (PV) panels are made of polycrystalline silicon. Figure 1.1-3 shows the proposed layout of solar arrays at the Project site and Figure 1.1-4 shows the detail of the ancillary buildings.

The ROW area shown in Figure 1.1.3 covers 4,397 acres, of which approximately 2,691 acres (61 percent) would be occupied by the Project's solar array fields. The remaining area (expected to be approximately 1,706 acres) will be used for stormwater control, access roads, ancillary buildings, and reserve land (see Section 1.3.3 for the discussion of surface disturbance).

Within a single 1-MW block, the ratio of the collector surface area to the amount of ground surface occupied by the block will be 33 percent.

Land Use Constraints

The constraints map (Figure 1.1-5) shows local land use constraints that include:

- Mojave National Preserve
- I-15 ROW
- Southern California Edison (SCE) and Los Angeles Department of Water and Power (LADWP) Power Transmission Corridor easements
- Petroleum product easement for two pipelines
- Fiber-optic communications easement
- Telephone easement(s), cellular sites
- BLM-designated routes
- Registered mining claims
- Other notable boundaries

As shown in the project figures and Appendix A, the Project site boundary is composed of Land Parcel Legal Descriptions, modified by adding or subtracting Township quarter/quarter/quarter Sections. The legal description of the ROW is included in Appendix A.

Area of Use

The "area of use" requested in this application includes the areas for all solar panels anticipated to be needed to produce the desired 350-MW output. In addition to the solar array fields, potential uses of the area of use are perimeter access roads, water storage tanks, internal maintenance roads, an equipment yard, operations buildings, transformers and inverters, ROWs for connections to the transmission corridor, corridors for installation and maintenance of the electrical collector system, corridors for connection to the substation, hydraulic structures to control stormwater runoff, and a

[1] MW refers to alternating current (AC) MW, which is an output from the inverters.

modest land reserve in the event it becomes necessary or desirable to reconfigure the array fields within the area of use.

The original ROW area was reduced in 2009 to address cultural resources and biological resources concerns (Figure 1.1-6). The currently proposed ROW area could be reduced to remove land south of the substation on the northwest side of I-15 after final design is complete.

Site Drainage Overview

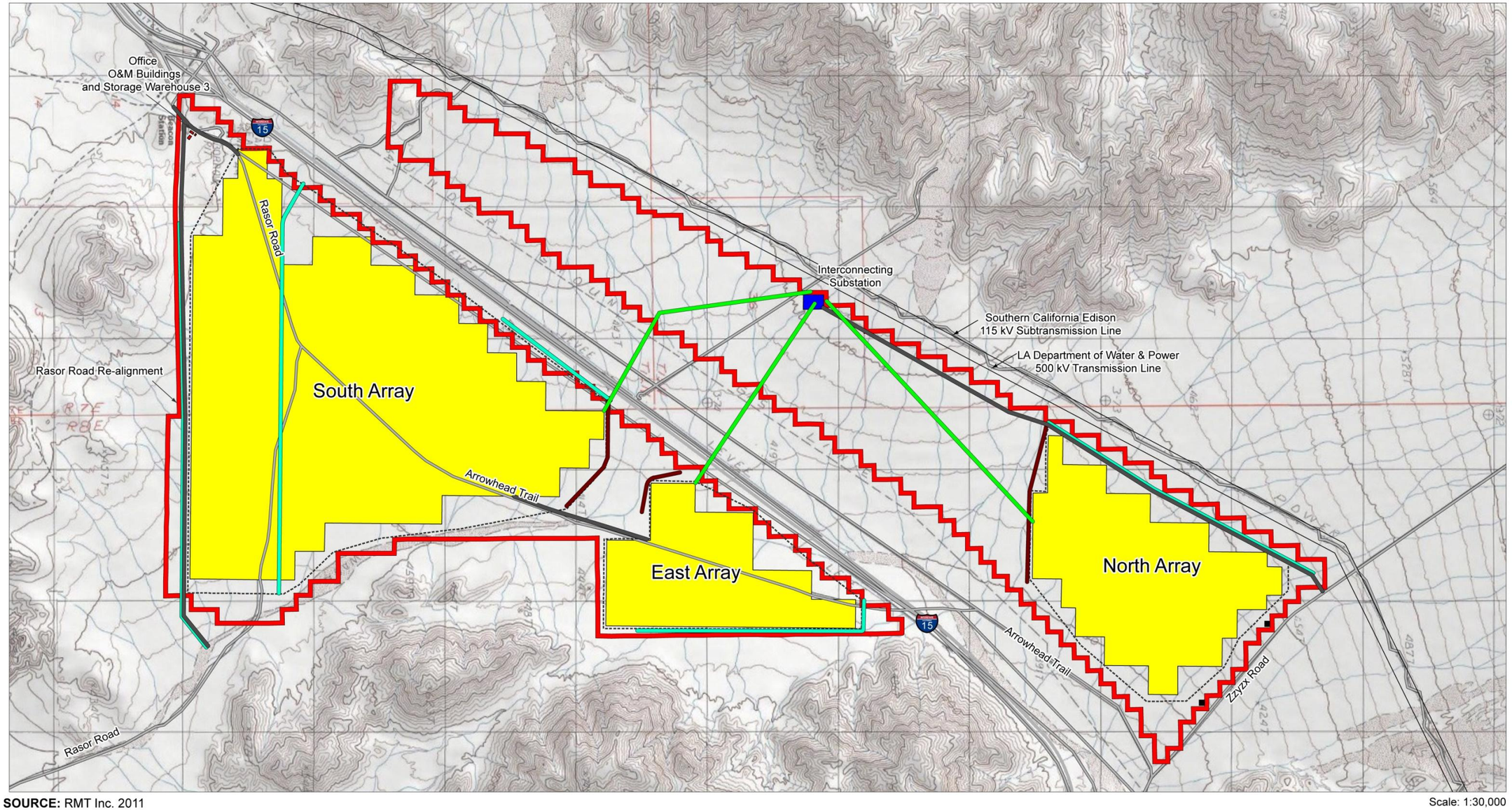
To protect site infrastructure, upgradient stormwater runoff will be routed around Project infrastructure using earthen channels. Solar arrays will not be placed in major washes located within the Project boundaries. Furthermore, to preserve existing sediment transport through the Project site, the development will not detain runoff or interfere with drainage in the washes. Existing on-site stormwater flow patterns, consisting of sheet flow and shallow flow, will be maintained to the greatest extent practicable. By maintaining the existing grades and not significantly increasing the impervious surfaces at the site, the development is not anticipated to significantly increase stormwater runoff. On-site stormwater routing and detention would only be provided if determined to be necessary during detailed design.

1.1.3 SCHEDULE

The environmental review and permitting process for the Project is expected to be completed by the fourth quarter of 2012. Construction is expected to begin in 2013 and to be completed in 2016. Early construction activities will include site preparation, fencing construction, and support facility construction. Array installation is planned to be conducted on a continuous basis such that components arrive at the site in a nearly "just-in-time" fashion over the construction period until the Project is completed.

The Project will initiate operations as soon as interconnections to the existing power lines are made and operational testing is completed. The Project is planned to be operated over the full 30-year term of the ROW agreement and beyond, pending renewal. Renewal discussions are expected to occur near the end of the agreement term. Figure 1.1-7 presents the expected permitting schedule, and Figure 1.1-8 presents the expected construction schedule. Implementation of the Project will require permits and approvals from a variety of agencies, as further discussed in Section 1.4.

Figure 1.1-3: Potential Layout of Solar Arrays



SOURCE: RMT Inc. 2011

Scale: 1:30,000

LEGEND

- Proposed Project Area Boundary
- PV Panel Array
- Preliminary Channel
- Preliminary Diversion Structure
- Representative Collector Route
- Interconnecting Substation
- Building
- Roadway, Trail, or Highway
- Preliminary Access Road
- Potential Well
- Existing Transmission Infrastructure
- Representative Fence

0 0.5 1 Mile

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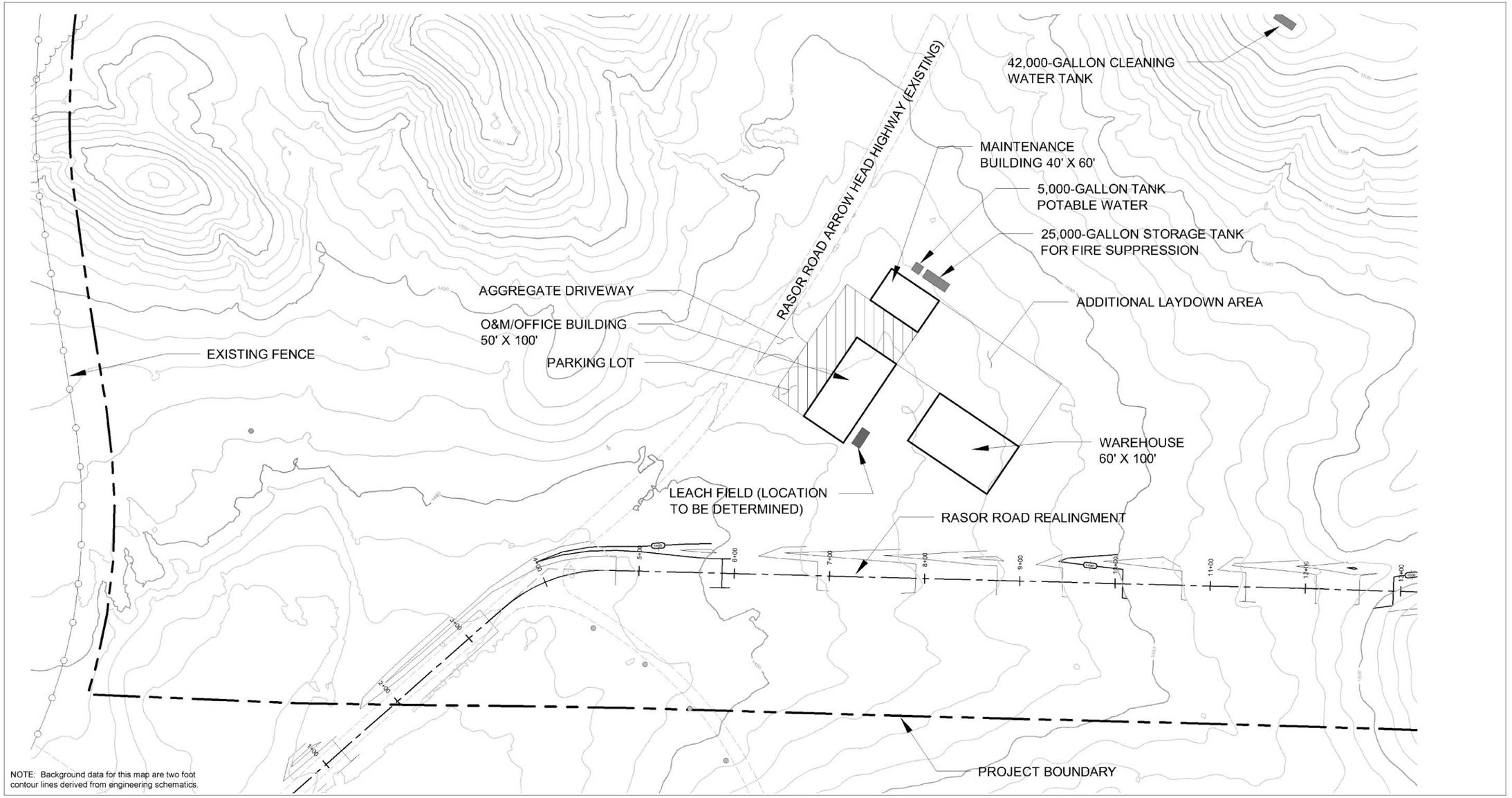
Figure 1.1-4: Building Layout



SOURCE: RMT Inc. 2009

LEGEND

Proposed Project Area Boundary | PV Panel Array | 2 Foot Contour Line | Existing Fence

0 100 200 Feet

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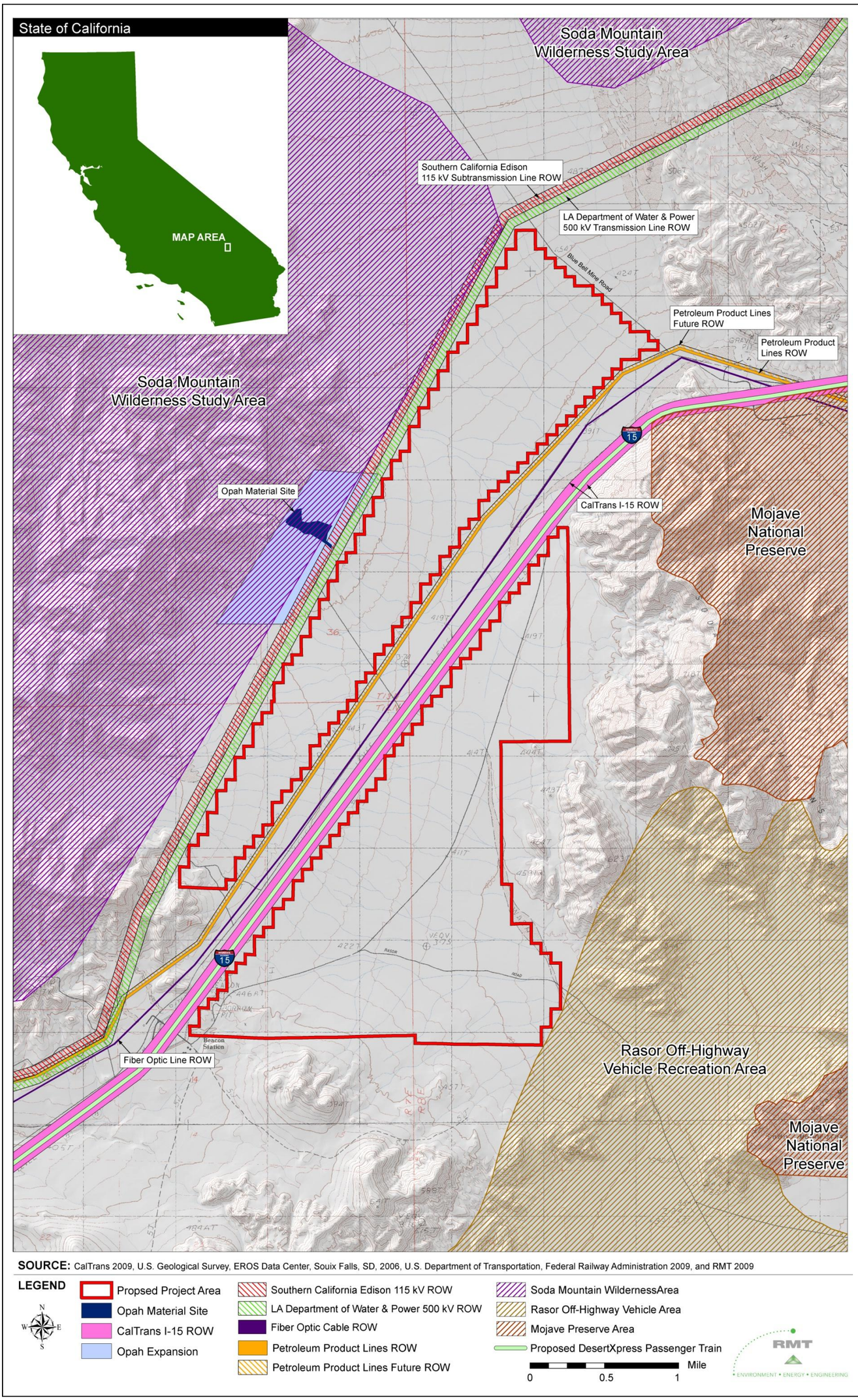


Figure 1.1-5: Land Use Constraints

Figure 1.1-6: Caithness Soda Mountain Right-of-Way-Revisions

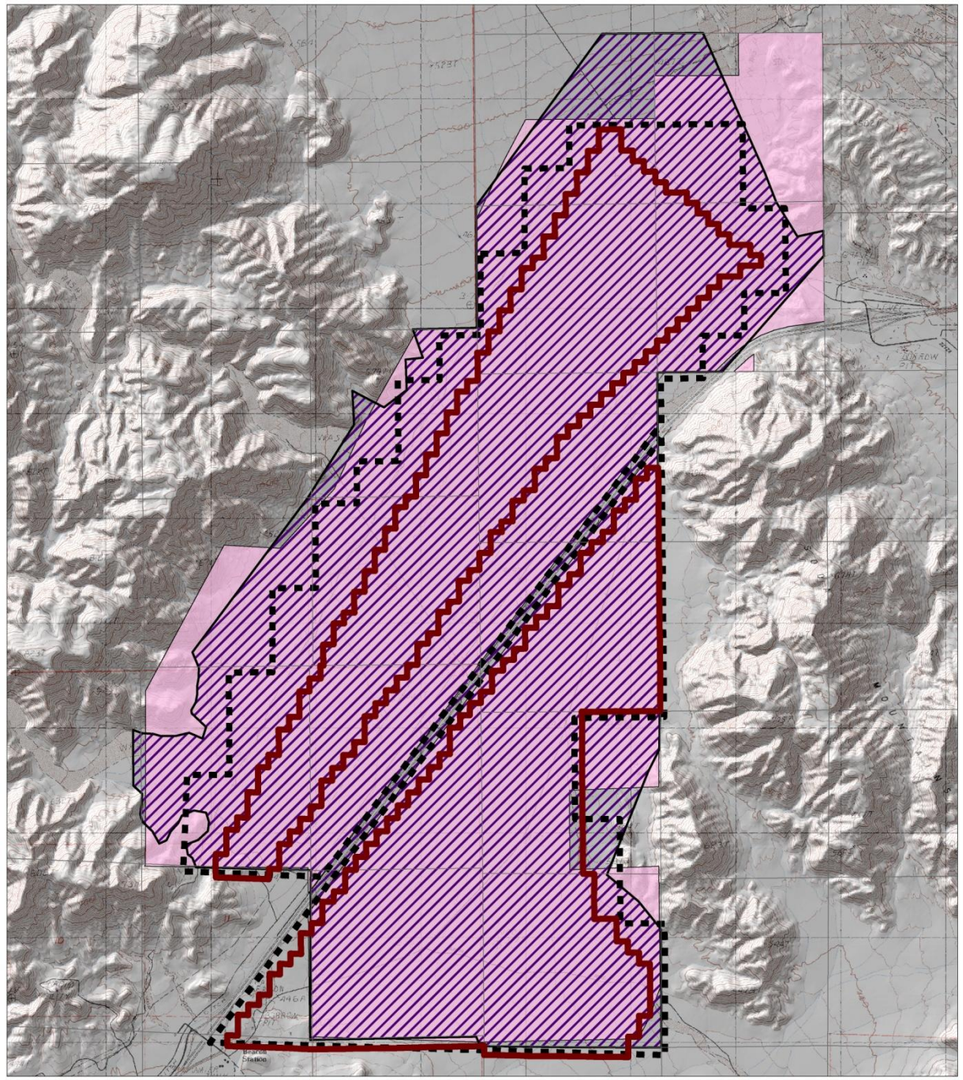
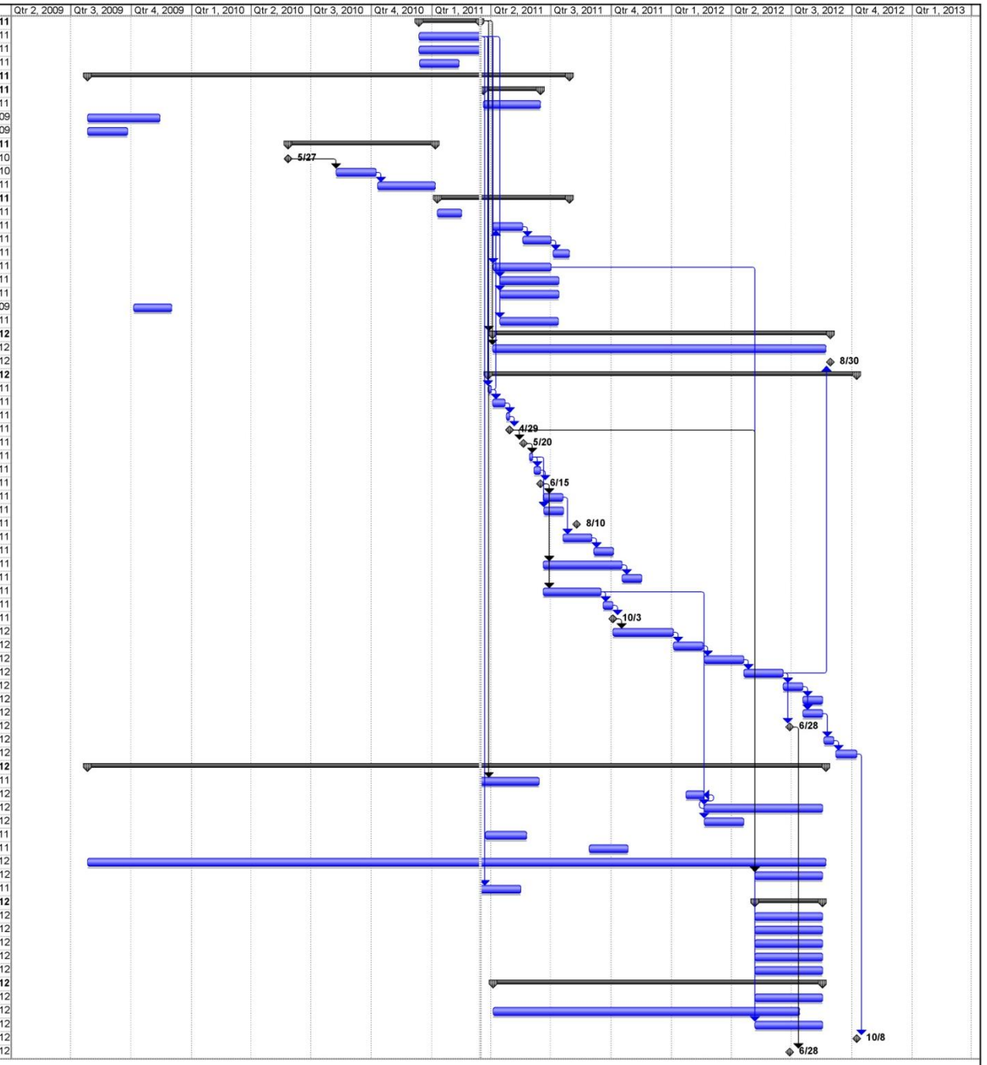


Figure 1.1-7: Permitting Schedule

ID	Task Name	Duration	Start	Predecessors	Finish
1	**Respond to Comments on the Plan of Development**	**93 days**	**Mon 12/13/10**		**Tue 3/15/11**
2	Revise POD	93 days	Mon 12/13/10		Tue 3/15/11
3	Civil Layout/30% Engineering	93 days	Mon 12/13/10		Tue 3/15/11
4	Hydrology and Drainage	60 days	Tue 12/14/10		Fri 2/11/11
5	**Coordinate Baseline Studies**	**733 days**	**Mon 7/27/09**		**Fri 7/29/11**
6	**Biology**	**87 days**	**Mon 3/21/11**		**Wed 6/15/11**
7	Golden Eagle/Bighorn Sheep Survey	87 days	Mon 3/21/11		Wed 6/15/11
8	Cultural Resources	110 days	Mon 7/27/09		Fri 11/13/09
9	Paleontological Resouces	61 days	Mon 7/27/09		Fri 9/25/09
10	**Geotechnical Study**	**224 days**	**Thu 5/27/10**		**Thu 1/6/11**
11	Permit for Geotechnical Study	0 days	Thu 5/27/10		Thu 5/27/10
12	Boring and Other Data Collection	61 days	Mon 8/9/10	11	Fri 10/8/10
13	Geotechnical Report	88 days	Mon 10/11/10	12	Thu 1/6/11
14	**Water Resources**	**201 days**	**Mon 1/10/11**		**Fri 7/29/11**
15	Groundwater Modeling	37 days	Mon 1/10/11		Tue 2/15/11
16	Drilling Permit	46 days	Mon 4/4/11	28	Thu 5/19/11
17	Drill Wells	43 days	Fri 5/20/11	16	Fri 7/1/11
18	Prepare Report	25 days	Tue 7/5/11	17	Fri 7/29/11
19	Air Quality Federal Conformity Analysis	88 days	Tue 4/5/11	2	Fri 7/1/11
20	VRM Class Determination	90 days	Fri 4/15/11	2	Wed 7/13/11
21	Traffic	90 days	Fri 4/15/11	2	Wed 7/13/11
22	Socioeconomics (Completed)	58 days	Mon 10/5/09		Tue 12/1/09
23	Radar/Microwave Study	89 days	Fri 4/15/11	2	Tue 7/12/11
24	**San Bernardino County**	**514 days**	**Mon 4/4/11**	**1**	**Thu 8/30/12**
25	Planning, Public Works, Transportation Ops. Division Coordination	507 days	Mon 4/4/11	1	Wed 8/22/12
26	Receive Permit	0 days	Thu 8/30/12	49	Thu 8/30/12
27	**EIS/EIR Process**	**561 days**	**Mon 3/28/11**		**Mon 10/8/12**
28	Prepare RFP for NEPA/CEQA Contractor	5 days	Mon 3/28/11	2	Fri 4/1/11
29	BLM Review of RFP	19 days	Mon 4/4/11	28	Fri 4/22/11
30	Revise RFP	5 days	Mon 4/25/11	29	Fri 4/29/11
31	Send out RFP	0 days	Fri 4/29/11	30	Fri 4/29/11
32	Receive RFP Responses	0 days	Fri 5/20/11	1FS+21 days	Fri 5/20/11
33	Contractor Selection	5 days	Mon 5/30/11	32	Fri 6/3/11
34	Caithness/Third Party Contracting	10 days	Mon 6/6/11	33	Wed 6/15/11
35	Contract Completed	0 days	Wed 6/15/11	34	Wed 6/15/11
36	Scoping	30 days	Mon 6/20/11	35	Tue 7/19/11
37	Notice of Intent Published in Federal Register	30 days	Tue 6/21/11	33	Wed 7/20/11
38	Scoping Meeting	0 days	Wed 8/10/11		Wed 8/10/11
39	Scoping Meeting Report	44 days	Wed 7/20/11	36	Thu 9/1/11
40	BLM Review of Scoping Meeting Report	30 days	Mon 9/5/11	39	Tue 10/4/11
41	Prepare Admin Draft EIS/EIR for Internal Review	120 days	Mon 6/20/11	35	Mon 10/17/11
42	BLM Review	30 days	Tue 10/18/11	41	Wed 11/16/11
43	Revise and Prepare DEIS/EIR	88 days	Mon 6/20/11	35	Thu 9/15/11
44	Draft EIS/EIR to EPA for Publishing in Federal Register	15 days	Mon 9/19/11	43	Mon 10/3/11
45	Publish NOA of DEIS	0 days	Mon 10/3/11	44	Mon 10/3/11
46	Public Comment Period	92 days	Tue 10/4/11	45	Tue 1/3/12
47	Prepare Admin FEIS/EIR	45 days	Wed 1/4/12	46	Fri 2/17/12
48	BLM Review Admin FEIS/EIR	60 days	Mon 2/20/12	47	Thu 4/19/12
49	Prepare and Publish FEIS/EIR	60 days	Fri 4/20/12	48	Mon 6/18/12
50	Notice of Availability Published in Federal Register	30 days	Tue 6/19/12	49	Wed 7/18/12
51	30 Day Protest Period	30 days	Thu 7/19/12	50	Fri 8/17/12
52	Expedited Governor's Review	30 days	Thu 7/19/12	50	Fri 8/17/12
53	CEQA Notice of Determination Published	0 days	Thu 6/28/12	9FS+10 days	Thu 6/28/12
54	Record of Decision Preparation and NOA	15 days	Mon 8/20/12	52	Mon 9/3/12
55	30 Day Appeal Period	32 days	Fri 9/7/12	54	Mon 10/8/12
56	**Prepare Permit Applications and Coordinate with Agencies**	**1123 days**	**Mon 7/27/09**		**Wed 8/22/12**
57	BLM ROW Grant Application Coordination (if necessary)	90 days	Wed 3/16/11	1	Mon 6/13/11
58	Draft BA Submittal	28 days	Mon 1/23/12	59SF	Mon 2/20/12
59	USFWS Formal Section 7 Consultation	180 days	Mon 2/20/12	43	Fri 8/17/12
60	CDFG Biological Opinion & SAA	60 days	Mon 2/20/12	43	Thu 4/19/12
61	CalTrans Encroachment Permit	63 days	Thu 3/24/11		Wed 5/25/11
62	SHPO: Section 106 Consultation	59 days	Mon 8/29/11		Wed 10/26/11
63	Tribal Consultation	1123 days	Mon 7/27/09		Wed 8/22/12
64	State Water Resources Control Board: Notice of Groundwater Extraction	103 days	Mon 5/7/12	31	Fri 8/17/12
65	State Engineer Review: 30% Design, Hydrology, and Geotech Reports	62 days	Wed 3/16/11	2	Mon 5/16/11
66	**LRWQCB**	**103 days**	**Mon 5/7/12**		**Fri 8/17/12**
67	Construction Stormwater General Permit	103 days	Mon 5/7/12		Fri 8/17/12
68	Approval of Construction SWPPP and SPCCP	103 days	Mon 5/7/12		Fri 8/17/12
69	Industrial Stormwater General Permit	103 days	Mon 5/7/12		Fri 8/17/12
70	CWA Section 401	103 days	Mon 5/7/12		Fri 8/17/12
71	NPDES Permit	103 days	Mon 5/7/12		Fri 8/17/12
72	**San Bernardino County**	**501 days**	**Tue 4/5/11**		**Fri 8/17/12**
73	SWPPP, SPCCP, and NPDES (as necessary)	103 days	Mon 5/7/12		Fri 8/17/12
74	Groundwater Extraction Coordination	466 days	Tue 4/5/11		Fri 7/13/12
75	MDAQMD	103 days	Mon 5/7/12	19	Fri 8/17/12
76	Permit Approvals from Federal Agencies can be Issued After:	0 days	Mon 10/8/12	55	Mon 10/8/12
77	Permit Approvals from State Agencies can be Issued After:	0 days	Thu 6/28/12	53	Thu 6/28/12



Project: Figure 1.1-5 Schedule of Activ
Date: Tue 3/15/11

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

Figure 1.1-8: Construction Schedule

1.2 Purpose and Need for the Project

1.2.1 PURPOSE

CSM proposes to construct a 350-MW solar generation facility in San Bernardino County, California. The primary purpose of the Project is to construct a solar electrical power generation facility on the identified site, and to generate an economically viable source of clean, renewable electricity that meets California's growing demand for power while fulfilling many federal and state renewable energy goals.

1.2.2 NEED

There is a need for additional electrical power in California, especially from renewable generation sources. Electrical energy demand throughout California continues to increase. Peak demand for electricity in southern California grew by 10 percent from 2004 to 2006. The Project will help to satisfy a growing need for electrical power in this region. According to U.S. Census Bureau data, population growth in San Bernardino County was among the ten fastest growing in the United States from 2000 to 2005.

In addition to past population growth, per capita electrical usage continues to increase. Even during the current housing market downturn, California's utilities foresee increasing electrical demand. Based on these growth projections, the utilities are initiating various transmission and generation projects.

1.2.3 FEDERAL ENERGY POLICIES

Federal policies promote the development of renewable energy resources, including solar energy resources, to improve environmental quality, reduce greenhouse gas (GHG) emissions, and reduce consumption of fossil fuels. Federal energy policy promotes the development of solar energy resources on federal lands. As stated in BLM Instruction Memorandum No. 2007-097:

> *As part of an overall strategy to develop a diverse portfolio of domestic energy supplies for our future, the National Energy Policy of 2001 and the Energy Policy Act of 2005 (Public Law 109-58, August 8, 2005) encourage the development of renewable energy resources, which includes solar energy. Section 211 of the Energy Policy Act of 2005 encourages the approval of at least 10,000 MW of non-hydropower renewable energy projects on the public lands within the next 10 years.*

The proposed Project will contribute to achieving this goal.

1.2.4 CALIFORNIA ENERGY POLICIES

This renewable energy Project will also play an important role in achieving the goals of California's renewable energy policies, which encourage developing energy from nonpolluting, renewable sources. Starting in 2002, California established aggressive goals for renewable energy through the Renewable Portfolio Standard (RPS) program. This program establishes minimum renewable energy purchase requirements for California's investor-owned utilities (IOUs). Municipal electrical utilities committed themselves to achieving the same goals. The RPS program required that electric corporations increase procurement from eligible renewable energy resources by at least 1 percent of their retail sales annually, until they reach 20 percent by 2010.

In 2008, the three IOUs (SCE, Pacific Gas and Electric Company [PG&E], and San Diego Gas and Electric Company [SDG&E]) collectively served 13 percent of their respective retail electrical sales with renewable power. The percentages for each utility are listed below (CPUC 2010):

	2008	2010
▪ PG&E	11.9 percent	17.7 percent
▪ SCE	15.5 percent	19.4 percent
▪ SDG&E	6.1 percent	11.9 percent

The number of renewable energy projects that have been brought on-line is currently below the levels needed for utilities to meet their 2010 and 2020 targets. In order for California's utilities to meet RPS requirements, additional renewable energy projects are needed.

In 2006, the State of California passed the California Global Warming Solutions Act (Assembly Bill 32 or AB32), which requires California to reduce its emissions of carbon dioxide and other GHGs by 25 percent to meet 1990 levels by 2020. Legislation was also enacted in 2006 (Senate Bill 1368), which prohibits California electric utilities from constructing power plants or entering into long-term contracts to buy energy from power plants that do not meet a GHG emissions standard.

In September 2009, Governor Schwarzenegger issued Executive Order S-21-09, increasing the RPS target to 33 percent by 2020. Executive Order S-21-09 requires "that the ARB [California Air Resources Board] under its AB32 authority, shall adopt a regulation consistent with the 33 percent renewable energy target established in Executive Order S-14-08 by July 31, 2010 [and] that the ARB shall work with the PUC [California Public Utilities Commission] and the CEC [California Energy Commission] to ensure that a regulation adopted under authority of AB32 to encourage the creation and use of renewable energy sources shall build upon the RPS program and shall regulate all California load serving entities, including IOUs, publically owned utilities, direct access providers, and community choice aggregators."[2]

On November 24, 2009, the ARB issued a Preliminary Draft Regulation (PDR), which would set up a cap-and-trade program to achieve the goals of AB32. The PDR initiated a rulemaking process that will result in the issuance of final regulations in October 2010. The cap-and-trade program will start in 2012 and will initially apply to 600 of the State's largest GHG emitters, which are primarily electrical power generating facilities and large industrial sources. By placing a price on the right to emit GHGs, the cap-and-trade program will induce a shift to electrical power generation systems and industrial processes that do not use fossil fuels, such as solar energy.

City of Los Angeles Energy Policies

On June 29, 2004, the Los Angeles City Council passed Resolution 03-2064-S1 requesting that the Board of Water and Power Commissioners adopt an RPS policy of 20 percent renewable energy by 2017. On May 23, 2005, the LADWP Board of Commissioners adopted an LADWP RPS Policy that established the goal of increasing the amount of energy LADWP generates from renewable power sources to 20 percent of its energy sales to retail customers by 2017 with an interim goal of 13

[2] Executive Order S-21-09.

percent by 2010.[3] On June 29, 2005, the Los Angeles City Council approved the LADWP RPS policy.[4] In December 2005, the LADWP Board of Commissioners recommended that LADWP accelerate its RPS goal to obtain 20 percent renewable energy by 2010.[5] This was approved by resolution in April 2007 and represented the LADWP continued commitment to renewable resource supply as requested by City Council Resolution 03-2064-S1. As stated in the Integrated Resource Plan, "In May 2007, Los Angeles Mayor Antonio R. Villaraigosa set several new goals for the City of Los Angeles and for the LADWP. These goals include reducing the City of Los Angeles' greenhouse gas emissions to 35 percent below 1990 levels by 2030. Additional goals for LADWP include increasing the use of renewable energy to 35 percent by 2020, and no renewal of power contracts from coal-fired power plants."[6]

LADWP is currently engaged in an integrated resource planning process to identify specific goals for procuring renewable resources and the best strategies for achieving those goals. This planning process is discussed in more detail in Section 3.1.3 of this POD.

Project Will Help Meet Federal, State, and Local Energy Policy Objectives

The Soda Mountain Project is the type of project needed if California's utilities are to achieve federal, state, and City of Los Angeles goals with respect to reducing emission of GHGs and increasing the use of renewable resources. Consistent with the above-mentioned federal, state, and City of Los Angeles policies, the Project will generate electrical power using a renewable resource (i.e., solar energy), which will be sold to one or more utilities.

The Project will thereby help fulfill the important federal and state energy policy objectives, while providing California with clean, safe, reliable power from a renewable resource.

1.2.5 PROJECT SITE CHARACTERISTICS

The site proposed for the Project has a number of favorable characteristics that make it suitable for the development of a solar electrical power generating facility:

- High average daily solar radiation
- No known environmental restrictions on use of the site
- Relatively flat terrain
- Proximity to major transmission lines
- Proximity to vehicular access
- Availability for this use

Based on an extensive analysis conducted by Solenergis (prior to CSM involvement), a relatively small percentage of the land in the desert southwest satisfies all of these criteria. The quality of the solar energy resource at the Soda Mountain site is extraordinarily high due to low annual cloud

[3] LADWP 2007 Integrated Resource Plan, December 2007, Reference D-4.
[4] LADWP 2007 Integrated Resource Plan, December 2007, Reference D-4.
[5] LADWP 2007 Integrated Resource Plan, December 2007, page 5.
[6] LADWP 2007 Integrated Resource Plan, December 2007, page 5.

cover and low humidity. The annual average radiation striking collectors mounted on a one-axis tracking system is 8,100 watts per square meter per day, close to the highest that can be achieved anywhere in the United States. By using the best solar sites, such as the one proposed for the Project, the California RPS requirements can be met most cost-effectively, requiring fewer projects, and using less land.

1.2.6 PROJECT OBJECTIVES

The proposed Project has six primary objectives to meet the above-stated purpose and need:

1. Create an economically viable source of clean renewable electricity generation
2. Provide power to help California's utilities meet the growing demand for electrical power
3. Locate the Project near existing transmission lines to facilitate interconnection
4. Meet Project need while minimizing environmental impacts
5. Provide renewable energy that assists California utilities meet RPS targets
6. Provide a source of renewable energy that fulfills many federal energy policies

CSM considered these objectives in developing a range of alternatives to the Project and Project location. CSM determined that the proposed Project is the best alternative to meet these objectives.

1.3 General Facility Description, Design, and Operation

1.3.1 PROJECT LOCATION, LAND OWNERSHIP, AND JURISDICTION

The proposed Project is located entirely on BLM land in southern California, northeast of Barstow, California, approximately 6 miles southwest of the town of Baker. The site straddles I-15, an interstate highway that connects southern California and the Las Vegas area.

Solenergis (prior to CSM involvement) engaged in a detailed site selection process covering a major portion of southern California prior to selecting the Soda Mountain site. An initial screening indicated approximately 20 areas of interest in southern California. Figure 1.3-1 shows the regional land ownership in the vicinity of the Project site. A second-stage site selection analysis, which included site visits, reduced the list to five sites:

- East of the western Soda Mountains (the proposed Project site)
- Northeast of the Stepladder Mountains
- West of the Stepladder Mountains
- Between the Old Woman and Turtle Mountains
- Near Shadow Mountain/Ivanpah

Aside from the Soda Mountain site, none of the above sites was suitable for the development of a solar power project, primarily due to environmental considerations. The Soda Mountain site was the only site that emerged as suitable for the development of a solar power facility selected for the Project. This site is located on lands managed by the U.S. Department of the Interior, BLM Barstow Field Office. Figures 1.3-2 and 1.3-3 show views of this Project site.

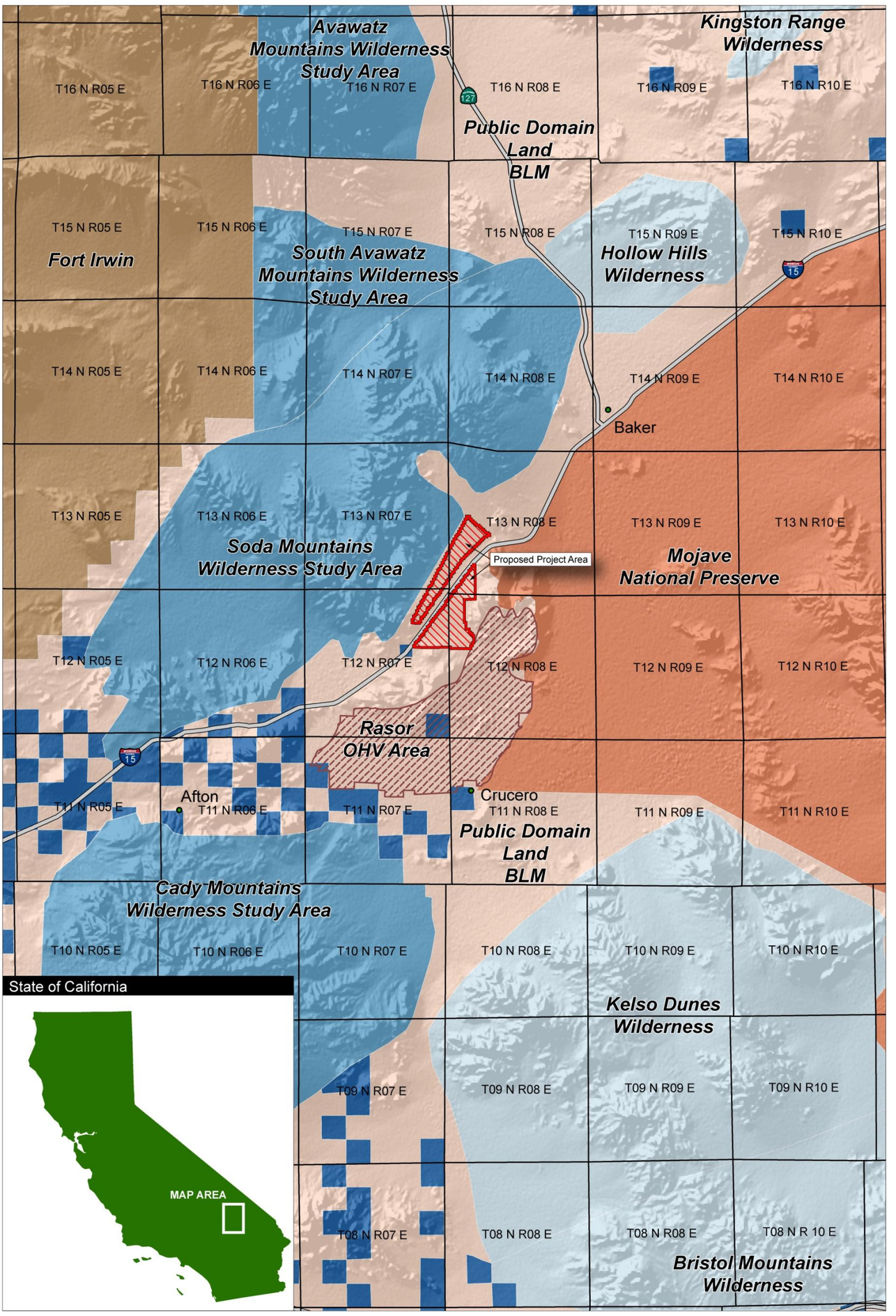


Figure 1.3-1: Regional Land Ownership

Figure 1.3-2: View North From Rasor Road of the Soda Mountain Project

Figure 1.3-3: View Southeast from I-15 of the Soda Mountain Project Site

1.3.2 LEGAL LAND DESCRIPTION

The Project ROW was designed using the Public Land Survey System (PLSS) (National Atlas 2011). The PLSS subdivides and describes land in the United States. The full legal description of the Project site area, identified to ¼, ¼, ¼, ¼ section detail, is located in Appendix A. Figure A-1 identifies the revised ROW and the townships, ranges, and sections that will be occupied by the Project. The ROW area has been modified to avoid encroachment of the Rasor Road Off-Highway Vehicle (OHV) recreation area, Blue Bell Mine Road, utility ROWs, and the I-15 ROW. Details of the ROW modifications are included on Figure 1.1-6 and on Figure A-2 in Appendix A.

- T12N, R7E—Sections 1, 2 (portion), 12, San Bernardino Baseline and Meridian (SBBM)
- T13N, R7E—Sections 25 (portion), 35 (portion), 36, SBBM
- T12N, R8E—Sections 6 (portion), 7 (portion), SBBM
- T13N, R8E—Sections 17 (portion), 18 (portion), 19, 20 (portion), 30, 31, SBBM

For those sections where only a portion is being considered for ROW application, the excluded portion is restricted due to topographic or land-use considerations.

There are no non-federal in-holdings or privately owned lands located within the Project site. An exception may be the California Department of Transportation (Caltrans) ROW. Caltrans maps (a representative map is shown in Appendix A) were used in siting the Project facilities. Caltrans was also consulted in preparation of the corridor study. BLM will formally consult with Caltrans to ensure the CSM ROW does not encroach on the Caltrans ROW.

1.3.3 ACREAGE AND DIMENSIONS OF FACILITIES AND COMPONENTS

Project Layout

The proposed Project layout, and the associated construction and operational factors related to this layout, are based on the use of polycrystalline technology for the solar arrays (Figure 1.1-3). Because the solar industry is rapidly evolving, CSM plans to monitor the development of future technologies and make adjustments to the proposed Project where appropriate to take advantage of improvements in technology, costs, reliability, and related factors. New technology or engineering refinements may require some modification of acreage requirements.

Figure 1.1-3 illustrates a macro-scale layout of the Project, which would involve installing approximately 1.5 million solar panels on approximately 31,500 tracker array assemblies as described in detail below.

Major components of the Project include:

- PV arrays, inverters, medium-voltage collector transformers, and ancillary equipment
- Unpaved access roads between the arrays
- 34.5-kV collector lines to connect the panel arrays to the substation
- A substation and switchyard for interconnection to the transmission system
- Wells, water storage tanks (further discussed in Section 1.3.6), and possibly treatment equipment

- Buildings – control room/office building, maintenance facility, storage warehouse, and other ancillary structures
- Temporary construction areas – temporary storage facility for materials and supplies required during construction
- Channels and diversionary structures associated with hydrology management
- Relocation of Rasor Road and installation of adjacent hydraulic structures for drainage management

The layout of the proposed buildings is shown in Figure 1.1-4. The area covered by the Project's ROW application is approximately 7 square miles. The Project facilities were sited in areas most suitable for construction. Not all of this area is required for Project facilities and operations. Some reduction in the ROW area may be appropriate during the environmental review or final design.

Table 1.3-1 summarizes estimates of temporary and permanent surface disturbance required for Project components. Table 1.3-2 shows the methodology for the calculations. Actual temporary surface disturbance will likely be less.

Power Plant Facilities and Thermal Conversion Process

The Project will use flat-plate polycrystalline PV panels and will not employ a thermal power conversion process.

Solar Power Generation System

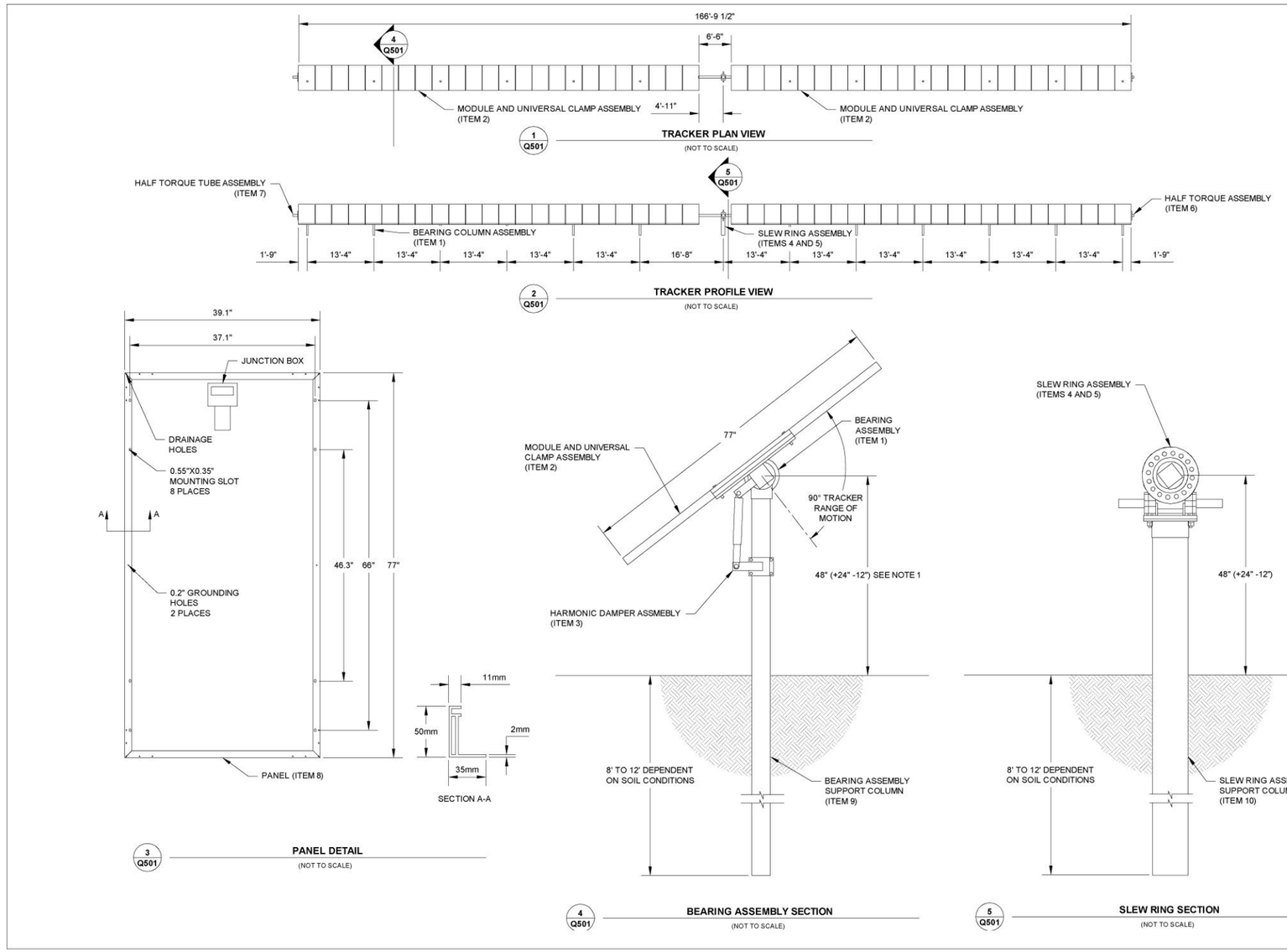
The infrastructure described below is proposed for the Project based on the 30-percent design of the site. During final design, the configuration and number of components will likely vary from those presented below, but will be in general conformance with the land coverage and energy production presented.

Choice of PV Technology

CSM evaluated both thin-film and polycrystalline PV technology. Both technologies convert sunlight directly into electricity in a thin semiconductor. A polycrystalline panel is an assembly of several crystalline silicon wafers, each one of which is a small power-producing cell. Thin-film panels do not have individual cells and are manufactured through various vapor deposition processes. Thin-film panels are typically constructed with copper indium gallium selenide, cadmium telluride, or amorphous silicon. Polycrystalline panels are more efficient than thin-film panels in the conversion of sunlight into electricity and, therefore, require substantially less collector area (and less land) than thin-film panels to produce the same amount of power.

Historically, the installed base of solar photovoltaic systems was dominated by crystalline silicon systems. As such, there is an established track record for crystalline silicon PV systems. CSM selected polycrystalline technology for this Project based on its greater efficiency, lower land use requirements, and proven durability.

Figure 1.3-4: Tracking System Details



MATERIAL LIST

ITEM	QTY*	UNIT	DESCRIPTION
1	12	EA	BEARING ASSEMBLY: 4" DIAMETER
2	2	EA	MODULE AND UNIVERSAL CLAMP ASSEMBLY: EACH ASSEMBLY HOLDS 24 PANELS
3	2	EA	HARMONIC DAMPENER ASSEMBLY: 4" DIAMETER
4	1**	EA	DRIVING SLEW RING ASSEMBLY: 8" DIAMETER
5	1**	EA	LINKED SLEW RING ASSEMBLY: 8" DIAMETER
6	1	EA	HALF TORQUE TUBE ASSEMBLY: 82.0' LONG
7	1	EA	HALF TORQUE TUBE ASSEMBLY: 86.0' LONG
8	48	EA	PANEL: SUNTECH PLUTO300-Vdm POLY-CRYSTALLINE SOLAR PANEL
9	12	EA	BEARING ASSEMBLY SUPPORT COLUMN
10	1	EA	SLEW RING ASSEMBLY SUPPORT COLUMN

* QUANTITIES ARE PROVIDED ON A PER TRACKER BASIS FOR WATTSUN MICRO MEGA WATT HORIZONTAL BEAM TRACKER.

** 1 DRIVE SLEW RING ASSEMBLY AND 21 LINKED SLEW RING ASSEMBLIES ARE REQUIRED FOR EACH TRACKING ARRAY SEE SHEET Q401.

NOTES

1. DRIVE EACH SUPPORT COLUMN TO THE REQUIRED HEIGHT AND DEPTH WITHIN ± 1/4" OF A LASERED CONSTRUCTION LINE BETWEEN THE TWO END SUPPORT COLUMNS.

SOURCE: RMT Inc. 2009

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Table 1.3-1: Estimated Temporary and Permanent Surface Disturbance

	Temporary Area of Disturbance Acreage	Permanent Area of Disturbance Acreage
North Array	602	589
East Array	393	380
South Array	1,747	1,722
Subtotal Arrays	*2,742*	*2,691*
Substation	10	5
Operations &Maintenance [O&M] Buildings, Warehouses, and Water Tank	4	1
Project Well	0.5	0.5
Rasor Road Realignment	60	12
Access Roads	64	7
Channels	55	17
Diversion Structures	11	3
Collector Routes	38	0
TOTAL	***2,985***	***2,737***

Table 1.3-2: Surface Disturbance Calculation Methodology

	Temporary Area of Disturbance	Permanent Area of Disturbance
North Array	30-foot buffer around fence line	Within fence line
East Array	30-foot buffer around fence line	Within fence line
South Array	30-foot buffer around fence line	Within fence line
Substation	100-foot buffer around footprint	Footprint
O&M Buildings, Warehouses, and Water Tank	Irregular boundary around facilities and access corridors	Area around building footprints and water tank
Project Well	Well pad	Well pad
Rasor Road Realignment	100-foot buffer from centerline (excludes work areas that overlap temporary disturbance buffers of above Project components)	19-foot buffer from centerline for a 38-foot-wide road

Table 1.3-2 *(Continued)*: Surface Disturbance Calculation Methodology

	Temporary Area of Disturbance	Permanent Area of Disturbance
Access Roads	100-foot buffer from centerline (excludes work areas that overlap temporary disturbance buffers of above Project components)	8-foot buffer from centerline for 16-foot-wide roads (excludes areas that overlap permanent disturbance areas of above Project components)
Channels	100-foot buffer from centerline (excludes work areas that overlap temporary disturbance buffers of above Project components)	13-foot buffer from centerline (approximately 26-foot-wide diversion structure or less)
Diversion Structures	40-foot buffer from centerline (excludes work areas that overlap temporary disturbance buffers of above Project components)	10-foot buffer from centerline for an approximately 20-foot-wide diversion structure (excludes areas that overlap permanent disturbance areas of above Project components)
Collector Routes	50-foot buffer, does not include Caltrans ROW where routes will be bored (excludes work areas that overlap temporary disturbance buffers of above Project components)	Collector routes will be trenched and reclaimed

PV Panels

Power will be produced in approximately 1.5 million polycrystalline flat-plate PV panels, each rated at 300 watts, with approximate dimensions of 3.3 feet by 6.4 feet.

One-Axis Trackers

The panels will be attached to an approximately 167-foot-long, one-axis linear tracker oriented north-south so that the panels will follow the sun across the sky from east to west over the course of the day. Forty-eight to 54 panels will be mounted in a row on each tracker. The tracker rotates so that the panels face east in the morning, are horizontal at midday, and face west in the afternoon. The trackers will be mounted on corrosion-resistant support posts spaced 13.3 feet on center. These support posts will be buried in the desert floor, as shown on Figure 1.3-4.

Tracker Assemblies

For the Project, approximately 1,440 tracker assemblies will be employed, each one consisting of 22 individual trackers driven by a single motor through a ganged actuator. Separation of the trackers will be 16 feet on center, allowing a minimum of 9.7 feet clearance between the panels on adjacent trackers. Figure 1.3-5 shows an example of a one-axis tracking system in place at Twentynine Palms Marine Corps Base.

Figure 1.3-5: Twentynine Palms Marine Corps Base PV Panels

SOURCE: URS 2009

One-Megawatt Blocks

The tracker assemblies will be grouped into blocks, each one of which will contain four tracker assemblies and generate 1 MW of power. Typical block layouts are depicted in Appendix B. Each block will feed power to two 500-kilowatt inverters. Each 1 MW block (including the buffer around it for stormwater drainage, if necessary) and access roads will occupy an area of approximately 270,000 square feet (724 feet by 373 feet). This yields an approximate land coverage ratio of 33 percent (i.e., ratio of total collector surface area divided by land area occupied by solar arrays is 0.33).

Figure 1.3-6 shows anticipated power flow from array groups to inverters, to medium-voltage transformers, and through 34.5-kV collection lines to the substation.

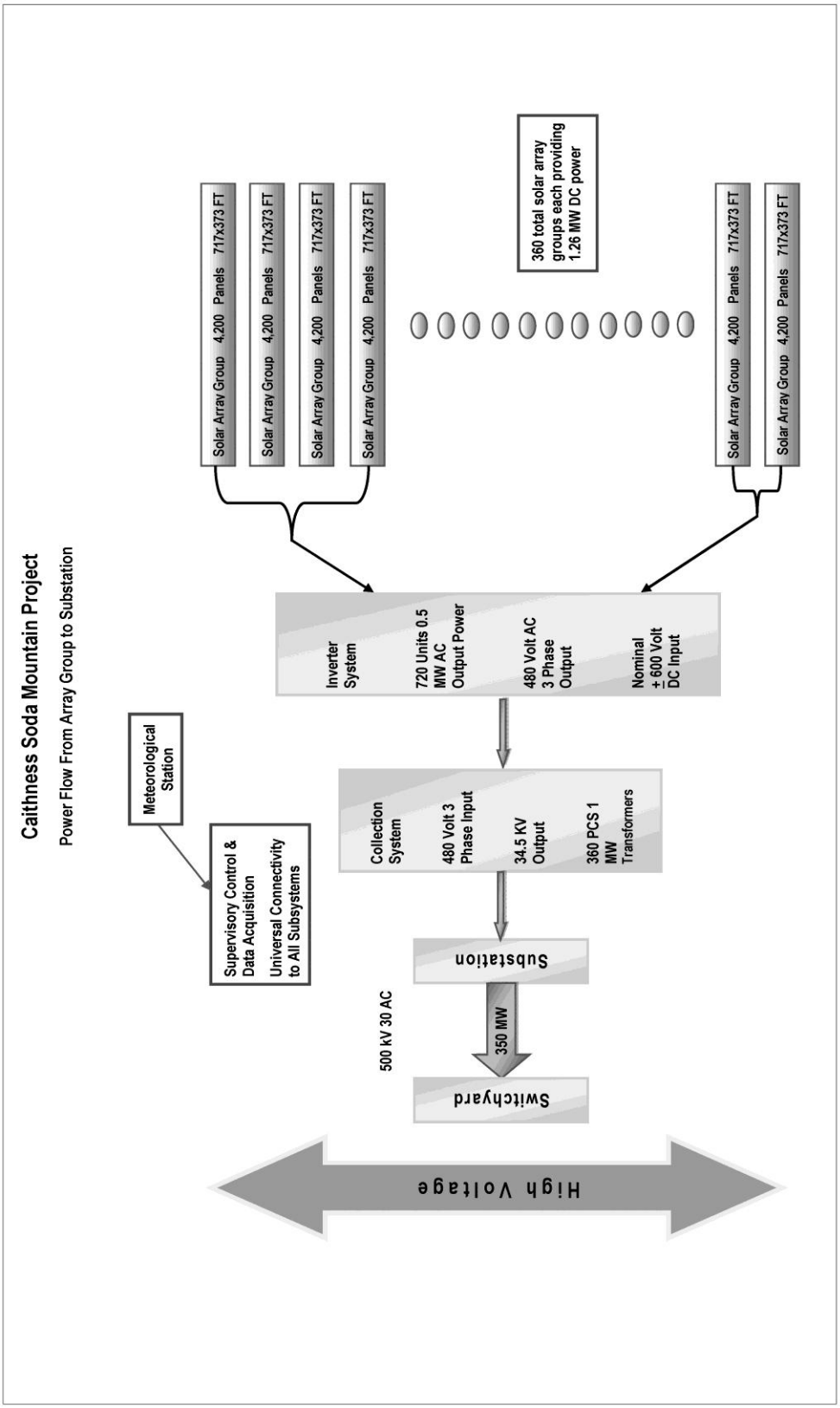
Inverter/transformer Pads

The inverters will convert the DC power generated in the panels into AC. Medium-voltage transformers will convert the 480-V, three-phase AC power output from the inverters into 34.5-kV AC for transmission to the substation. Each medium-voltage transformer will be rated at 1 MW and accept the output of two inverters. A total of 720 inverters and 360 medium-voltage transformers will be needed for the Project. The two inverters and one medium-voltage transformer associated with each block will be mounted adjacent to each other on a single 15-foot-by-29-foot concrete pad.

Towers

Solar power towers, needed for certain types of solar thermal generating facilities, are not a part of the proposed Project. CSM is proposing the use of underground cables for this Project.

Figure 1.3-6: Power Flow from Array Group to Substation



Substation

A 500-kV transmission line owned by a consortium of municipal electric utilities and managed by LADWP runs parallel to I-15 on the west side of the interstate. Use of this line is being actively considered for interconnection of the Project to the grid. The Project substation is planned to be located to the northwest of I-15 adjacent to the LADWP transmission line ROW. The exact location and details of the interconnection are contingent on results of interconnection studies that are part of the transmission interconnection request process conducted by LADWP. According to the June 2009 Feasibility Study conducted by LADWP with respect to the interconnection of this Project to the 500-kV line, "the proposed method of interconnection to the Market Place-Adelanto Transmission Line would consist of approximately one-mile 500-kV loop-in to the Project switchyard." The interconnection is further discussed in Section 3.1.

Figure 1.3-7 shows the view northwest from I-15 toward the power lines. The 500-kV and 115-kV transmission lines are shown on metal towers in the distance. Lines in the foreground of the photo on wooden poles are distribution lines.

Transmission and Collection Lines

Other than interconnection with the existing transmission lines discussed above, new transmission lines are not required.

Within the Project site, 34.5-kV, three-phase cables will transfer electricity from the output side of the medium-voltage transformers at the solar panel arrays to the substation. These cables are referred to in this document as "medium-voltage collection lines" or "collector lines." The collection lines may be overhead or underground. The type of line and the location of the lines will be determined during the final design phase. The possible collection line locations connecting to the substation are shown in Figure 1.1-3. Collection lines within the panel arrays are not shown.

The 34.5-kV collection lines will terminate at the proposed high-voltage transformer substation located on the northwest side of I-15. Medium-voltage collection lines from the east side of the site

Figure 1.3-7: Existing Power Lines West of I-15

SOURCE: URS 2009

will be routed to the substation under the freeway using a jack-and-bore or directional drilling system that will avoid effects on freeway operations. Buried or pole-mounted collection lines will route the power to the substation from the freeway undercrossing. Buried collection lines will be used at all the other locations. Power will then be fed at 500 kV to the switchyard located adjacent to the LADWP transmission line. The Project will require modification of the existing transmission lines for the interconnection.

Access Roads

Roadways are shown in Figure 1.3-1. Road plans and cross sections are shown in Figure 1.3-8 and in Appendix B: 30-Percent Design Submittal.

Rasor Road will be used as the primary access route to the Project area on the southeast side of I-15. This roadway will be relocated on the south side of the ROW area as part of the construction undertaken for the Project. CSM proposes that relocated Rasor Road be a 26-foot-wide, two-lane, unpaved road located along the southern Project boundary.

Long-term access to the Project O&M area in Township 12N, Range 7E, Section 12, SBBM, will be provided through a gated entrance off relocated Rasor Road. Internal access to the PV blocks will be provided for low-impact vehicles along the same corridors used for construction access. Spacing between arrays provides adequate space for maintenance access and will serve as unimproved roads for vehicular access.

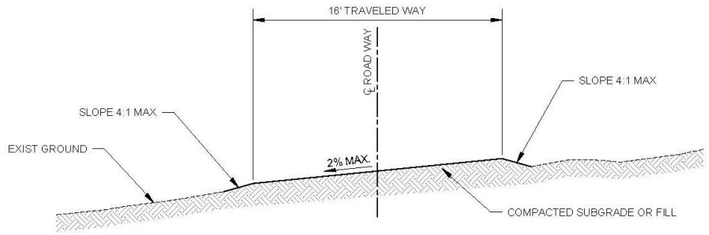
Access to the portion of the Project site on the northwest side of I-15 will be provided via Zzyzx Road and Arrowhead Trail off of the Zzyzx Road interchange with I-15, in the northeast portion of the Project site.

Existing Access Roads

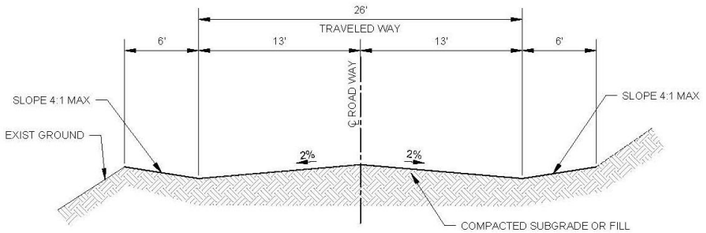
A Caltrans mineral materials site (Opah) is located to the northwest of I-15. The Caltrans access road runs through the proposed ROW; however, due to the condition of the uneven terrain, no arrays are planned for this area. The Project ROW also takes into consideration the proposed expansion of the Opah materials site. This existing road may be used periodically for construction of the collection line to the substation or Project access. Project development is not expected to affect issues in relation to the minerals site; however, this will be further addressed during the environmental review period.

BLM's records (see http://www.geocommunicator.gov/blmMap/Map.jsp?MAP=MC) show that there are mining claims within Sections 17 and 20; however, the Project ROW is located to the south of Blue Bell Mine Road and the Project will not affect access to active mining claims north of Blue Bell Mine Road.

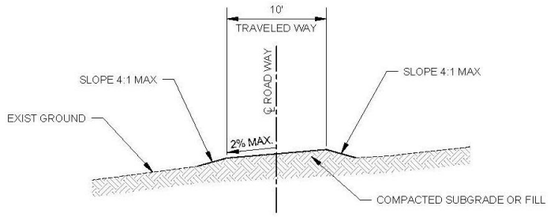
Figure 1.3-8: Access Road Typical Details



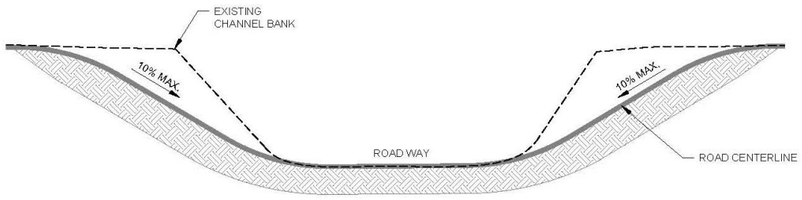
1 C501 **ARTERIAL & MAIN ACCESS ROAD**
(NOT TO SCALE)



4 C501 **RASOR ROAD CROSS SECTION (PUBLIC ROAD)**
(NOT TO SCALE)



2 C501 **MAINTENANCE ROAD**
(NOT TO SCALE)



3 C501 **ACCESS ROAD CHANNEL CROSSING CROSS SECTION**
(NOT TO SCALE)

NOT FOR CONSTRUCTION

MATERIAL LIST

ITEM	QTY	UNIT	DESCRIPTION

NOTES

ARTERIAL, MAIN ACCESS, AND MAINTENANCE ROADS

1. CONSTRUCT ACCESS ROADS PER PLAN WITH AN INSIDE ROAD RADIUS OF NO LESS THAN 25'.
2. EXCAVATE A MINIMUM 3" OF TOPSOIL (NOT ANTICIPATED) AND VEGETATIVE COVER, IF ANY, AND THIN SPREAD ADJACENT TO ROAD TO MATCH EXISTING GRADES.
3. IF UNSUITABLE SUBGRADE SOIL IS ENCOUNTERED, REMOVE, REPLACE, AND COMPACT WITH SUITABLE FILL AS DIRECTED BY ENGINEER.
4. GRADE IN DIRECTION OF TRAVEL SHALL NOT EXCEED 10%.
5. COMPACT SUBGRADE TO A DRY DENSITY OF AT LEAST 90% OF THE MAXIMUM DRY DENSITY, AS DETERMINED BY THE MODIFIED PROCTOR TEST.
6. DO NOT ALLOW STANDING WATER ON SUBGRADE OR ACCESS ROADS. SURFACE WATER THAT MAY ACCUMULATE IN ROADWAY AREAS IS TO BE REMOVED.
7. MAINTAIN ROADWAY SURFACE AS NECESSARY PER SPECIFICATIONS TO ENSURE THAT THE SURFACE REMAINS IN GOOD CONDITION, HAS POSITIVE DRAINAGE, AND IS SUITABLE FOR CONSTRUCTION AND POST-CONSTRUCTION TRAFFIC.

RASOR ROAD

1. CONSTRUCT ACCESS ROADS PER PLAN WITH AN INSIDE ROAD RADIUS OF NO LESS THAN 25'.
2. EXCAVATE A MINIMUM 3" OF TOPSOIL AND VEGETATIVE COVER, IF ANY, AND THIN SPREAD ADJACENT TO ROAD TO MATCH EXISTING GRADES.
3. IF UNSUITABLE SUBGRADE SOIL IS ENCOUNTERED, REMOVE, REPLACE, AND COMPACT WITH SUITABLE FILL AS DIRECTED BY ENGINEER.
4. PROVIDE GRADING AND / OR DITCHING TO MAINTAIN EXISTING DRAINAGE PATTERNS AND TO PROVIDE POSITIVE DRAINAGE FROM ROADWAY SURFACE.
5. COMPACT SUBGRADE TO A DRY DENSITY OF AT LEAST 90% OF THE MAXIMUM DRY DENSITY, AS DETERMINED BY THE MODIFIED PROCTOR TEST.

NO.	DATE	REVISION	BY	CHK'D	APV'D
b	2/17/11	35% DESIGN SUBMITTAL	SRC	JMO	NHV
a	12/1/09	30% DESIGN SUBMITTAL	METZ	ABO	NHV

RMT
744 Heartland Trail
Madison, WI 53717-1934
P.O. Box 8923 53708-8923
Phone: 608-831-4444
Fax: 608-831-3334

SODA MOUNTAIN SOLAR PROJECT SAN BERNARDINO COUNTY, CA

ACCESS ROAD TYPICAL DETAILS

SCALE:	PROJ. NO.	DWG. NAME	SHT. NO.
AS SHOWN	8406.05	DETAILS-CAITHNESS.dwg	C501

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Fencing

The perimeter of the Project area will be fenced to limit unauthorized access. Permanent 7-foot-high, gated chain-link security fences will be constructed around the Project substation and the array fields. Safety and warning signs informing the public of construction and operations activities will be posted at the Project access point on the central access road, and at regular intervals along the ROW perimeter fence. Fence details are shown in Appendix B.

Buildings

The following buildings will be constructed as part of the Project.

- O&M Building – approximate dimensions: 50 feet by 100 feet
- Maintenance Facility – approximate dimensions: 40 feet by 60 feet
- Storage/Warehouse Facility – approximate dimensions: 60 feet by 100 feet

Maintenance and operations buildings will be located in a facilities area sited at the primary entrance to the Project area off existing Rasor Road. It is anticipated this area would be located within the ROW closest to the interchange of Rasor Road and I-15. The control room/office building will be designed to conform to Leadership in Energy and Environmental Design (LEED) certification criteria.

Parking Areas

Parking areas will be located adjacent to the buildings. The parking areas are not expected to exceed about 0.33 acres, or 13,200 square feet. Parking will be provided for the maximum anticipated 38 regular employees during Project operations, visitors, and for other vehicular equipment anticipated to be on the site at any one time. Project staffing is further discussed in Sections 2.4.1 and 4.3.

Water Well and Pipeline

CSM conducted a groundwater investigation (RMT 2011b) and proposes to site two wells in the Project area. The potential well sites may be located along the road on the north end of the North Array (Figure 1.1-3). A pipeline would carry water from the well location in the North Array to the administration building. Based on site characteristics, CSM may propose to drill a well in the vicinity of the administration building.

Temporary Construction Workspace, Yards, and Staging Areas

The construction staging area is planned to occupy 30 total acres within the ROW. CSM anticipates having two 15-acre staging areas, one on either side of I-15. Additional areas within the panel footprints may be used for staging during construction.

1.3.4 TECHNICAL STUDIES AND DATA NEEDS

As-Needed Engineering Design

Final Engineering

The 30% engineering design studies considered foreseeable physical conditions at the site and developed plans for dealing with the conditions. Should unforeseen problems occur that require amending the proposed construction or operational methods or facilities, CSM will identify these issues as early as practical during final design, and work with the BLM and responsible agencies to implement any necessary Project changes in a manner acceptable to the BLM.

30-Percent Engineering

CSM's contractor, RMT, prepared the PV Plant Infrastructure Construction Drawings 30-Percent Submittal depicting the current engineering plans as of November 2009 (Appendix B). Subsequent to preparing the 30-percent submittal, RMT conducted several geologic investigations, hydrologic modeling, and groundwater modeling. These additional investigations and studies generally confirmed that feasibility of the 30-percent design. Further stormwater analysis suggests, however, that many of the stormwater controls provided in the 30-percent design (such as the detention pond and numerous ditches in the panel areas) may not be necessary. Instead of issuing a completely updated design at this time, selected sheets were revised and provided to convey the design changes resulting from the revision of this POD (Appendix B).

Soil Assessment/Geology and Faults

The U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx) has mapped soil units in the Project area. The Project site is located within three soil survey areas:

1. Mojave Desert Area, California
2. Mojave Desert Area Northwest Part, California
3. Mojave National Preserve

Based on a review of the Web Soil Survey areas noted above, the soil types in the vicinity of the Project are identified as NOTCOM. NOTCOM is described as "mapping not complete" or "Obsolete Term for Unmapped Areas." Additional soil databases were searched; however, no data were found for the Project site.

CSM's contractor contacted the NRCS Victorville Service Center to obtain access to any potential historical soils data, such as a 1970 SW Desert Area General Soils Report.. The data from this survey do not provide accurate soils data for the Project region (Fahnstock 2009). Based on the geologic map (Figure 1.3-9), the Project site overlies various alluvial units. Figure 1.3-10 shows the active and potentially active faults within the region.

Geologic, geophysical, and geotechnical investigations were conducted on the site in 2010 to evaluate the types and nature of the on-site soils. The soil assessment provided information to determine the appropriate method for anchoring the solar panel supports to the ground, and for

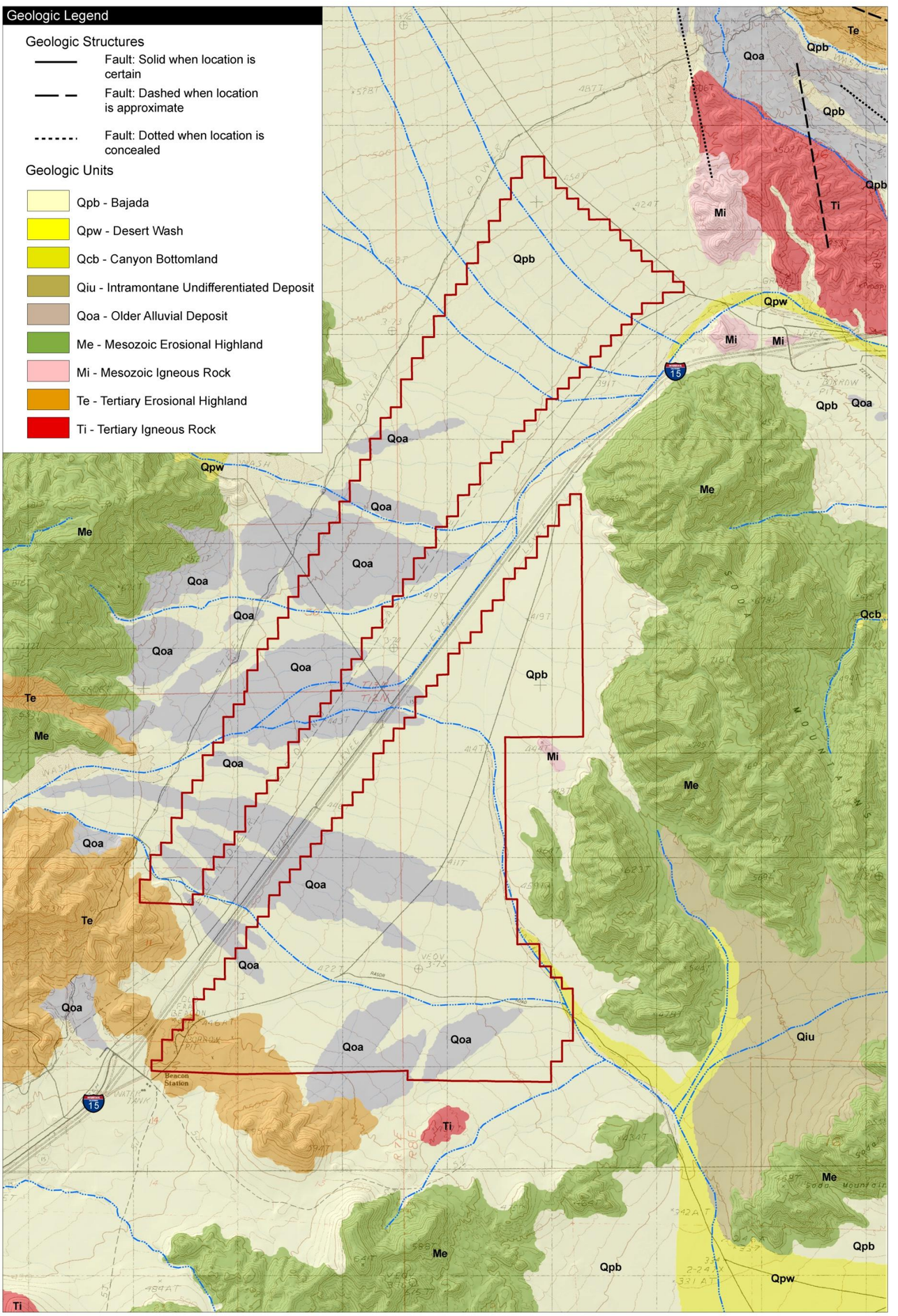
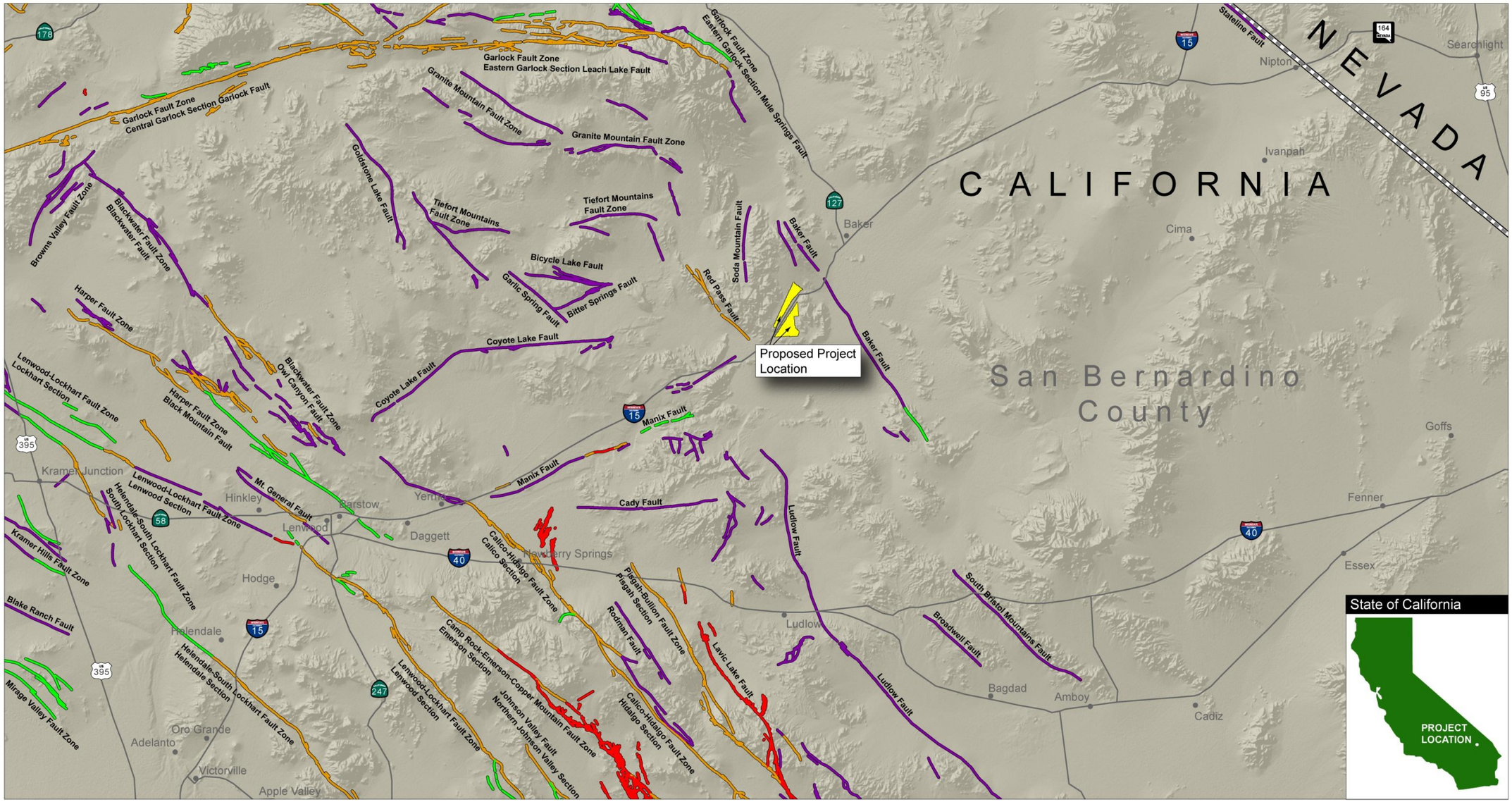


Figure 1.3-9: Geologic Map

Figure 1.3-10: Active and Potentially Active Faults in the Proposed Project Region



foundations for the inverters, trackers, and transformers. Based on preliminary surface examination and general knowledge of the region, CSM expects that most of the solar panel support posts can be installed through vibratory insertion. Some locations may require pre-boring and grouting in place or modest concrete anchorage, such as a concrete ballast foundation. Other equipment will be placed on spread footing concrete pads. CSM completed additional geotechnical and geophysical field surveys in 2010 based on direction from BLM hydrologists received in March 2010. The primary objective of the 2010 geologic surveys was to increase the geotechnical knowledge of the Project site.

Geologic Characterization Report

Existing data regarding geologic conditions were gathered and are presented in a geologic characterization report (Wilson Geosciences, Inc. 2011). The report describes the existing setting, including physiography, geologic units, soils, faults and seismicity, mineral resources, and geologic hazards. Detailed mapping of the alluvial units in the Project area was conducted to understand drainage and erosion potential of the soils in the Project area. The report includes an assessment of the potential for erosion and geologic hazards. The site is considered suitable for the construction of the proposed Project.

This report is submitted to the BLM with this revised POD (listed in Appendix C).

Geophysical Study

Terra Physics (2010) conducted a geophysical study using five geophysical techniques to characterize subsurface physical properties of the Project area and to develop stratigraphic correlations with nearby geotechnical soil borings. The geophysical study was conducted to aid in Project engineering and groundwater modeling.

This report is submitted to BLM with this revised POD (listed in Appendix C).

Geotechnical Study

Diaz-Yourman & Associates (DYA) conducted a geotechnical investigation and prepared a Preliminary Geotechnical Investigation (Phase 1A) Report for the Project site (DYA 2010). The investigation was conducted to provide geotechnical input for the preliminary design of the proposed Project. The investigation consisted of drilling 14 shallow soil borings and one deep soil boring. The borings were used for seismic tests and in-hole permeability tests. Boring materials were sampled to determine engineering properties, fertility, and thermal resistivity. The site is considered suitable for construction of the proposed Project.

This report is submitted to BLM with this revised POD (listed in Appendix C).

Geologic Field Reconnaissance Report: Percolation, Stormwater Runoff, and Channel Scour Potential

RMT conducted additional geological field work to evaluate the potential for erosion and percolation in the area. The study was focused into two areas: a percolation evaluation and a channel scour evaluation. The Geologic Field Reconnaissance Report (RMT 2011c) describes the potential for scour throughout the Project site with a focus on erosion occurring at manmade structures installed in the Project area. The scour portion of the study addressed channel flow on

the northwest side of I-15 and at the culverts under I-15. The results of the survey indicate that properly installed structures have little risk of being undermined from surface erosion. The Project has been designed to allow natural, existing stormwater flow and sediment transport to continue, unaltered, and move through the Project site. Off-site stormwater runoff will be routed around the Project site, reducing the chance of on-site erosion. Channel scour and sediment transport would not be affected by Project construction.

The percolation portion of the study addressed overland flow in the upland area above the northwest portion of the Project area. The presence of caliche was also investigated to identify barriers to percolation in the area. Caliche was not found in significant quantities in boreholes and in areas examined in the geologic reconnaissance.

This report is submitted to BLM with this revised POD (listed in Appendix C).

Solar Insolation Testing

No solar insolation testing has yet been conducted at the site. CSM is planning to initiate solar insolation monitoring at or immediately adjacent to the Project site in the near future.

The Daggett solar insolation monitoring station operated by National Renewable Energy Lab (NREL) is located 66 miles from the Project site. Solar insolation at the site is expected to be very close to that at Daggett. The average daily solar insolation measured over a 30-year period at Daggett would lead to a predicted output of 8,400 watt-hours per square meter per day ($Wh/m^2/day$) for the solar energy striking the collector surface of an ideal one-axis tracking system that has no limits on the angular range of tracking and no shading losses.

To get a better forecast of the solar energy that would actually strike the collector surface of the tracking system proposed for this Project, commercially available PVSYST software was used. The solar insolation data that were used in the simulation consisted of NREL's National Solar Radiation Database Typical Meteorological Year dataset. The tracker proposed for this Project has an angular limit of +/-45 degrees from vertical and also backtracks in the early morning and late afternoon hours to avoid shading of the panels. Based on the separation of trackers incorporated in the Project's current tracker assembly design, the PVSYST calculation of the annual average radiation striking collectors mounted on a one-axis tracking system is 8,011 $Wh/m^2/day$. This result is comparable to results achieved independently with NREL's PVWATTS 2 model, which uses satellite solar insolation data compiled by the U.S. Air Force. PVWATTS 2 predicts 8,100 $Wh/m^2/day$ annual insolation in the plane of array.

Preliminary Hydrology and Hydraulic Studies

A Hydrology Study Report (RMT 2009) was prepared and submitted to the BLM (listed in Appendix C) with the 2009 POD. Existing and proposed conditions were studied in detail in the hydrologic analyses for on-site and off-site portions of the proposed Project area. These analyses evaluated storm flow conditions and flow directions using historical data related to precipitation events for different durations and return periods from the San Bernardino County Hydrology Manual, San Bernardino Regional Flood Control District, and the NRCS soils group, as related to

runoff potential. Hydrologic design recommendations necessary for design of the proposed Project were developed and are included in the design reported in this POD.

The Hydrology Study Report (RMT 2009) was prepared to ensure that the proposed Project conforms to San Bernardino County's Hydrology Manual and meets BLM standards for on-site and off-site drainage facilities. The report includes hydrology maps consisting of an aerial photo map, overlain with necessary Project data, showing the on-site and off-site areas and pertinent data related to on-site and off-site areas. In addition, the report includes runoff computations to support the study's findings. Drainage maps of the proposed Project site have been prepared using state-of-the-art software and data.

The Hydrology Study Report was revised (RMT 2011a) to reflect the additional geological field work and testing that was conducted and to address BLM questions and comments on the December 2009 Hydrology Study Report.

The revised Preliminary Hydrology Study Report includes updated graphics, modeling results, and additional information regarding stormwater runoff. The modeling shows that the detention basins incorporated into prior drainage designs are not needed because water will flow through and around the site. In the current design, there are no detention basins, thereby reducing construction impacts of the Project.

Hydrogeologic Conditions and Groundwater Modeling Report

The hydrogeology of the area was studied to develop a groundwater model for the Project vicinity (RMT 2011a). The modeling incorporated the results of the geologic, geophysical, and geotechnical studies. The report describes the hydrogeology of the Project area and presents the results of groundwater modeling. The modeling was used to evaluate the feasibility and potential effects of extracting water from the Project site for dust control and panel washing. The modeling showed that the proposed water extraction would not affect any other water sources, including the Rasor Road service station well (discussed further in Section 1.3.6), Zzyzx Spring, or wells in the town of Baker.

This report is submitted to BLM with this revised POD (listed in Appendix C).

Archeological and Biological Surveys

An archeological survey and several biological surveys were completed and submitted to the BLM in February 2010. Biological surveys were completed for avian species, desert tortoise, Mojave fringe-toed lizards (MFTLs), and special-status plant species. Reports documenting the surveys and their findings were prepared by URS Corporation (URS). The biological reports were prepared to ensure that the proposed Project does not impact species of concern in the Project region. The biological surveys were submitted to the BLM Barstow Field Office for review and were approved as final in 2010. The final reports are submitted to BLM with this POD, and are listed in Appendix C.

1.3.5 ANCILLARY FACILITIES

Administrative and Maintenance Facilities

Proposed buildings were described above in Section 1.3.3 (Figure 1.1-4). Three long-term ancillary buildings will be located in the southwest corner of the southern array field. A septic system will be designed and constructed adjacent to the long-term buildings. The system will be designed in accordance with applicable standards. Plans will be submitted to the appropriate oversight agency. The geologic studies showed that given the available land area and depth to groundwater, a septic system can be constructed and safely operated in accordance with applicable plumbing codes.

Storage Sites

Two of the Project buildings will be used for storage. The permanent warehouse facility will be housed in the main building. The temporary construction storage building will be located adjacent to the permanent warehouse and will have approximate dimensions of 40 feet by 80 feet.

1.3.6 WATER USAGE, AMOUNTS, AND SOURCES

Water Demand and Storage

The site water demand and associated storage will consist of water for potable use, dust control during construction, panel cleaning, and fire protection. General water demand values are shown below in Table 1.3-3.

Water Storage

There will be four water storage tanks on site during construction and three during operation of the Project. One 5,000[7]-gallon potable water supply tank will be located within the office/warehouse ancillary building. To satisfy fire suppression requirements, one 22,500-gallon tank will be located near the office/warehouse building. Additionally, one 42,000-gallon water tank will be located within the vicinity of the southern entrance to the Project site and will store water for panel-washing activities. During construction, one 20,000-gallon water tank will be temporarily located on site.

Table 1.3-3: Soda Mountain Water Demand Estimates

Construction Period	
Construction, Dust Control	55,000 gallons per day, 2-3 years
Operations Period	
PV Panel Washing	42,000 gallons per day, 42 days per year
Potable Supply	1,330 gallons per day, 365 days per year
Fire Suppression	Periodic tank filling of 22,500 gallons

[7] Tank sizes are approximate.

Dust Control

It is estimated that 55,000 gallons per day (gpd), equivalent to 38 gallons per minute (gpm), will be needed for construction and for dust control, based on information provided by RMT's construction team. RMT anticipates that a water tank of 20,000 gallons will be installed on site to store water in anticipation of construction and operational water needs.

Panel Cleaning

Dust and dirt build-up on solar panels reduces the amount of incoming solar radiation striking the active PV layer within the panel. To reduce this effect, panel washing will likely be conducted once or twice per year over a 3-week period during operations. PV panels require an estimated 2,500 gallons per MW per wash; therefore, assuming two washes per year, the annual water required wash water will be:

*2,500 gal/MW/wash * 350 MW * 2 wash/year = 1.75 million gal/year*

Assuming each cleaning will take place during a 21-day period, the average daily water usage for cleaning is:

1.75 million gal/year / 42 day/year = 42,000 gpd (approximately 29 gpm)

To have 1-day storage of cleaning water on hand, a 42,000-gallon panel-cleaning tank will be installed on a high point by the O&M building. The tank will be filled with groundwater and supplemented with trucked-in water pumped to the tank. The water will then drain by gravity to panel-cleaning trucks for use. Depending on groundwater analysis, softening or deionizing of the groundwater may be required for panel cleaning. In this case, portable, trailer-mounted water treatment equipment will be brought on site during washing periods.

Fire Protection

The Victorville Fire Protection office (telephone: 760-843-4375) is responsible for fire code compliance for new construction at the Project site. According to Mr. Doug Crawford, the San Bernardino County Fire Marshal, the County's requirements are more stringent than the state code and, therefore, the County requirements will apply. The County incorporates National Fire Protection Association (NFPA) 1142 and NFPA 13 by reference and, therefore, these are the applicable standards for San Bernardino County. NFPA 1142 provides the minimum required water supply for firefighting where no public water supply is available, and NFPA 13 provides the minimum requirements for sprinkler systems.

The minimum water supply (in gallons) is calculated based on the occupancy hazard, type of construction, structure dimensions (length, width, and height), and exposures as stated in the equation that follows. Where there are multiple buildings, the maximum calculated volume is used. If the minimum volume is less than 5,000 gallons, 5,000 gallons is used.

$$WS_{min} = \frac{VS_{tot}}{OHC}(CC)\ Exposure$$

Where,

WS_{min}	=	water supply minimum
VS_{tot}	=	total structure volume in cubic feet
OHC	=	occupancy hazard classification (from NFPA 1142)
CC	=	construction classification number (from NFPA 1142)
$Exposure$	=	1.0 for buildings greater than 50 feet from the nearest second building and 1.5 for buildings 50 feet or less from the nearest second building

For this site, the input equation input values are shown in Table 1.3-4.

The San Bernardino County requirements for sprinkler systems are defined in NFPA 13. According to NFPA 13, buildings over 5,000 square feet in size are required to have sprinkler systems. The flow rate and duration of the sprinkler system are determined by the building size and hazard classification as provided in Table 1.3-5.

Because the sprinkler storage requirement exceeds the minimum water supply required, the sprinkler storage number is the fire storage requirement for the site, and 22,500 gallons of firefighting water storage is required. This storage will be in a dedicated tank next to the O&M building. It will not require a regular supply of water because the water will only be withdrawn in the case of a fire.

Table 1.3-4: Assumptions for Firefighting Water Storage

Structure	VS_{tot}	OHC	CC	Exposure	WS_{min}
Office Building	50,000 CF (50'x100'x10')	7 (office)	1.0 (assumed)	1.0 (55' to nearest building)	7,142 gal
Storage Facility	72,000 CF (60'x100'x12')	5 (unoccupied building)	1.0 (assumed)	1.0 (55' to nearest building)	14,400 gal
Maintenance Facility	24,000 CF (60'x40'x10')	5 (machine shop)	1.0 (assumed)	1.0 (55' to nearest building)	5,000 gal (min value)
				Controlling Structure (Maximum Value)	***14,400 gal***

NOTE:
CF = cubic feet
gal = gallons

Table 1.3-5: Fire Sprinkler Flow Rate Assumptions

Structure	Building Size	Hazard Classification	Rate	Duration	Sprinkler Volume
Office Building	5,000 SF (50'x100')	Light Hazard Occupancy	500 gpm (assumed automated sprinkler)	30 min	7,142 gal
Storage Facility	6,000 SF (60'x100')	General Storage Class 1-5 Commodities	250 gpm	90 min	22,500 gal
Maintenance Facility	2,400 SF (60'x40')	NA	NA	NA	NA
				Controlling Structure (Maximum Value)	***22,500 gal***

NOTE:
SF = square feet
gal = gallons
NA = not applicable

Potable Supply

The design daily demand for the O&M building is based on the number of employees. Table K-3 of the California Plumbing Code shows the average water demand (for wastewater sizing) for offices is 20 gpd per employee, and the average water demand for factories with shower facilities is 35 gpd per employee. The assumption is made that the potable water needs equal the wastewater generated. To size a potable water storage tank, it was assumed that 38 employees may be present for extended periods, and three days of water will be required. This estimate results in the need for a 5,000-gallon potable water storage tank (38 employees * 35 gpd/employee * 3 days' storage), assuming that potable water must be trucked to the site and not supplied by an on-site well.

On-site Wastewater Treatment System

The California Plumbing Code (CCR Title 24, Part 5 California Plumbing Code 2010 Edition [2009 UPC]) definitions indicate an on-site wastewater treatment system is feasible for the disposal of wastewater generated from the O&M building. According to the geotechnical investigation report (DYA 2010), groundwater, bedrock, or impervious soil does not exist within 12 feet of the ground surface, the site is not located within a flood zone, and the site is large enough to serve the proposed on-site structures with applicable setbacks.

The daily wastewater flow for 38 employees (35 gpd/employee) would be 1,330 gpd. The septic tank size must be 1.5 times the daily flow for flows under 1,500 gpd. This results in a tank size of 1,995 gallons(1,330 gallons per day * 1.5). A 2,000-gallon septic tank is common and readily available from prefabricated tank suppliers in the area.

Twenty-five square feet of leaching area are required per 100 gpd of wastewater in areas of fine sand. This results in a leaching area of 333 square feet (1,330 gallons * 25 square feet per 100 gallons). A leaching area of this size is feasible for the O&M building.

Use of an on-site wastewater treatment system is a feasible method of wastewater disposal for this Project, based on the anticipated volume of wastewater generation.

Water Sources

The Project area, about 6 miles southwest of the unincorporated town of Baker, is situated on several alluvial fans of the Soda Mountains, which are bisected by the I-15 freeway. Elevations range from approximately 1,300 feet above mean sea level (AMSL) in the lower reaches of the valley and rise to 1,575 feet AMSL in the western portion of the area (U.S. Geological Survey [USGS] 1983). Dry lakes occur at lower elevations in the region, such as Soda Lake, located 3 miles from the northern end of the Project area.

Surface Water Drainage Basins

The Project area is located in the upland Mojave Desert region of the South Lahontan Hydrologic Region near the intersection of the Soda Lake Valley Groundwater Basin, the Silver Lake Valley Groundwater Basin, and the Cronese Valley Groundwater Basin.

Precipitation

The average annual precipitation in the nearby Soda Lake basin ranges from 3 to 5 inches (California Department of Water Resources [DWR] 2003), but is higher in the surrounding mountains. Recharge for the area primarily occurs as runoff from the surrounding mountains onto alluvial fan deposits of the surrounding valleys. Nearby Soda Lake is periodically supplied with water during rare winter storm events, when the Mojave River flows past Barstow, through the Mojave Valley, and through Afton Canyon to Soda Lake (Lines 1996).

Groundwater

Groundwater typically occurs in unconfined alluvial aquifers ranging from tens to hundreds of feet thick in the South Lahontan Hydrologic Region (DWR 2003). In the Soda Lake, Silver Lake, and Cronese Valley groundwater basins, Quaternary alluvium is the major water-bearing unit and is present at thicknesses ranging from 180 to 430 feet or more (DWR 2003). A 1955 USGS report describes the sediments of the Project area as unconsolidated, poorly bedded gravel, sand, and silt underlying relatively steep alluvial fans bordering the fronts of the adjacent mountains. The sediments are estimated to be "moderately to poorly water-yielding" with relatively deep water levels (USGS 1955).

Municipal and irrigation well yields in the Soda Lake Valley Basin are the highest among the three basins, averaging 1,100 gpm, with a maximum of 2,100 gpm, whereas yields in the Cronese Valley Basin average 340 gpm, with a maximum of 600 gpm (DWR 2003). No well yield estimates were available from DWR for the Silver Lake Valley Basin. Depth to water data range from 7 to 25 feet below ground surface (bgs) for wells in Soda Lake Valley Basin, from 18 to 52 feet bgs in Cronese Valley Basin, and from 4 to 77 feet bgs in Silver Lake Valley Basin. A greater depth to the water

table is expected in the Project area, because it is in an upland area that is farther from local discharge zones such as the area dry lakes (Freeze and Cherry 1979). Sediments will likely be coarser and, therefore, more permeable at higher elevations, closer to the mountain front, than at lower elevations.

A 760-foot-deep water supply well (for which there is no available well completion report) located at the Rasor Road service station (Figure 1-3.11) located near the southern end of the Project area was reportedly completed in bedrock and yields only 1,500 gpd. The next closest water supply well outside the Project area is approximately 4 miles southeast of the Project's southern boundary, East Cronese Valley Wells, where the water table is close to the surface, and the well reportedly yields an ample supply of water. This location is lower in elevation than the Project area, and appears to be in the ephemeral stream bed of the Mojave River Wash.

Sediments in the center of the Project area are significantly thicker than at the Rasor Road area, based on topography and distance to the nearest bedrock outcrops. A greater thickness of sediments increases the likelihood of encountering an aquifer that will yield the necessary water supply for the Project. Geophysical studies and test borings were conducted to refine estimates of the sediment thickness and depth to groundwater and bedrock (DYA 2010; RMT 2011b). Figure 1.3-11 shows the locations of geophysical studies and the model domain for groundwater modeling (RMT 2011b). Table 1.3-6 presents data from the borings.

One or more wells will be constructed at the Project site for non-potable water supply for construction and operations. Possible well sites are shown in Figure 1.3-11. These possible well locations were evaluated using data from boreholes (Terra Physics 2010 in Wilson Geosciences, Inc. 2011), geophysical studies to evaluate depth to water and depth to bedrock, and groundwater modeling to identify potential well locations (RMT 2011b). The well depth will depend on the depth to groundwater, type of alluvial sediments or bedrock encountered during drilling, hydraulic aquifer characteristics (yield and storage capacity), and the maximum required flow rate.

Water level and hydrogeologic data from the surrounding area indicate that the Project area will have favorable conditions that will allow for sufficient water supplies to be obtained as long as the sediment thickness is at least 300 feet. It is possible that a thinner layer of sediments could be sufficient if the water table is shallow and the sediments are sufficiently permeable. Moreover, the relatively low flow rate required of the proposed water supply well(s) suggests that a moderately low-yielding aquifer may be sufficient to meet the Project's water supply needs. The well yields for most regional wells provided by USGS information sources (USGS 1955, 1957, 1983, 1991, and 2009) suggest that a new well will likely yield 50 to 100 gpm as long as there is sufficient sediment thickness of 300 feet or more. Final well depth, as well as perforated interval depths, will be selected based on actual sediment thickness encountered, grain size analyses (i.e., sieve analyses), geophysical logs, consultation with the driller, and subsurface stratigraphy.

A substantial hydrogeologic program was conducted to evaluate the existing water supply and potential effects of groundwater extraction for the Project. Three transient electromagnetic (TEM) electrical resistivity sounding stations (Figure 1.3-11) located at the north and south ends of the Project area yielded important data on water table elevation and depth to bedrock (Terra Physics

Figure 1.3-11: Water Resources Site Map

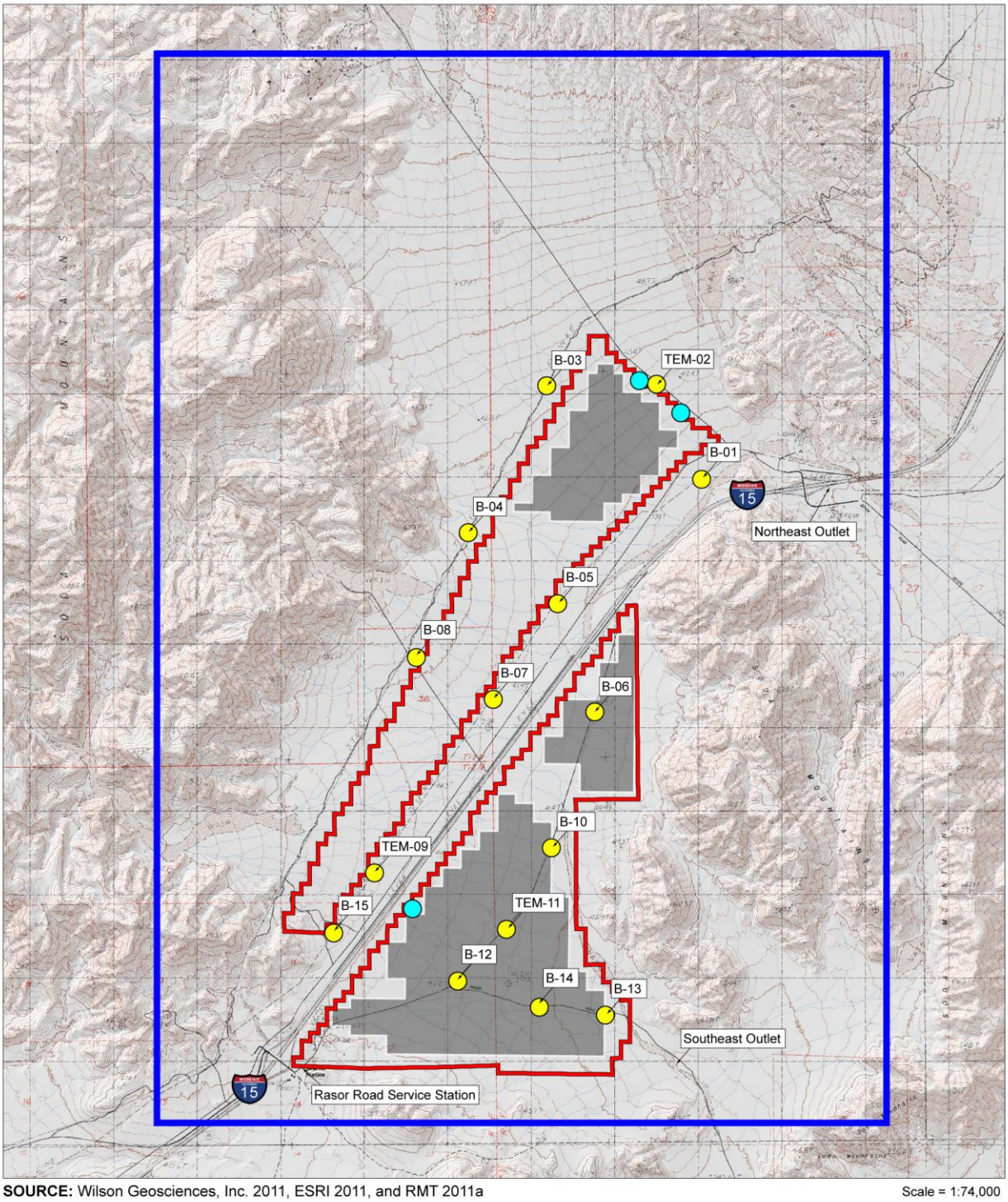


Table 1.3-6: Hydrogeologic Conditions from TEM Survey Results

Sounding*	Depth Range (feet bgs)	Elevation Range (feet AMSL)	Electrical Resistivity (ohm-meters)	Stratigraphy Inferred from TEM Results
TEM-02	0±00 to 67±14	1,414±00 to 1,347±14	330±40	Dry coarse-grained alluvium
	67±14 to 182±13	1,347±14 to 1,232±13	37±10	Dry to very moist, fine-grained alluvium
	182±13 to 332±26	1,232±13 to 1,082±26	4±0.8	Saturated alluvium
	BELOW 332±26	BELOW 1,082±26	530±100	Bedrock
TEM-09 (West side of I-15, east edge of ROW)	0±00 to 143±36	1,524±00 to 1,381±36	360±50	Dry coarse-grained alluvium
	143±36 to 354±30	1,381±36 to 1,170±30	98±20	Dry coarse-grained and fine-grained alluvium
	BELOW 354±30	BELOW 1,170±30	15±03	Saturated alluvium
	---	---	---	Estimated bedrock is at least 500 ft deep
TEM-11 (Center of South Array)	0±00 to 436±49	1,358±00 to 922±49	80±12	Dry coarse-grained and fine-grained alluvium
	BELOW 436±49	BELOW 922±49	610±92	Bedrock
	---	---	---	Groundwater was not detected. If it is present then the estimated maximum undetectable thickness is about 50 feet; therefore, groundwater would be below an elevation of 972 feet.

NOTE:

* Locations shown in Figure 1.3-11.

SOURCE: Terra Physics 2010 in Wilson Geosciences, 2011.

2010 in Wilson Geosciences, Inc. 2011). Soil boring data and in-field infiltration tests yielded data on the permeability of the soil. A three-dimensional Modflow model of the Project area was used to simulate existing aquifer conditions and to evaluate the potential effect of groundwater extraction. The Hydrogeologic Conditions and Groundwater Modeling Report (RMT 2011b) describes the hydrogeology of the Project area and presents the results of groundwater modeling.

The modeling was used to evaluate the feasibility and potential effects of extracting water from the Project site for dust control and panel washing. The TEM results indicate that a location near the

northern end of the Project area, near TEM-02, would be favorable for one or two water supply wells because the depth to water is relatively lower than other sites tested, and the saturated thickness is greater. The model results indicate that sufficient groundwater supplies are available, and that the proposed water extraction would not adversely affect any other water supplies, including groundwater flowing to the Rasor Road service station well, Zzyzx Spring, or wells in the town of Baker.

Using high-end and low-end estimates of hydraulic conductivity and groundwater recharge, the model results indicate that one or two wells would likely yield sufficient quantities of groundwater to meet the needs for construction and operations of the Project. A maximum water table drawdown was estimated to be 20 or 80 feet for the high-end and low-end set of aquifer parameters, respectively, for a well placed at the northern end of the Project area, near the site of TEM-02. TEM results indicate the saturated thickness of alluvium at the TEM-02 location is approximately 140 feet, significantly more than the drawdown estimates. This indicates that the water supply needs would likely be achievable with one or two wells, accounting for well inefficiencies and variabilities in permeability.

Modeling results indicate that the cone of depression associated with groundwater extraction would be limited to an area less than 3,000 feet in radius around the water supply well(s). Areas beyond 3,000 feet from the location of the water supply well(s) would be expected to have less than 1 foot of drawdown. The town of Baker is 33,000 feet northeast of TEM-02, far from any drawdown effects. Zzyzx Spring is approximately 29,000 feet southeast of TEM-02 and across a major drainage divide. The well at the Rasor Road service station is more than 30,000 feet southwest of TEM-02 and is screened in bedrock, also hydraulically isolated from the impacts of groundwater extraction in the vicinity of TEM-02. No groundwater users or springs are known to be anywhere near 3,000 feet of the location of TEM-02. In summary, no impacts from groundwater extraction associated with the Project are expected at the town of Baker, at Zzyzx Spring, at the Rasor Road service station, or for any other groundwater users in the area (RMT 2011b).

Water Rights

The State Water Resources Control Board (SWRCB) records groundwater extractions that exceed 25 acre-feet per year (ac-ft/yr). There would an estimated extraction of 61.6 ac-ft/yr (equivalent to 55,000 gpd; Table 1.3-3) for 2 to 3 years, during construction, and an annual report and fee would be required. After construction, water use would be mainly for periodic solar panel washing, and would be less than 7 ac-ft/yr.

CSM understands that the BLM has no water rights at the Project site. CSM has reviewed the appropriate procedures for obtaining water rights. Groundwater at the Project site is the property of the State of California. In California, water rights are use rights and allow the use of the water but do not bestow ownership.

An industrial well permit from the San Bernardino County Department of Public Health will be required for well installation. Groundwater withdrawals will be evaluated during the environmental review and permitting stage and reviewed for consistency with San Bernardino

County groundwater ordinance No. 3872. Mitigation measures will be discussed with the County if inconsistencies are found.

Production requirements for a new well (volume and flow rate) will also dictate pump size and well casing diameter. WDC Exploration & Wells, a state-licensed water well drilling contractor, has estimated that a 6-inch-diameter polyvinyl chloride well would be sufficient to provide the water needs for the Project. A pump will be selected to efficiently deliver the desired pumping rate. The well would be fitted with a 10-horsepower submersible pump, capable of supplying 95 gpm at 300 feet of head.

Projected Water Quality

Total dissolved solids (TDS) values for Project well water are anticipated to be in the range of 800 to 1,200 parts per million, based on the pattern of TDS values in the surrounding area. The quality of the water should be sufficient to meet the needs for construction and operations, assuming non-potable uses. Washing of the PV panels will involve using an implement (e.g., "squeegee") to remove essentially all of the water from the panels. Solar panel cleaning technicians that contract with Suntech America have indicated that typical water quality does not present an issue for leaving a residue on the panels; therefore, deionized water is not needed for panel washing. The TDS values anticipated are not expected to cause a problem with residue. As stated above, if deionized water is required, portable treatment equipment will be brought on site for that purpose.

Potable water for on-site staff will likely need to be provided from another source, such as a tanker truck, because of the expected high boron and fluoride content in groundwater pumped from the proposed water supply well(s) (DWR 2003).

1.3.7 EROSION CONTROL AND STORMWATER DRAINAGE

The Project area consists of two watersheds (Figure 1.3-12): Basin A and Basin B. Each basin is within the Soda Lake Watershed. Basin A has an outflow that exits northwesterly along the north side of I-15. Basin A outfalls into Soda Lake after crossing Interstate 8, just east of the Zzyzx exit off of I-15. Basin B has an outflow that exits the site to the south. Basin B outfalls into the broad Mojave River Wash, the terminus of the Mojave River, which eventually outfalls into Soda Lake.

Upgradient stormwater runoff will be routed around Project infrastructure using earthen channels and diversion structures to protect site infrastructure. Solar arrays will not be placed in major washes located within the Project site. See Figure 1.1-3 and the 30-percent design drawings in Appendix B for locations of drainage features. The development will not detain runoff or substantially interfere with existing drainage patterns on or off the Project site in order to preserve existing sediment transport through the Project site.

CSM conducted additional studies and modeling to determine if stormwater controls would be required and to respond to BLM questions and comments on the 2009 POD (CSM 2009). The Preliminary Hydrology Study Report (RMT 2011a) was prepared in accordance with the San Bernardino County Hydrology Manual. This report replaces the 2009 Hydrology Study Report (RMT 2009).

The proposed hydraulic structures (e.g., earthen channels) were preliminarily designed (in the Preliminary Hydrology Study Report) so the site could be modeled. At-grade crossings will be constructed to cross existing washes to maintain existing flow channels and sediment transport. By maintaining the existing grades and not significantly increasing the impervious surfaces at the site, the Project will not significantly increase stormwater runoff. On-site stormwater detention would only be provided if determined necessary during final design. Preliminary site modeling indicates no detention or retention will be required because the modeled post-development stormwater generated at the site did not increase over the pre-development (existing case) runoff.

To evaluate if the I-15 levees could overtop in a 100-year storm, the expected flood depths following development were calculated using computer simulations. HEC-RAS, the U.S. Army Corps of Engineers (ACOE) hydraulic flood modeling software, was used for the simulations, and the results were presented in the Preliminary Hydrology Study Report (RMT 2011a). According to the simulations, the proposed development will result in little change from existing conditions for a 100-year storm, and the existing I-15 levees should not overtop.

A Geologic Characterization Report (Wilson Geosciences, Inc. 2011) was prepared for the Project to delineate geologic units present at the Project site and to evaluate potential geologic hazards that could affect the proposed Project. The Project site is located on alluvial deposits that vary from recent to very old with the older deposits forming the more elevated surfaces. Alluvium is generally a mixture of gravel, sand, and silt deposited by water. The heavier gravel tends to deposit on steeper slopes (near local mountains), whereas silt and sand tends to deposit on flatter terrain, which is more prevalent in the lower valley areas. The majority of the Project area consists of very old deposits. Active washes cut through these older deposits and are characteristic of recent deposition. These recent deposits are also areas of high erosion and flood potential, are unstable, and are not suitable for site infrastructure. The Project infrastructure was intentionally located outside of these unstable areas, based on preliminary observation of topography and the presence of desert varnish (an indicator of very old deposits). The Geologic Characterization Report is consistent with preliminary observations and indicates that the alluvial deposits within the proposed site infrastructure areas are suitable for construction of the proposed Project facilities. The Geologic Characterization Report confirms the preliminary observations and indicates that the alluvial deposits under the proposed site infrastructure are stable and suitable for the proposed Project.

A Geologic Field Reconnaissance Report (RMT 2011c) was prepared for the Project, listed in Appendix C, to address scour and infiltration potential in the Project area and at locations of existing culverts along I-15. Field reconnaissance included observations with respect to lithology, including sediment coloration, clast size and roundness, and presence of cemented soils. Also recorded were visual observations with respect to stratigraphy and morphology of the sedimentary deposits, including bedding characteristics, approximate channel cut depth, and steepness of channel cut slopes. In addition, RMT staff recorded the presence of desert varnish, desert pavement, and vegetation. Excessive scour at I-15 culverts was not identified. Figure 1.3-13 provides an overview of flood and erosion potential, based on the Geologic Characterization Report (Wilson Geosciences, Inc. 2011).

Figure 1.3-12: Regional Watersheds

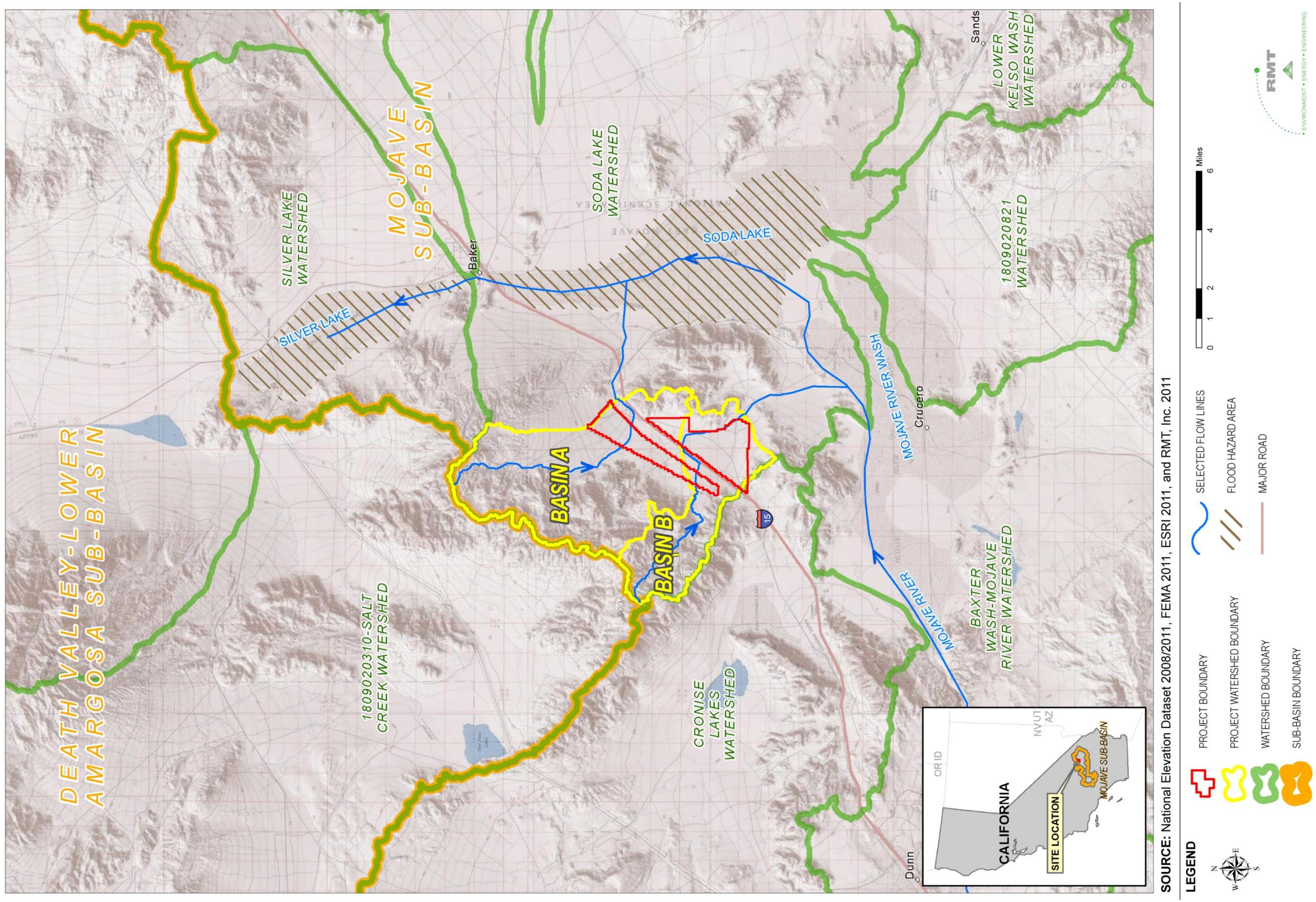
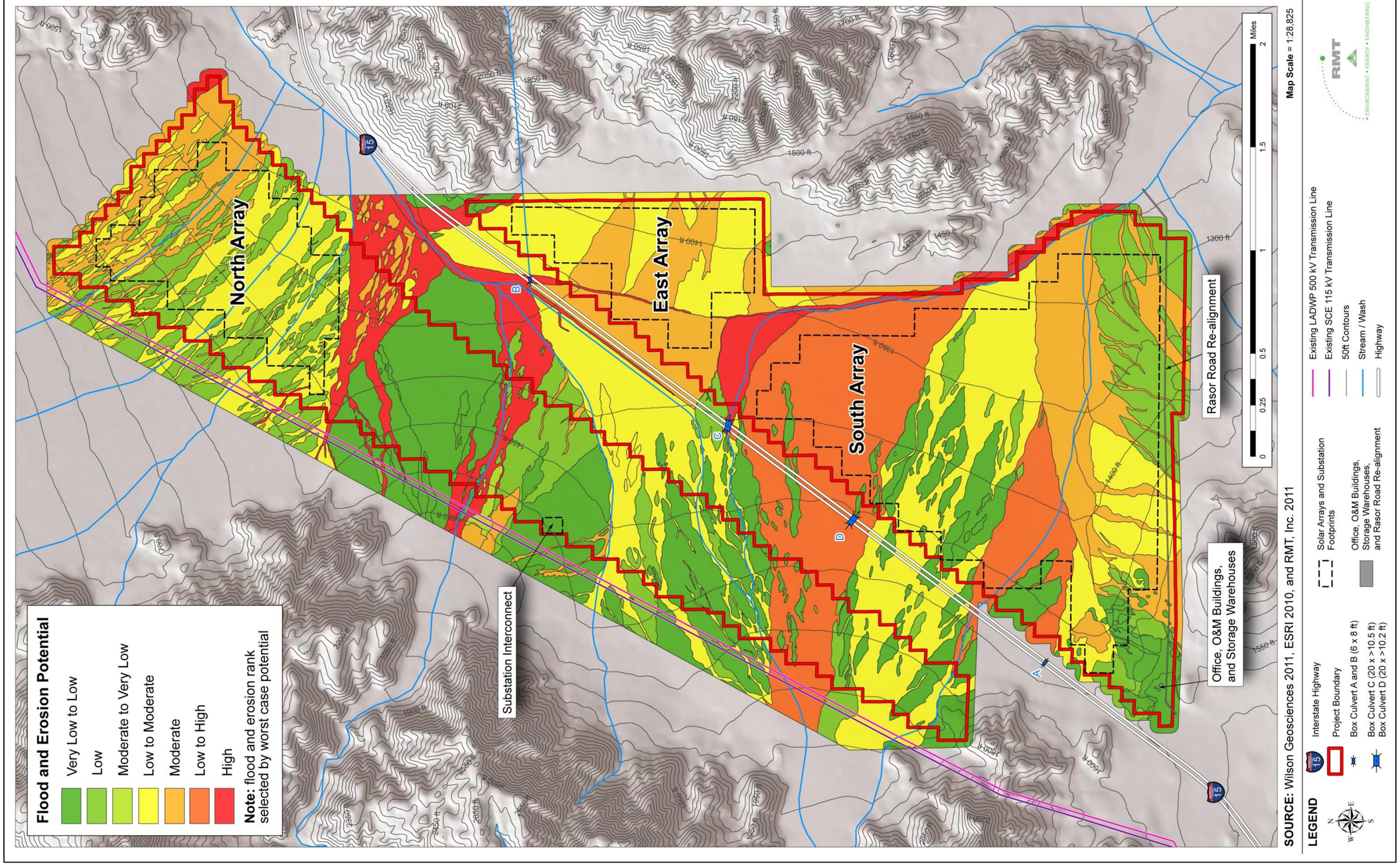


Figure 1.3-13: Flood and Erosion Potential Project Area



A preliminary Water Quality Management Plan (Appendix D) has been prepared in accordance with San Bernardino County stormwater regulations. A Stormwater Pollution Prevention Plan (SWPPP) will be submitted to the Lahontan Regional Water Quality Control Board (LRWQCB) after final design to obtain a National Pollutant Discharge Elimination System (NPDES) permit during the construction phase. The NPDES permit program regulates point sources that discharge pollutants into water of the United States. The SWPPP would define how the Project will practice best management practices (BMPs) to lessen the risk for potential pollutant discharges into surface water. A Project-specific SWPPP will be prepared and submitted to the LRWQCB following final design.

1.3.8 VEGETATION TREATMENT AND WEED MANAGEMENT

Existing vegetation at the site consists primarily of desert scrub. A Special Status Plant Survey Report (Appendix C), prepared by URS, provides a table indicating each type of plant observed in the Project area during the survey.

Field surveys of the Project site conducted by URS found four non-native plant species, identified in one of the following databases: California Invasive Plant Inventory Database for the Mojave Desert from California Invasive Plant Council, the Mojave Weed Management Area Problem Weed list, and the California State Listed Noxious Weeds List (sorted for the Mojave Desert). These plants include the *Bromus madritensis* (foxtail chess), *Hordeum murinum* (glaucous foxtail barley), *Schismus barbatus* (Mediterranean schismus), and *Vulpia myuros* (fescue). URS documented one *Castela emoryi* (Emory's crucifixion thorn), which is a rare plant species. URS also observed *Acacia greggii* (cat claw acacia), several species of the *Cactaceae* (cactus) family, and *Atriplex hymenelytra* (desert holly), which are all protected under the California Desert Native Plant Act (CDNPA).

BLM has indicated that construction of the Project may require that existing desert scrub vegetation be cut back from the occupied portions of the Project area. These areas may be cleared and grubbed of vegetation and maintained as bare ground. CSM has previously explored cutting back vegetation during the construction period and allowing it to re-grow between the panels; however, vegetation would have to be periodically re-cut during the life of the Project. The approach to Project construction is to alter site grades as little as possible to accommodate the placement of site infrastructure. Grading will be limited to constructing a grid of access roads constructed of compacted native soils. At select locations of the site, cut-and-fill will be required. These areas will be compacted to form a hard, stabilized crust.

During the Project construction phase, large areas of land within the site boundaries will be disturbed. Such disturbance creates potential habitats for non-native or invasive species to infiltrate the area. CSM is aware of BLM's and San Bernardino County's desire to preserve the habitat of native species and to prevent the infiltration of non-native plant communities. CSM is currently preparing a Weed Management Plan (WMP), which will be submitted to the BLM for approval. The WMP will also be submitted to the BLM Barstow Field Office prior to any herbicide application. The BLM Barstow Field Office will approve all pesticides to be used on site prior to application. Additionally, CSM will maintain existing vegetation or re-vegetate areas to the extent possible throughout the Project area.

If it is determined that herbicides would be used on site to manage vegetation, any herbicides used would be verified to be on the active ingredient list under the Preferred Alternative of the Final Vegetation Treatments Using Herbicides Programmatic Environmental Impact Statement (EIS) prepared for the BLM in September 2007.

1.3.9 WASTE AND HAZARDOUS MATERIALS

Hazardous materials that may be used during construction and/or O&M of the facility could include paints, thinners, solvents, sealants, and lubricants. The quantities and concentrations of these hazardous substances are not expected to reach regulated levels. Facility transformers will contain non-polychlorinated biphenyl- (PCB-) rated dielectric fluid.

Small amounts of hazardous materials may be stored in secure locations duration construction and operations of the Project. These may include fuel, cleaning solvents, lubricants, and drilling mud (for drilling cable conduits under I-15 and possibly for water well drilling). All potential contaminants will be stored and used at least 50 feet from any defined or constructed channels or basins at all times. If required, a Spill Prevention Control and Countermeasures Plan (SPCCP) will be developed and may be amended as a result of the Environmental Impact Statement (EIS) and, if required, Environmental Impact Report (EIR) analysis. Most of the fuel required by construction and operations vehicles and engines will be procured at commercial gas stations in the local area, possibly at Rasor Road or in Baker. If necessary, petroleum fuels may be stored in the staging areas to fuel Project vehicles. These fuels would be stored in areas with secondary containment to contain any potential spilled material. All waste generated during construction would be stored in wind-proof and wildlife-proof containers that would be periodically transported to an off-site disposal facility authorized to accept the waste. Generic material safety data sheets (MSDSs) for the hazardous materials that are expected to be used on site are included in Appendix E. MSDSs for all hazardous materials stored on site will be retained on site during Project construction and operations.

The SPCCP would be developed prior to Project construction in accordance with U.S. Code of Federal Regulations (CFR), Title 40, Part 112 (40CFR112), 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.

1.3.10 FIRE PROTECTION

There is negligible potential for wildfire in the Project area. Vegetation is sparse with little potential for vegetative fuel buildup. Similarly, the PV panels and ancillary equipment represents a negligible increase in fire potential.

1.3.11 SITE SECURITY AND FENCING

Construction

CSM will post safety and warning signs at the gate located at the Rasor Road access road informing the public of construction activities and directing the public stay off the site. Temporary warning fences will be erected in areas where public safety risks could exist and where site

personnel will not be available to control public access (e.g., excavated foundation holes and electrical collection system trenches). Similarly, fencing will be installed around laydown areas. Other areas deemed hazardous, or where issues with security or theft are of concern, may also be fenced. CSM will coordinate fencing with the BLM.

Operations

Subject to approval from relevant regulatory bodies and legal and liability review, CSM proposes that the ROW be primarily secured using warning signage, perimeter fencing, and perimeter security cameras. Where security fences cross drainage ditches, a Caltrans barbed wire ditch crossing is proposed. This detail was added to the 30-percent design drawings (Appendix B).

The Project switchyard and substation will be permanently fenced for safety. Fencing around the substation will be a gated 7-foot-high chain-link fence with the required three strands of barbed wire. Fence details are shown in the 30-Percent Design Drawings Addendum in Appendix B (Sheet C-503). Security cameras will also be installed to assist site security personnel in monitoring the Project boundaries. Security camera technology is expected to improve during the construction of the Project; therefore, advanced technology at the date of operations would be installed. Additionally, upgrades to the technology may be made during the life of the Project.

1.3.12 ELECTRICAL COMPONENTS

New Equipment and Existing System Upgrades

Based on the Feasibility Study (Appendix F) and System Impact Study (Appendix G) performed with respect to the interconnection of the Project to the LADWP Market Place-Adelanto (M-A) transmission line, it is not anticipated that a transmission system upgrade (other than construction of the interconnecting switchyard) will be required for interconnection to the electrical grid; however, CSM will follow applicable regulations and requirements for interconnection.

1.3.13 INTERCONNECTION TO ELECTRICAL GRID

It is anticipated that the Project will connect to an existing LADWP transmission line. A discussion of the existing lines and interconnection agreement status is presented in Section 3.1.

1.3.14 SPILL PREVENTION AND CONTAINMENT

Construction

Construction equipment and O&M trucks will be maintained at all times to minimize leaks of motor oils, hydraulic fluids, and fuels.

Small amounts of oils and greases, special wastes, and fuel will be stored as required in accordance with applicable standards and regulations. Hazardous materials will be stored within secondary containment to control any potential leaks of oils, greases, fuels, and other hazardous materials stored at the Project site. Diversionary structures, meeting the requirements of the SPCCP Regulations, will be provided for oil-containing equipment, including transformers, at the Project site. Inspection of transformers will be performed on a regular basis to detect and respond to any leakage. All use, storage, transport, and disposal of hazardous materials associated with the

Project will be done in strict accordance with federal, state, and San Bernardino County regulations and guidelines. Employees will be trained in the proper protocol for notification and cleanup of hazardous materials. Additionally, the site will be supplied with adequate spill containment kits and personal protective equipment in case of a release. No extremely hazardous materials are currently anticipated to be produced, used, stored, or disposed of as a result of the Project.

1.3.15 HEALTH AND SAFETY PROGRAM

Safety is of primary concern to CSM. The Project will follow all federal Occupational Safety and Health Administration (OSHA) and state (Cal/OSHA) requirements for construction and operation. Prior to any construction activity on site, CSM or CSM's contractor will prepare a Health and Safety Plan, which will comply with OSHA and Cal/OSHA guidelines for the types of activities being performed. All personnel on site during construction and operations will be trained and given access to all appropriate OSHA and Cal/OSHA guidelines. A safety and compliance coordinator will be assigned to the Project to ensure that safety is given high priority.

On-site employees will be provided health and safety training to address the potential issues associated with the Project. Additionally, employees will be trained on proper notification and containment following a release. Employees tasked with monitoring releases will be trained and provided with personal protective equipment to ensure their safety.

To ensure the safety of the public, the ROW will be fenced and signs will be posted. Access to the site will be limited.

1.4 Federal, State, and Local Agency Permit Requirements

The proposed Project will be reviewed by the BLM, California Desert District Office. Depending on the resources identified on the site, the BLM may ask other federal, state, regional, or county agencies to review proposed plans. Table 1.4-1 identifies potential permits and approvals that may be required for the Project.

1.4.1 REQUIRED PERMITS

Federal

Bureau of Land Management (BLM)

The BLM processes the application for a grant of ROW and if the Project is approved, processes an amendment to its Resource Management Plan to accommodate the Project. The BLM is the lead federal agency for environmental review under the National Environmental Policy Act (NEPA). The BLM also issues other approvals relating to site field work and development.

Federal Energy Regulatory Commission (FERC)

FERC regulates interconnection of new generators to the interstate transmission grid. In California, FERC regulations are implemented by the California Independent System Operator (CAISO), which will perform an interconnection study for the Project if the M-A line is not used. Such a study is not needed if the M-A line is used.

Table 1.4-1: Permits and Approvals Needed for the Soda Mountain Solar Project

Agency	Permit/Approval Required
FEDERAL	
Bureau of Land Management	Application for Transportation and Utility Systems and Facilities on Federal Lands (SF-299) (ROW Grant), NEPA implementation (EIS), Resource Management Plan Amendment, Paleontological Resource Use Permit, Fieldwork Authorization Permit
Federal Energy Regulatory Commission	Obtain approval for interconnection (from CAISO)*
U.S. Fish and Wildlife Service	Endangered Species Act, Section 7 consultation**
Department of Defense	Radar/flight interference consultation
STATE	
California Department of Fish and Game	Section 1600, Streambed Alteration Permit; State Endangered Species consultation**
California Department of Transportation	Encroachment Permit for crossing I-15
California Public Utilities Commission	Notice of Intent must be filed under General Order 52 (GO-52), CPUC would have jurisdiction for an upgrade of the SCE line
State Historic Preservation Office	Section 106 consultation
State Water Resources Control Board	Records groundwater withdrawal
Lahontan Regional Water Quality Control Board	Construction Stormwater General Permit; approval of construction SWPPP and SPCCP; Industrial Stormwater General Permit; approval of O&M SWPPP and SPCCP; approval of groundwater withdrawals; Treatment Permits; 401 Certification under Section 401 of the Clean Water Act (CWA); NPDES permit under Section 402 of the CWA
REGIONAL	
Mojave Desert Air Quality Management District	Fugitive dust and vehicle emission regulations
COUNTY	
San Bernardino County	Regulates changes to land use on private land; consultation, if needed, to the BLM regarding drainage plans**; groundwater extraction permit under Ground Water Ordinance No. 3872

Table 1.4-1 *(Continued)*: Permits and Approvals Needed for the Soda Mountain Solar Project	
Agency	**Permit/Approval Required**
LOCAL	
Los Angeles Department of Water and Power	Transmission line interconnection agreement
Notes: * Approval not needed for interconnect with M-A line. ** Indicates permits or requirements that are potentially needed. Status is to be determined after agencies are consulted and preliminary design and initial environmental studies are completed.	

U.S. Fish and Wildlife Service (USFWS)

The USFWS will review studies related to federally listed species at the site as required under Section 7 of the Endangered Species Act. The agency issues a "No Jeopardy" opinion if no such species are identified or if impacts from the Project would not jeopardize viability of these species.

Department of Defense (DoD)

The DoD reviewed Project development documents and determined that the Project will not interfere with military testing or training (Parisi 2011).

Non-federal

California Department of Fish and Game (CDFG)

The CDFG reviews studies relating to state-listed species at the site as required under the California Endangered Species Act. The agency is responsible for issuing permits for the modification, if any, of streambeds in the area.

California Department of Transportation (Caltrans)

Caltrans requires an encroachment permit for electrical power crossings of state roadways.

California Public Utilities Commission (CPUC)

The CPUC regulates privately owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies. The CPUC's General Order 52 regulates construction and operation of power and communication lines for the prevention or mitigation of inductive interference. The CPUC would regulate upgrading the SCE transmission line.

State Historic Preservation Office (SHPO)

SHPO staff review archaeological, historical, and paleontological studies of the Project site. SHPO is consulted under Section 106 of the federal Historic Preservation Act to determine the importance of resources in the area and to identify measures that would mitigate impacts to these resources.

State Water Resources Control Board (SWRCB)

The SWRCB records groundwater withdrawal.

Lahontan Regional Water Quality Control Board (LRWQCB)

The LRWQCB issues a Construction Stormwater General Permit; approves the construction SWPPP and SPCCP; issues Industrial Stormwater General Permits; approves the O&M SWPPP and SPCCP, and regulates the Groundwater Recordation Program (Water Code, section 4999, et. seq.), which applies to wells in San Bernardino County with aggregate extractions of more than 25 ac-ft/yr of groundwater. In addition, a Section 401 Water Quality Certification may be required from the agency if water is discharged from the Project to certain water bodies. An NPDES permit may also be required under Section 402 of the CWA.

San Bernardino County

The County regulates land use matters on private land. Portions of the transmission line ROW and other road ROWs may occupy private land adjacent to the BLM ROW in order to access the BLM land. The BLM may consult the County regarding drainage and other design aspects of the Project. A groundwater extraction permit may also be required under Ground Water Ordinance No. 3872.

CSM consulted with San Bernardino County regarding relocation of Rasor Road. The County responded that the road is not a County road and the County would not have jurisdiction over realignment of the road.

Mojave Desert Air Quality Management District (MDAQMD)

Fugitive dust and vehicle emissions will be controlled in accordance with a plan as required by the MDAQMD.

Los Angeles Department of Water and Power (LADWP)

LADWP owns the transmission line that crosses the site and will negotiate an agreement regarding the switching station and interconnection of the Project to this line.

1.4.2 STATUS OF PERMITS

Permits are in the process of being defined. All applicable permits will be obtained by CSM before construction of the Project.

1.5 Financial and Technical Capability of Applicant

CSM is an affiliate of Caithness Development, LLC (Caithness). Caithness is a privately owned company based in New York specializing in power plant development, operation, and management. Caithness's primary focus for over 25 years has been the development, financing, ownership, and operation of power generation projects that use geothermal, wind, solar and natural gas. Caithness and its affiliates have successfully developed, operated, and owned interests in 35 operating power projects, including over 2,500 MW of wind projects, over 350 MW of geothermal projects, 160 MW of solar projects, 28 MW of hydroelectric projects, and over 2,000 MW of natural gas projects. The total budget of the Project is expected to be about $2 billion.

Caithness, through its affiliates, has closed numerous financings over the past ten years totaling in excess of $6 billion. The following is a list of the most recent transactions:

- Caithness Long Island, LLC – $450 million (MM) of senior secured notes in June 2007. The Caithness Long Island Project consists of an approximately 346-MW, dual-fuel, combined-cycle power plant located in Brookhaven, New York. The project has a 20-year power purchase agreement with the Long Island Power Authority. The project began construction in 2007 and began commercial operations in August 2009.
- Caithness Coso Funding Corp. – $375 MM of senior secured bonds and $90 MM of subordinated secured notes in August 2005. The Coso Project consists of three 80-MW geothermal power plants (Navy I, Navy II, and BLM) located in the Mojave Desert approximately 150 miles northeast of Los Angeles. Electricity is sold to SCE pursuant to three power purchase agreements.
- Caithness Dixie Valley, LLC – $125 MM of senior notes in October 2005. The Dixie Valley project is an approximately 60-MW geothermal project located 130 miles east of Reno, Nevada. Electricity is sold to SCE pursuant to a power purchase agreement.
- Cameron Ridge, LLC, Pacific Crest, LLC, and Ridgetop Energy, LLC (Tehachapi Projects) – $115 MM of senior secured notes in December 2005. The Tehachapi Projects consists of three individual projects totaling approximately 140 MW of wind power. Electricity is sold to SCE pursuant to four power purchase agreements The Ridgetop project recently executed two new power purchase agreements with SCE that will allow the project to repower 17 MW of its existing capacity and add up to an additional 17 MW of new capacity.
- Caithness California Wind Holdings, LLC (CCWH) – $71 MM of a senior secured credit facility in August 2005. CCWH consists of four individual projects totaling approximately 92 MW of wind power. Electricity is sold to SCE pursuant to multiple power purchase agreements. CCWH recently executed two new power purchase agreements with SCE that will allow the project to repower its existing 18 MW of capacity and add up to an additional 16 MW of new capacity.

2: Construction of Facilities

The actions necessary to construct the Project are described below. This section contains a general description of the construction steps for the major components of the Project. This plan discusses the general activities and design approaches as currently understood and anticipated. CSM will remain in contact with the BLM as the Project designs are finalized and construction specifics become available. It is anticipated that construction will occur over the course of approximately 36 months.

Project construction will be performed in several stages and will include the following main elements and activities:

- Improvement of Rasor Road, as required, to the main entrance of the facility and re-routing of the portion of Rasor Road that currently runs through the proposed array fields on the southern perimeter of the array fields
- Grading of the building and substation areas
- General clearing and construction of the temporary laydown areas
- Civil works associated with drainage channels
- Construction of buildings
- Construction of foundations and mounts for the panel arrays, inverters, trackers, and medium-voltage transformers
- Installation of the electrical collection system
- Assembling and erection of the solar panels
- Construction and installation of the substation
- Solar panel commissioning and energizing
- Final grading and drainage
- Restoration activities

All Project construction will follow site-specific soil erosion and sediment control measures described in the SWPPP prepared and implemented in accordance with a General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 99-08-DWQ) for the Project.

2.1 Solar Field Design, Layout, Installation, and Construction Processes

2.1.1 TIMELINE

CSM anticipates constructing the Soda Mountain Project solar array field at a rate of approximately 3 MW per week, over approximately 3 years, for a total of 350 MW AC peak power to the grid. The construction schedule is shown in Figure 1.1-8.

2.1.2 SEQUENCE OF CONSTRUCTION

Construction will begin with clearing the staging areas and the substation location. The staging areas will include air-conditioned construction offices, a first aid station and other buildings, worker parking, truck loading and unloading facilities, and an area for staging a small number of array pre-assembled modules and assembling the tracker, inverter, and medium-voltage transformer concrete bases. Temporary storage for staging of a 1-month supply of concrete raw materials would be constructed. CSM would then survey, clear, and grade road corridors to bring equipment, materials, and workers to the areas under construction. The corridors will incorporate buried electrical lines for the low-voltage circuits. The medium-voltage lines will serve as collection lines that bring power from transformers in the PV blocks to the substation.

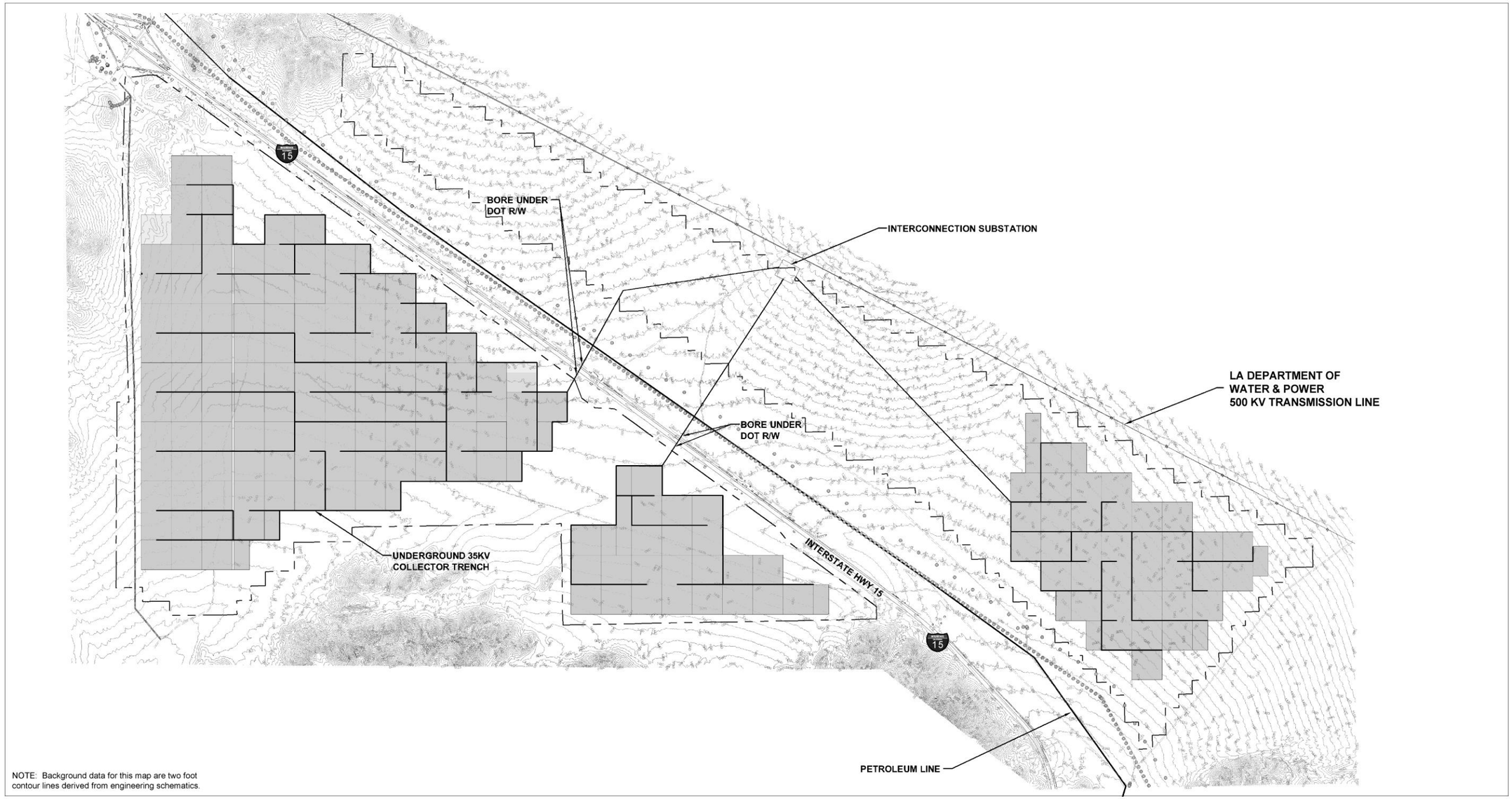
Construction of the solar arrays is expected to take place at a pace of approximately 3 MW per week. The active construction area will occupy between 90 and 180 acres at any given time. Prior to construction of the solar arrays, the area of 90 to 180 acres will be surveyed, larger vegetation will be cut or crushed, and the ground will be prepared as necessary to provide a relatively flat surface. Locations for the inverters, transformers, and buried electrical lines will be surveyed. Buried electrical lines for DC array wiring and AC wiring will then be installed using trenching machines. The trenches will be approximately 1 to 2 feet wide and 2 to 4 feet deep with a total length of approximately 120 miles. The proposed location of the trenches is shown in Figure 2.1-1. After this work is complete, and depending on the level of ground preparation chosen, the surveyors, vegetation cutters, graders, and trenchers would move on to the next block. Figure 2.1-2 shows the anticipated sequence of construction at this time (March 2011).

Trucks with large tires, treads, or other low-impact devices will be used to bring workers, equipment, and materials to the area under construction. For example, components will arrive on tractor-trailers at the staging area and will be brought to the installation location directly. Array support structures will be bored (most likely), vibrated, or pile-driven into the ground and secured by ground anchors or concrete footings if needed. An estimated 31,500 solar array structures, each approximately 170 feet long, will require one support pole every 13 feet, resulting in a total of approximately 410,000 poles.

Once the support structures are in place, solar panels will be attached to the support frame. The assembled groups of solar panels will be wired together into strings via connectors on the back of the modules. Assembled panel sections then will be connected to a combiner box located on the inverter pad and will deliver power to the local inverter. Inverters will be mounted on large concrete pads. Inverters and transformers will be brought in by tractor-trailers and delivered directly to the mounting pad sites. The collector system will be constructed using trenching techniques.

At the same time the solar arrays are being constructed, a separate crew will begin building the Project substation, switchyard, and the transmission line to the LADWP transmission line and interconnection. After the initial solar arrays are installed and interconnected to the grid, they will begin generating power while additional PV blocks are constructed. After PV blocks are installed there should be only infrequent low-impact vehicular traffic on pathways between PV blocks for

Figure 2.1-1: Collector Trench Layout



SOURCE: RMT Inc. 2009

LEGEND

W S N E

Proposed Project Area Boundary

PV Panel Array

2 Foot Contour Line

0 2000 4000 Feet

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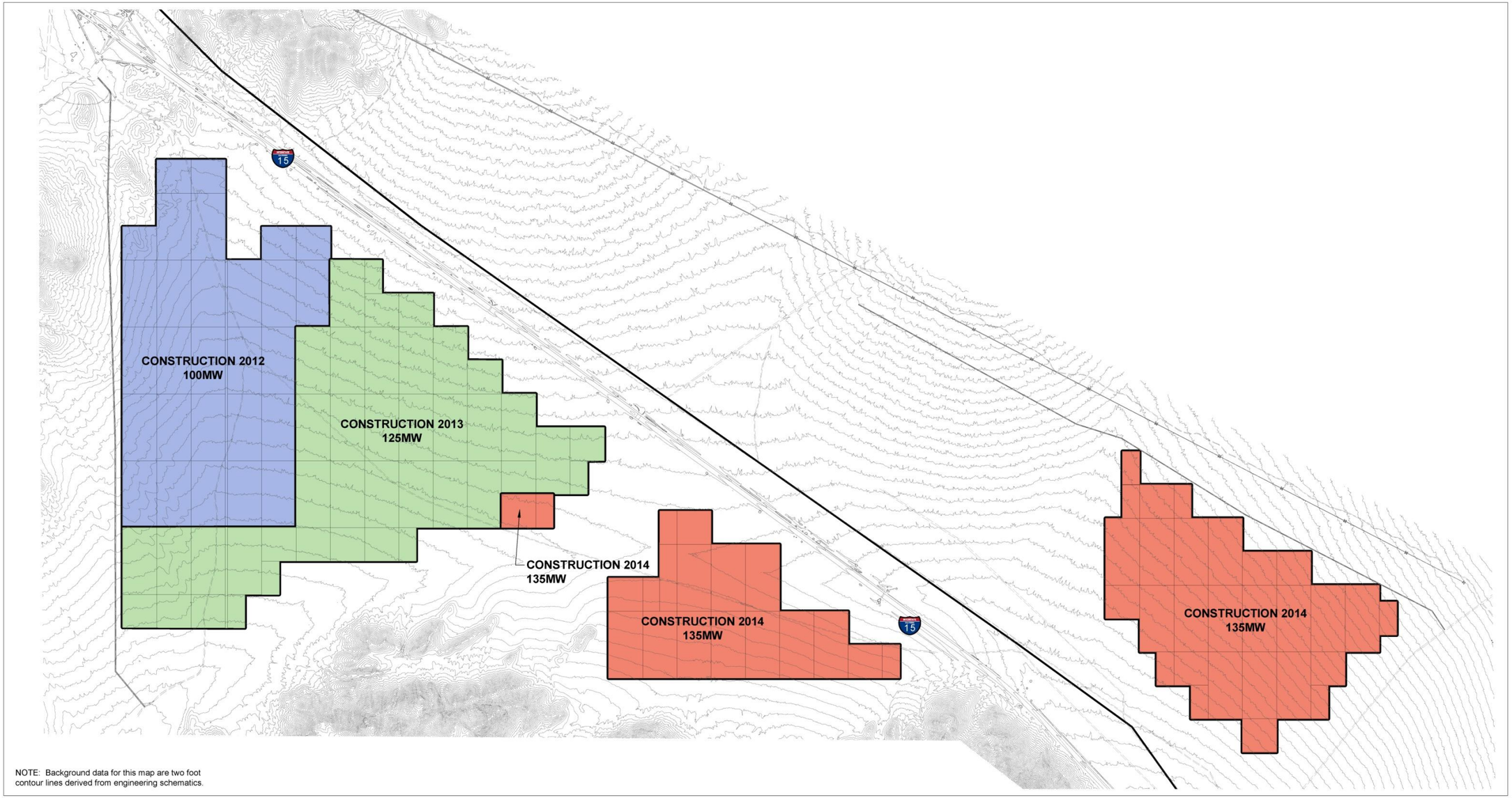
Figure 2.1-2: Construction Phasing



SOURCE: RMT Inc. 2009

LEGEND

W S N E

PV Panel Array 2012 Construction

PV Panel Array 2013 Construction

PV Panel Array 2014 Construction

2 Foot Contour Line

0 2000 4000 Feet

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inspection and repair. It is anticipated that during the construction phase, the solar panels will require additional washing to remove the higher level of dust accumulating on the panels as a consequence of construction activities. The impact on water and vehicular movement has been captured in the balance of this report and included tables.

The high-voltage switchyard and substation will be constructed on the west side of the Project site, northwest of I-15, and will occupy approximately 6 acres. The switchyard will be located near the LADWP transmission line. The substation and switchyard will be graded and compacted to an approximately level grade. A substation and switchyard grounding grid will be installed (as required). One or more cement pads will be constructed as foundations for substation equipment and the remaining area will be graveled. Concrete piers and footing will be installed to support the transmission towers, switchyard, and substation buswork. Electrical transformers, switchgear, and related substation facilities will be designed and constructed to transform the 34.5-kV power on the collection lines to the transmission line voltage. A gated 7-foot-high chain-link fence with three-strand barbed wire meeting National Electric Safety Code requirements will be constructed around the substation and switchyard.

CSM representatives will meet with the BLM to determine if qualified environmental monitors will be required on site during construction activities.

2.2 Phased Projects

The Project is planned to be constructed in an essentially continuous process over a period of approximately three years. This schedule has the following advantageous attributes:

- Facilitates the orderly development of the site
- Provides for long-term, steady employment of construction workers
- Allows for efficient use of production and delivery capacity for capital equipment (e.g., panels), supplies, and material
- Minimizes the peak impact on roadways and neighboring communities
- Matches the growing need on the part of utilities to purchase renewable resources

Construction is expected to start in 2012 or 2013, depending on the schedule for the environmental review and permits. Anticipated construction phasing for the Project includes the following: 100 MW in 2013, 125 MW in 2014, and 125 MW in 2015.

CSM currently has no plans for any further expansion of the Project.

2.3 Access and Transportation System

2.3.1 COMPONENT DELIVERY

Components and construction materials will be delivered as needed at a rate of approximately 2,000 truckloads per month (refer to Section 2.4.2 for additional information regarding vehicular delivery).

2.3.2 WORKER ACCESS

Rasor Road will be used as the primary access route into the south and east arrays and Arrowhead Trail, accessible from Zzyzx Road, will be used as the primary access route into the array fields north and west of I-15, eliminating the need to construct new roads. Access within the Project site will be along existing dirt roads and within specific graded corridors.

2.4 Construction Work Force

2.4.1 NUMBERS

The construction workforce will consist of an average of 150 direct labor workers over a 3-year construction period. The construction work force will peak at up to 250 direct labor workers during the height of construction. Of this direct labor workforce, approximately 30 percent will be skilled labor and 70 percent unskilled labor. In addition to this direct labor workforce, there will be approximately ten additional workers at the site engaged in supervisory, contract services, administration, and other non-direct labor activities.

2.4.2 VEHICLES

Over the approximately 36-month construction period, the Project will require approximately 2,000 truckloads of construction materials per month. This totals about 72,000 truckloads over the total construction period. This does not include general construction vehicles. In the event water is unavailable at the site, water transport trucks would also be required. Average truck traffic will be approximately 100 trucks per day, 20 days per month.

2.4.3 EQUIPMENT

Standard construction equipment will be used during construction, including earth-moving equipment (e.g., bulldozers, excavators, and backhoes) and road-building equipment (e.g., compactors, scrapers, and graders). This equipment will include:

- Air compressors
- All-terrain passenger vehicles
- Backhoes
- Cranes
- Drill rig
- Flat-bed trucks
- Front-end loader
- Pick-up trucks
- Pile driver
- Trencher
- Water trucks

2.4.4 TIMEFRAMES

Construction will use a just-in-time delivery system as supplies and components are delivered.

2.5 Site Preparation

The estimated permanent area of land disturbance is shown in Table 1.3-1. The area estimated to be disturbed by arrays is based on the area within the fenced line of the arrays shown in Figure 1.3-1. The on-the-ground footprint for the support structures is actually much less.

2.5.1 SURVEYING AND STAKING

Road corridors, buried electrical lines, PV block locations, and the locations of other facilities will be flagged and staked to guide construction activities.

2.5.2 VEGETATION REMOVAL AND TREATMENT

Construction of the Project will require that existing desert scrub vegetation be cut back from the occupied portions of the Project area. Areas within the solar array field may be cleared and grubbed of vegetation if necessary and maintained as bare ground. The Project will be constructed with the intent to maintain existing ground surface as much as possible. The site-specific SWPPP will provide a description of the erosion control methods planned for the site.

Vegetation removal is further discussed in Section 1.3.8.

2.6 Site Clearing, Grading, and Excavation

2.6.1 ARRAY BLOCKS

Areas containing the array blocks and other infrastructure will need to have larger vegetation crushed or cut back. Areas for the blocks will be lightly graded to the extent required and the soils stabilized to provide a relatively flat construction surface. The staging area, road corridors, building and substation location, and areas for other infrastructure will need to be cleared and graded.

A relatively flat surface is required for the installation of the trackers. CSM intends to investigate construction and ground preparation options that could reduce the amount of ground disturbance and related environmental impacts. Trenching machines will be used to bury electrical cables between inverters and transformers. The Project will require approximately 120 miles of trenches approximately 1 to 2 feet wide and 2 to 4 feet deep to bury the DC block wiring and low-voltage AC wiring. The ground that the trenching will occur on will already be disturbed by roadways and assembly process to mount the supports and panels. The trenched areas will be filled once the cables are buried.

2.6.2 ROADS

Road construction at the site will consist of improvements to existing roads to remain after construction, including the realignment of Rasor Road, PV system access roads, and site maintenance roads. Roads are shown on Figure 1.3-1.

The existing roads (mainly the southern entrance to the site, Blue Bell Mine Road, and the access road on the west side of the site parallel to the transmission lines) will require some reinforcement with rip-rap or crushed aggregate during construction and maintenance of the Project. This

improvement will be limited to areas damaged by erosion or washed out in rain events or where sharp turns need to be widened to allow equipment deliveries. Most wash crossings will be at grade over wide channels with compacted native materials (Figure 1.3-8).

Rasor Road will be relocated, requiring replacement of the existing road. The realignment will result in approximately 2.6 miles of newly constructed roadway 26 feet wide. The road surface will consist of graded and compacted native material. Aggregate surface material is not proposed.

To access the interior of the site, it will be necessary to create graded roadways in corridors to bring equipment and materials from the staging areas to the construction areas and then to access the PV equipment during operation of the system. These roads will consist of compacted native material and will be graded as necessary, but will generally follow the existing terrain. The access and maintenance roads will be heavily used during construction and routinely used during operations. Approximately 14.5 miles of access roads 16 feet wide and maintenance roads 10 feet wide are planned for the Project.

2.6.3 GRADING PLANS

Grading plans are discussed in the Preliminary Hydrology Study Report and the PV Plant Infrastructure Construction Drawings 30-Percent Submittal. The draft grading plans include proposed contours, grading daylight lines, flow lines, grade breaks, potential drainage features, and spot elevations sufficient to demonstrate that streets, driveways, parking lots, and drainage grades meet minimum requirements. Final design plan sheets will be prepared at appropriate scale and will show layout and location of site grading improvements and drainage facilities. Earthwork quantities (i.e., cut, fill, and net volumes) will be shown on the plans. Design section sheets will be produced at appropriate scale and will contain site cross sections and other pertinent features for proposed grading features corresponding to those depicted on the grading plans.

2.7 Solar Array Assembly and Construction

2.7.1 PROJECT SUBASSEMBLIES

The solar array field will be constructed at a rate of approximately 3 MW per week over approximately 36 months for a total nominal output of 350 MW AC peak power to the grid. Each module will be installed, wired, safety-inspected, and tested. Approximately 360 modules will be constructed to form the entire 350 MW AC Soda Mountain solar field. The rate will be approximately three blocks per week (each block is 1 MW) during construction.

2.7.2 VENDOR PARTNERSHIPS AND QUALITY

An early and critical part of the quality control planning of the Soda Mountain Project is vendor participation during the design and development phase. Vendor experts in component applications and usage will actively participate. Vendor experts will directly participate in the training of installation crews for their products and provide on-site quality feedback.

2.7.3 IN PROCESS INSPECTION

For a project of this magnitude with the individual number of components estimated to be over 60 million, an aggressive quality control/quality assurance program is essential. All assembly methods and procedures will be documented and approved by design engineering and safety engineering prior to thorough employee and worker training and certification. Certified workers will be responsible for assembly and construction "to-print" and "to-procedure" on the job site. Critical installation points will be inspected by quality control inspectors who are responsible only for quality and answer directly to senior project management. Any deviations from plan or procedure will be analyzed by engineering experts and appropriate corrective actions implemented and documented. The quality control efforts will be monitored by an aggressive quality assurance program of systematic audits of processes and procedures.

2.7.4 TYPICAL START-UP PROCEDURES

Safety Visuals

1. System-wide visual verification of mechanical integrity of tracker support structure and ground supports.
2. Visual verification of DC string wiring via color coding and routing methods and secure connectorization.
3. Visual verification of DC bussing in combiner boxes, fuse installations, and switch positions.
4. Visual verifications and measurements of tracking system wiring, mechanical attachments, and safety limits. Freedom from obstructions verified.
5. Visual verifications of DC connections, fusing, and switch positions at inverter inputs.
6. Visual verifications of AC connections, fusing, and switch positions at inverter outputs, testing of sub-blocks in stand-alone fashion (not grid-tied).
7. Module transformer fusing inspection and switch positions, testing of medium-voltage connections after two modules have been fully tested and also after verification when tied to the grid.

Electrical and Thermal Safety and Reliability Start-up Testing (all steps are post-visual inspection)

1. After visual verifications, electrically measure PV strings with a simulated dissipative load bank. Electrical measurements and test procedure will comply with panel manufacturer recommendations.
2. Switch on and test blocks of connected modules without grid interconnection to verify DC collector system wiring.
3. Inspect and test inverters in accordance with the manufacturer-provided start-up and test procedure.
4. Inspect and test tracking system according to manufacturer-provided start-up procedure for the installed system. This will include electrical motors, motor supply cables and controller, mechanical gear, and tracking system calibrations and accuracies.

5. Inspect and energize low-voltage to medium-voltage pad-mount transformers in accordance with manufacturer recommendations. These will include resistance measurements, turns ratio measurements, and insulation tests.
6. Inspect and test medium-voltage AC collector system cables for phase connections, conductor continuity, and insulation levels.

2.7.5 ORIENTATION, SPACING, AND COLOR

The array blocks are described in Section 1.3.3. The axis of each array tracker will be mounted in a north-south direction. The axis will rotate so that the collecting surface follows the sun during the day.

Spacing between the arrays in an east-west direction will be 16 feet, on center. Spacing between the arrays in the north-south direction will be at least 10 feet.

The front surface of the collectors will appear dark blue or black. The color of the rear surface has not yet been determined but will most likely be white. The panels will be mounted on aluminum frames and attached to corrosion-resistant steel tracker structures.

2.8 Thermal Power Plant Construction

Construction of a thermal power plant is not required for this Project. Construction of the Project is discussed in Sections 2.7, 2.9, 2.10, and 2.12.

2.9 Gravel, Aggregate, Concrete Needs, and Sources

Concrete will only be required for building or structure footings/foundations and pads for inverters, transformers, water tank footings, and substation equipment. Site soils were tested for pH, soluble sulfate content, soluble chloride content, and electrical resistivity to determine if the concrete would require special additives due to the presence of corrosive soils (DYA 2010). The results were compared to Caltrans Criteria for Corrosive Materials and found to be classified as non-corrosive. Therefore, Type II cement can be used in accordance with California Building Code 1904.3.

The total volume of concrete is estimated to be approximately 12,000 cubic yards. Specifications for the concrete will be determined during Project engineering, but will meet all applicable building codes. If an on-site batch plant is used, operations would comply with the site-specific SWPPP and *California Stormwater BMP Handbook Section NS-16, Temporary Batch Plants*. Furthermore, stockpiled materials would be delivered in accordance with *BMP Handbook Section WM-1, Material Delivery and Storage,* and used in accordance with *Section WM-2, Material Use.* Concrete waste would be managed in accordance with *California Stormwater BMP Handbook Section WM-8, Concrete Waste Management.* CSM will prepare a concrete Housekeeping Plan if it is determined that an on-site batch plant will be used. As an option to importing all aggregate materials, CSM will consider purchasing aggregate in-situ through a mineral materials sale from BLM (if commercial quantities exist in the Project area and if consistent with BLM's land use plan). This would reduce off-site impacts and truck traffic on local roads and I-15. CSM will discuss this possible alternative with BLM when determining specific actions under the EIS/EIR.

2.10 Electrical Construction Activities

The Project will require installation of 34.5-kV collection lines under I-15 from T12N, R7E, Section 12 to the substation on the west side of I-15 to connect the bulk of the Project output to the switchyard and transmission lines located to the west of I-15. The route of 34.5-kV collection lines, the switchyard, the 500-kV transmission lines, and the substation are all part of the overall ROW grant.

As discussed in Section 3, the existing LADWP high-voltage lines will be used to accept energy generated by the Project.

2.11 Aviation Lighting

2.11.1 POWER TOWERS

The proposed Project will not require solar power towers.

2.11.2 TRANSMISSION

The tallest objects proposed by the Project are the transmission lines, anticipated to be approximately 70 feet above ground, and are not anticipated to require specialized aviation lighting according to Federal Aviation Administration (FAA) regulations.

2.12 Site Stabilization, Protection, and Reclamation Practices

The Geologic Characterization Report for the project (Wilson Geosciences, Inc. 2011) shows that the site is largely underlain by young or weathered intermediate-age alluvium that typically ranges in grain size from silty sand to poorly graded gravel. This finding was confirmed by a series of 15 soil borings conducted across the Project area (DYA 2010). Given these conditions, soil stabilization may not be required during construction. In areas where clearing and grubbing is required, stabilization efforts may include compacting the native materials to make a hard crust that is resistant to wind erosion.

2.12.1 SOIL REPLACEMENT AND STABILIZATION

During site development, surface runoff, which currently flows across the site, will be diverted around the site and released to natural drainage. The diversion will help minimize erosion in the panel areas. Fugitive dust will be controlled in accordance with a plan as required by the MDAQMD.

The Project approach to construction is to alter site grades as little as possible to accommodate the placement of site infrastructure. Grading will be limited to constructing a grid of access roads constructed of compacted native soils. These roads will be constructed at grade to maintain existing sheet/shallow flow through the site during storm events. In select locations of the site, cut-and-fill will be required. These areas will be compacted to form a hard, stabilized crust. Fugitive dust will be controlled via a future plan as required by the MDAQMD.

Topsoil encountered during construction activities will be segregated from the subsoil and windrowed or thinly piled on site, then seeded and otherwise protected from wind erosion. The

topsoil will not be covered with plastic sheeting. Topsoil will be spread back over the site during site reclamation.

A site-specific vegetation survey has been conducted and submitted to BLM (URS 2009). Protected or important plant species located on site may require the development and implementation of a mitigation plan that may include temporary curation and replanting after construction is completed. Mitigation plans for on-site plants protected by the CDNPA or San Bernardino County will be submitted to the County for review and approval.

2.12.2 SEEDING SPECIFICATIONS

If required, seeding will be undertaken in conformance with BLM requirements.

2.12.3 FERTILIZER

Fertilizer is generally not used in desert environments such as the Project area and will not be used on the Project site.

2.12.4 LIMITING ACCESS TO ROW

The Project site will be fenced to help prevent access by the public. Gates will be installed at the roads entering the ROW. Limiting access to the ROW will be necessary both to ensure the safety of the public and to protect the solar arrays and equipment from potential vandals.

CSM believes that Rasor Road will need to be rerouted around the proposed areas where the energy facilities and other infrastructure will be located. The proposed rerouting would have Rasor Road run along the southern edge of the South Array.

2.12.5 TERMINATION AND RESTORATION

When the Project reaches the end of its useful life, structures and equipment will be removed for reuse, or sold as scrap, and the land surface will be reclaimed.

2.12.6 REMOVAL OF STRUCTURES

CSM will comply with the terms and conditions of the ROW grant. Upon decommissioning, aboveground structures will be dismantled and removed from the site. Where required, concrete pads or foundations will be demolished and rubble will 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 from the BLM. CSM will prepare and implement a site restoration plan addressing removal of structures in conformance with BLM requirements at the time of decommissioning.

2.12.7 ROADS AND PV BLOCK SITES

New Project access roads and corridors will be closed. The PV block sites will remain stable and vegetated throughout the operational life of the Project. Upon removal of aboveground facilities, the vegetation will be allowed to restore itself to its natural condition without intervention. CSM will prepare and implement a site restoration plan addressing roads and the PV block sites in conformance with BLM requirements at the time of decommissioning.

2.12.8 STABILIZATION AND REVEGETATION OF DISTURBED AREAS

The substation and office/storage areas will be graded to approximate the natural contour. CSM will prepare and implement a site restoration plan addressing stabilization and revegetation of disturbed areas in conformance with BLM requirements at the time of decommissioning.

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3: Related Facilities and Systems

This section provides information on additional facilities and systems necessary for construction and operation of the proposed Project.

3.1 Transmission System Interconnect

This section describes the existing and proposed transmission system and the status of power purchase and interconnection agreements needed to allow the Project to interconnect to the existing high-voltage transmission system. Communication and other infrastructure, such as gas and electrical supply sources, are also discussed.

3.1.1 EXISTING AND PROPOSED TRANSMISSION SYSTEM

The proposed interconnection of the Project to the existing high-voltage transmission system will involve one of the two lines immediately adjacent to the Project site. Therefore, no new transmission lines are proposed to be built other than the transmission facilities on the Project site that are described in this section.

Existing Transmission Lines

Two high-voltage transmission lines traverse the valley in which the Project area is located, immediately to the west of the Project site:

- **Market Place-Adelanto ("M-A"):** This 500-kV line is owned by a consortium of publicly owned utilities in southern California. It is managed by LADWP, the largest owner of the line. This transmission line runs parallel to I-15 along the northwest side of the Project area. LADWP has informed CSM that there is adequate transmission capacity available on this line to accept power generated from the Project.
- **Eldorado-Mountain Pass-Baker-Dunn Siding-Coolwater-Kramer line:** This 115-kV line is owned by SCE and controlled by CAISO. It runs adjacent to the M-A line within the valley where the Project site is located. The Project is located between the Baker and Dunn Siding substations along this line. Total capacity of this line is substantially less than the power that would be generated by the Project and the line currently operates at capacity. Upgrades would be necessary for it to be able to accept power from the Project.

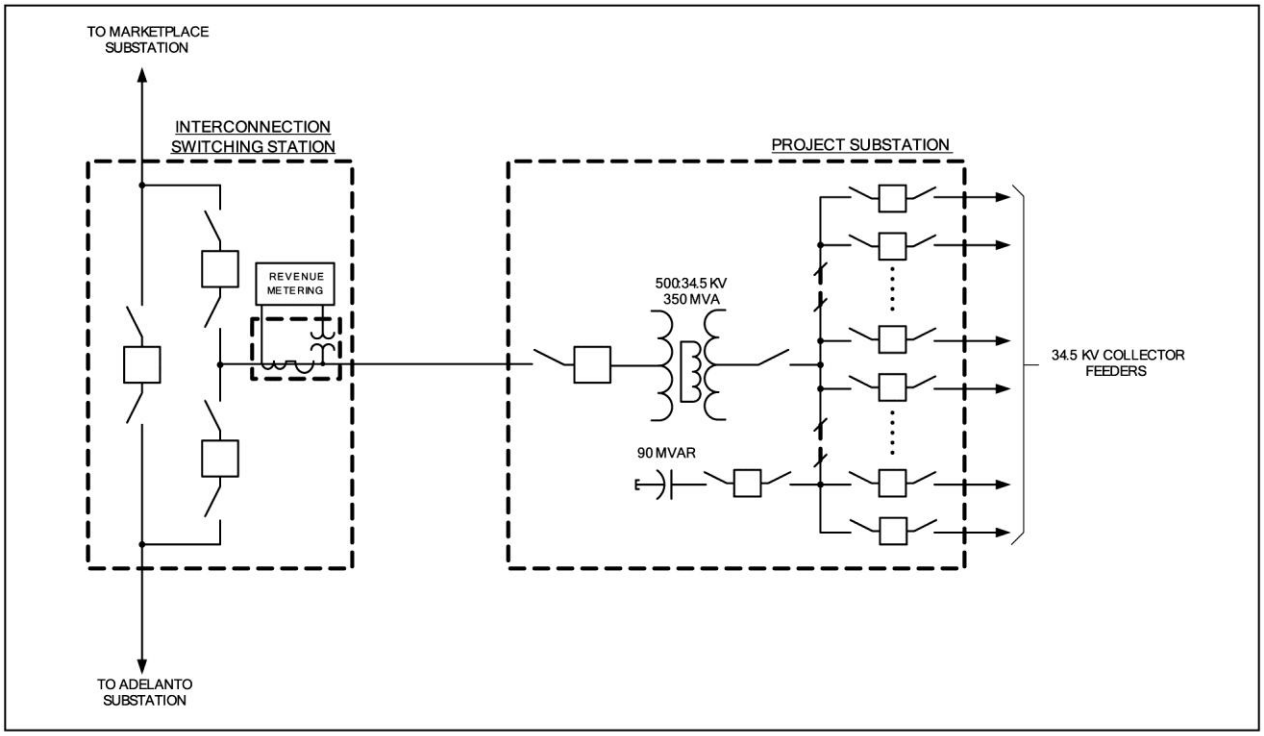
As described in Section 3.1.4 below, both the Feasibility Study (Appendix F) and System Impact Study (Appendix G) analyzing the impacts of interconnecting the Project to the LADWP M-A line have been completed and were submitted to BLM in 2009.

Proposed Transmission Facilities

Interconnection to 500-kV Transmission Lines

A collector substation will transform the 34.5-kV collection system voltage to 500 kV for interconnection with the LADWP transmission network. It will consist of the following major components (Figure 3.1-1):

Figure 3.1-1: One-Line Diagram 500 kV



SOURCE: Caithness 2009

- One or more 500:34.5 kV step-up transformers with an aggregate rating of approximately 350 MVA
- 500-kV circuit breaker(s) for high-side protection of the step-up transformer(s)
- Approximately 90 MVAr of switched capacitor banks on the 34.5-kV bus(es) to allow for unity power factor operation at the point of interconnection at full plant output
- 34.5-kV feeder breakers for termination of approximately 14 collector feeders
- Associated instrument transformers, protection, control, and communication equipment

The collector substation will interconnect to the M-A line at a newly constructed switching station in or adjacent to the existing M-A line easement. The switching station will use a three-breaker ring bus configuration. The substation and switching station will be electrically interconnected through a 500-kV overhead transmission line approximately 1 mile long.

Figure 3.1-1 shows a one-line diagram for the Soda Mountain Project, providing technical details for interconnecting the Project to transmission lines. This drawing, which shows the generator lead lines between the Soda Mountain Project switchyard and the transmission interconnection, addresses the potential interconnection with the 500-kV LADWP M-A line.

Power Transmission within the Proposed Facility

Underground 35-kV collector trenches will be located throughout the facility, as depicted in Figure 2.1-1. The current transmission design includes one group of cables from each of the three array areas, which connect to the planned substation.

Transmission System Connection Alternatives

CSM's primary interconnection option is to connect to the 500-kV M-A transmission line on the Project site. Both a Feasibility Study (Appendix F) and a System Impact Study (Appendix G) conducted by LADWP have confirmed that the Project could connect to this line with minimal upgrades to the transmission system required.

This interconnection option assumes power sales to some combination of the member utilities of the Southern California Public Power Agency (SCPPA).

Alternative Transmission Interconnection Possibility

Alternative Power Sales Opportunity

If a power sales opportunity required connecting the transmission system of CAISO, it may be necessary to construct a new 230-kV transmission line adjacent to the existing SCE 115-kV line going northwest from the Project site to the new Ivanpah Substation near Mountain Pass (Figure 3.1-2). Alternatively, such a line could be constructed along the existing SCE3 line to the southwest to Dunn Siding or further. The transmission line would be supported by H-Frame wood poles or light-duty steel poles 70 to 80 feet tall directly embedded into the ground. The distance between poles would range from 600 to 1,000 feet, depending on site conditions and topography, with a total transmission line length of approximately 50 miles.

The transmission line would be constructed either entirely on BLM land, or predominantly on BLM land with some segments crossing state lands.

This alternative would entail obtaining BLM approval and negotiated agreements for any state or private land crossings for the 100- to 160-foot-wide ROW. Activities on state lands would require agreements and coordination with the California State Lands Commission. Biological surveys for sensitive flora and fauna and cultural resource surveys would also have to be performed, along with design engineering.

Transmission Structures and Lines

The proposed alternative 230-kV transmission line would consist of 308 galvanized steel transmission structures that would support a double-circuit transmission line (two blocks of conductors) at the top. The transmission structures used for the alternative line would be likely be steel towers . The proposed structures would be 70 to 80 feet tall and comparable to the heights of the structures used for the surrounding existing utilities. Where needed, the applicant would reduce structure heights to cross other utilities while maintaining proper clearances.

If a power sales opportunity required connecting the transmission system of CAISO, it may be necessary to construct a new 230-kV transmission line adjacent to the existing SCE 115-kV line going northwest from the Project site to the new Ivanpah Substation near Mountain Pass (Figure

3.1-2). Alternatively, such a line could be constructed along the existing SCE3 line to the southwest to Dunn Siding or further. The transmission line would be supported by H-Frame wood poles or light-duty (LD) steel poles 70 to 80 feet tall directly embedded into the ground. The distance between poles would range from 600 to 1,000 feet, depending on site conditions and topography, with a total transmission line length of approximately 50 miles.

The transmission line would be constructed either entirely on BLM land, or predominantly on BLM land with some segments crossing state lands.

This alternative would entail obtaining BLM approval and negotiated agreements for any State or private land crossings for the 100- to 160-foot-wide ROW. Activities on state lands would require agreements and coordination with the California State Lands Commission. Biological surveys for sensitive flora and fauna and cultural resource surveys would also have to be performed, along with design engineering.

Access Roads

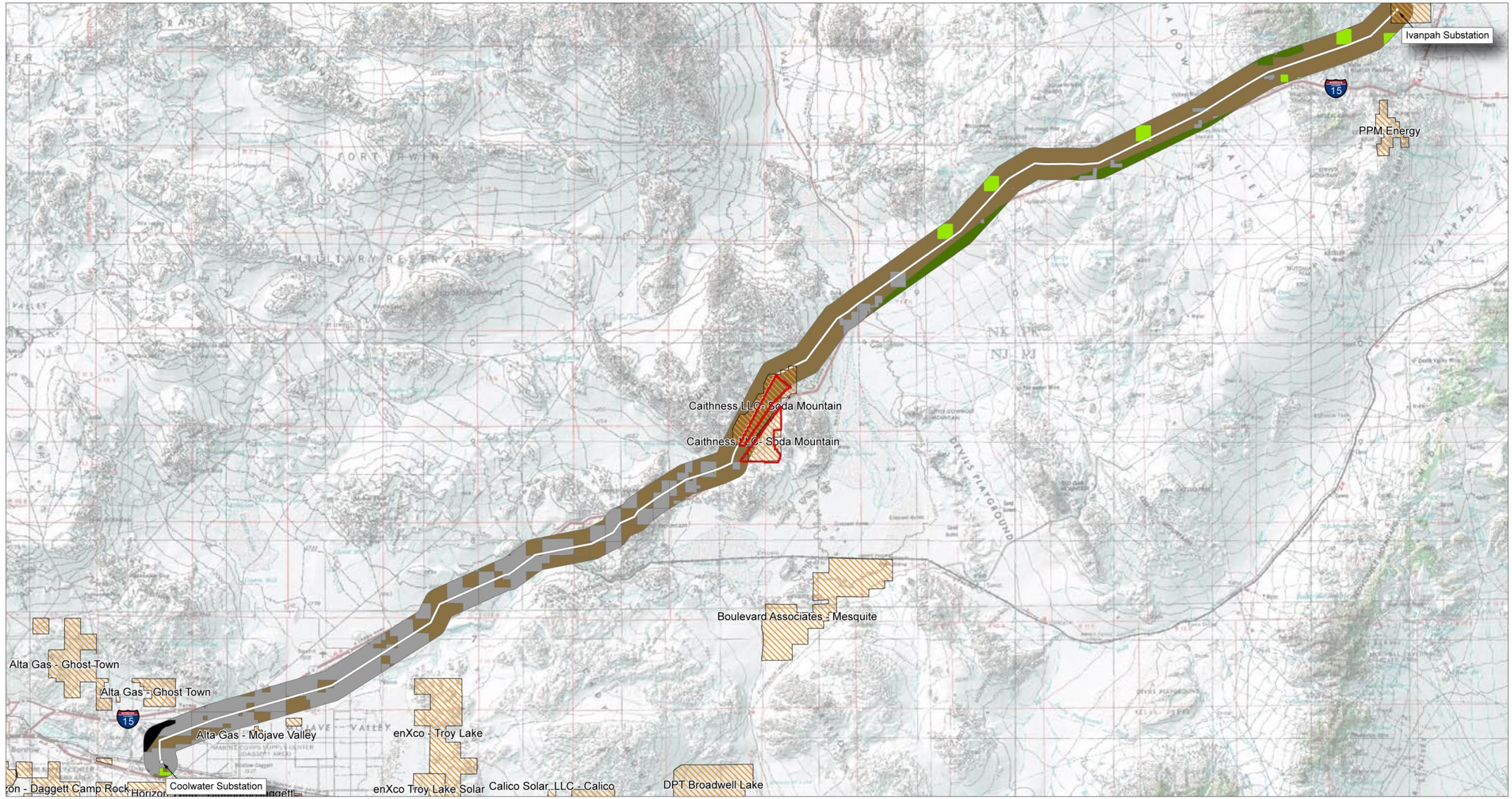
CSM will likely use the existing SCE access road along the existing 115-kV transmission line to transport construction materials for construction of the new line. The road system will include new spur roads to individual towers where the access road will need to deviate from the existing transmission line access due to topographic constraints. The access and spur road system will be maintained over the life of the facility and will be used for maintenance of the transmission line. In general, access and spur roads will be graded, unpaved roads that are at least 14 feet wide (7 feet from the road centerline). Access roads will follow the transmission ROW. Existing access roads will be used to construct the project wherever possible. Some portions of the existing access roads may require improvements or upgrades to allow passage of construction vehicles.

It is anticipated that most of the spur roads constructed to accommodate new construction will be left in place to facilitate future O&M activities. Roads will be used by maintenance crews and to inspect and maintain the transmission structures. These roads will be restored after construction by removing loose rock and slide material to construct dikes, fill washouts, or flatten fill slopes, and by filling or repairing all washouts, ruts, and irregularities. The roads will be maintained to facilitate drainage and use by construction and maintenance equipment.

Telecommunication System

A new transmission line will likely require installation of a telecommunication system. Installation will include the construction, operation, and maintenance of two fully redundant and geographically separated telecommunication paths along the alternative 230-kV transmission line. Both telecommunication paths will require installation of optical ground wire, which would provide the same grounding protection function as the overhead grounding wire (i.e., protect against lightning strikes and provide ground return for faults along the transmission line), and would also provide a communication circuit via a fiber cable embedded inside the wire.

Figure 3.1-2: Potential Interconnect Route



SOURCE: BLM 2011, Ventyx 2011, ESRI 2011, and RMT Inc. 2011

LEGEND

- Bureau of Land Management
- Military
- National Park Service
- State
- Unclassified
- SCE 115 kV Segment
- Substation
- Project Area Boundary
- BLM Verified Renewable Energy Project

0 5 10 15 20 Miles

RMT • ENVIRONMENT • ENERGY • ENGINEERING

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Transmission Line Construction Sequencing

Construction of a Soda Mountain Project to Ivanpah Substation 230-kV transmission line alternative would include the following steps:

- Conducting pre-construction surveys
- Site preparation and clearing the ROW
- Establishing ten construction yards and four helicopter staging areas
- Upgrading and establishing access and spur roads
- Preparing sites for the LST and H-frame structures
- Installing foundations for the LST and H-frame structures
- Assembling and erecting LST and H-frame structures
- Installing conductors (guard structures, wire stringing, pulling, tensioning, and splicing)
- Grounding
- Cleaning up and restoring the site

Each construction yard would be used as a reporting location for workers and for vehicle and equipment parking and material storage. The yards would have offices for supervisory and administrative personnel. Maintenance of construction equipment would be conducted at these yards. The number of workers reporting to any one construction yard is not expected to exceed about 100 workers at any time. Construction yards would range from 2 to 28 acres, depending on land availability and intended use.

The applicant would arrange temporary electrical and telephone connections at the construction yards with local electrical and communication service providers. Water also would be provided by local vendors. During the peak construction period, approximately 80 private commuting vehicles and the construction vehicles/equipment would also be parked at the construction yards. Crews would load materials onto work trucks and drive to the current construction location. At the end of each day, crews would return to the yard in their work vehicles and depart in their private vehicles. Materials stored at the construction yards would include:

- Conductors
- Wood poles and/or steel poles
- Optical ground wire cable
- Hardware
- Construction equipment
- Steel structural components
- Insulators
- Signage
- Fuel and joint compound
- SWPPP materials, such as straw wattles, gravel, and silt fences
- Waste materials for recycling or disposal

Due to greater efficiency and lower cost, conventional surface access construction methods would be used for transmission line construction. Helicopters would be mainly used during the transmission line stringing activities (i.e., sock or pilot line threading). A preliminary access plan and detailed engineering design would be prepared to identify specific structures and/or portions of the proposed transmission line that would require helicopters as an alternate method of construction. Final location of helicopter staging areas for the proposed project would be determined with the input of the helicopter contractor and affected land management agencies and any private land owners. The size of each material or helicopter staging area would depend on the size and number of structures to be installed. Staging areas would likely change as the work progressed along the transmission lines.

All areas that were temporarily disturbed by proposed project activities (including material staging yards, pulling and tension sites, and splicing sites) following the completion of construction would be restored. Restoration would include grading, restoring sites to original contours, and reseeding, where appropriate. In addition, all construction materials and debris would be removed from the area and recycled or properly disposed of off site. Monitoring restoration would be conducted for a given period after reclamation to assure that cleanup activities were successfully completed and satisfactory reclamation was achieved. During construction, water trucks would be used to minimize the quantity of airborne dust created by construction activities. Any damage to existing roads as a result of construction would be repaired once construction was complete.

Construction Period

If a new transmission line is required, construction of the access roads would begin in 2012 or 2013 after completing the environmental review and permitting process. Construction of the poles and installation of the first circuit of the 230-kV transmission line would occur in the spring, summer, and fall, as dictated by ground conditions and weather, and would last approximately 5 months.

3.1.2 ANCILLARY FACILITIES AND SUBSTATIONS

Substation-related Facilities

Ancillary facilities and substations required for the Project are discussed in Section 1.3.3. One O&M building and one substation will be constructed for long-term use at the Project site. The buildings will be located in the southwest corner of the south array area and the substation will be located to the north of I-15 adjacent to the 115-kV and 500-kV transmission lines.

Alternative Transmission Line Facilities

CSM proposes to connect to the 500-kV LADWP line via a new substation to be constructed on the Project site. The discussion regarding the alternative transmission line installation is provided in this POD in the event that Caithness obtains a power purchase agreement to sell power to a utility in the CAISO system (and does not connect to the LADWP M-A line on site).

Ancillary facilities required for the transmission line alternatives include access roads and laydown and tensioning sites.

Access Roads

New and improved access roads and unimproved overland access routes would be needed to move workers, vehicles, and equipment to the transmission line corridor during initial construction, and during inspection, maintenance, and repair of poles, insulators, and conductors. Existing unpaved access roads would be widened and new access roads would be constructed across BLM-administered lands and any state or private land parcels affected. These roads would be widened or constructed to a width of approximately 20 to 22 feet within a permanent 40-foot-wide ROW. The additional ROW beyond the 20- to 22-foot-wide travel surface would be needed to accommodate construction, reconstruction, drainage improvements, and shoulder work. Overland access routes would be required on private land, state lands, and BLM-administered land. Access roads would be located on terrain requiring minimal, if any, cut-and-fill. In those limited areas requiring cut-and-fill, appropriate erosion control measures would be implemented. Access roads would be maintained during construction and dust would be controlled using water or dust suppression chemicals. Any roads needed for continued transmission line O&M would be stabilized and use of overland roads would be monitored to avoid rutting. Those roads not needed for transmission line maintenance or public or administrative access would be reclaimed by recontouring, scarifying, reseeding, and barricading.

Laydown Areas and Tensioning Areas

Approximately five to ten laydown areas (i.e., temporary storage yards) would be needed for unloading, storage, and distribution of construction materials and transmission components, including poles, davit arms, insulators, and the conductor on reels. In addition, pulling/tensioning sites would be needed for the temporary placement of reel trailers and/or tensioning trucks/trailers during the installation of conductors. With the exception of the laydown area at the interconnection site all laydown areas would be located on BLM lands. Most pulling/tensioning sites would be located on BLM lands. Only limited surface preparation would be required at the proposed laydown areas or tensioning sites, such as vegetation crushing or light grading. Any resulting temporary surface disturbance would be restored following construction.

Construction of Interconnect Transmission Lines

Pole Placement

Poles and associated hardware would be transported to each pole location by flatbed truck. Assembly and mounting of associated line hardware would occur at each pole location. The assembled structures would then be raised by a crane and placed in the pre-dug holes. A pilot line would then be pulled (or strung) from pole to pole by a vehicle and/or helicopter and threaded through stringing sheaves on each pole. A larger-diameter, stronger line (the pulling line) would then be attached to the pilot line and strung. This process would be repeated until the conductor is pulled through all sheaves. The conductors would be strung using power-pulling equipment at one end and power-braking or tensioning equipment at the other end. Sites for tensioning equipment and pulling equipment would be located approximately 10,000 to 20,000 feet apart.

At each pole location, sufficient area would be needed to allow safe operation of construction equipment. At each pole location a temporary construction easement extending 10 feet beyond the

edge of the 150-foot-wide permanent ROW would be required. At locations where downguys would be installed (i.e., where the line changes direction), an additional 100 feet of temporary workspace would be required in two directions from the pole location to accommodate installation of structural supports. Each pole would occupy an area of approximately 400 square feet (a 10-foot radius around each pole). Vegetation within this area would be controlled to reduce fire danger. Other existing vegetation within the ROW (and temporary construction easements) could be disturbed during construction, but would not be permanently cleared. Following construction, disturbed areas would be restored to original condition using salvaged native vegetation and seed mixes approved by the BLM and the state (for areas within State of California lands).

Conductor Installation

During conductor installation, guard structures would be erected over any natural or manmade obstacles. Guard structures would consist of temporary H-frame poles placed on either side of the obstacle. These structures prevent ground wire, conductors, or other equipment from falling on an obstacle. Equipment for erecting guard structures includes augers, line trucks, pole trailers, and cranes. At minor road crossings other safety measures would be used, such as barriers, flaggers, or other traffic control.

Construction Period

Construction of the access roads would begin in spring 2012. Construction of the poles and installation of the first circuit of the 230-kV transmission line would occur in the spring, summer, and fall, as dictated by ground conditions and weather, and would last approximately 5 months.

3.1.3 STATUS OF POWER PURCHASE AGREEMENTS

There are three power sales options for the Project: (a) sales to some combination of member utilities of SCPPA, (b) sales directly to LADWP, and (c) sales to a CAISO utility. These options are discussed below.

Sales to SCPPA Member Utilities

SCPPA is a group of municipally owned public utilities in southern California. The group jointly procures or develops, owns, and operates various transmission and generation projects. SCPPA is the entity through which these projects are procured or developed. Each project is stand-alone and ownership percentages vary from project to project. LADWP is the largest member of SCPPA.

The M-A transmission line (adjacent to the Project site) is owned by a consortium of SCPPA utilities and managed by LADWP. Sales of power from the Project to members of SCPPA would physically occur though the M-A line.

Periodically, SCPPA issues procurements for renewable energy. Most recently, the utility issued a request for proposals (RFP) for renewable energy with a due date of January 31, 2011. CSM submitted a proposal in response to this RFP for the sale of power from the Project and is awaiting a response.

CSM anticipates that SCPPA will issue RFPs in the future and anticipates participating in those procurements as well, depending on the outcome of the current RFP.

Sales to LADWP

Although sales of power from the Project to LADWP could occur through a SCPPA RFP, they could also occur through a direct sale to LADWP.

LADWP is the municipal utility serving the City of Los Angeles. It is committed to procuring a substantial amount of power from renewable resources over the next decade. LADWP is also the largest single owner of the M-A line. As such, it is logical potential purchaser of power produced from the Project.

LADWP has issued RFPs for renewable energy, most recently in March 2009. The final response date for that RFP was November 2010. CSM issued a proposal to LADWP in response to the March 2009 RFP. However, in March 2010 LADWP determined that it would suspend proceeding with negotiations with large renewable projects pending the preparation of an Integrated Resource Plan (IRP). The IRP would be focused on indentifying a long-term strategy for procuring renewable energy and phasing out coal generation. A draft IRP was issued in summer 2010 and laid out various scenarios of renewable power procurement and the environmental and cost consequences of the various scenarios. The IRP continues to undergo review and has not yet been finalized.

It is CSM's intention to work with LADWP with respect to power sales under a continuation of the preceding RFP or through any new RFP LADWP may issue.

Sales to CAISO Utilities

Discussions have also been held with the three major investor-owned utilities in California (SCE, SDG&E, and PG&E) regarding the sale of power from the Soda Mountain Project. Under the California Renewable Portfolio Standard, as implemented under the rules of the CPUC, these utilities are under a mandate to purchase an increasing amount of renewable power every year until 2020. They accomplish this by issuing annual Requests for Offers and conducting reverse auctions to select renewable energy projects and to enter into power purchase agreements.

Among the investor-owned utilities, SCE is the most logical choice because the M-A line leads toward SCE's major road center. However, power sales to SCE would necessitate transfer of power from the M-A system to the CAISO-controlled transmission lines, thereby introducing complications related to firmness of capacity. For this reason, emphasis is currently being placed on sales of power to SCPPA utilities.

3.1.4 STATUS OF INTERCONNECT AGREEMENT

Transmission Lines Adjacent to the Project Site

As outlined above in Section 3.1.1, two major high-voltage electric utility transmission lines are adjacent to the Project site.

The 115-kV Eldorado-Kramer line, owned by SCE, is an old transmission line with limited power-carrying capacity. SCE plans on upgrading the Eldorado-Ivanpah (new substation) section of this line to accommodate a new solar project. There are no current plans to upgrade the portion of this line that is adjacent to the Project site. For this reason, emphasis has been placed on

interconnecting the Project to the 500-kV M-A line, which has adequate capacity to accept power from the Project. The option to interconnect to the Eldorado-Kramer line is discussed elsewhere in this POD.

Status of M-A Line Interconnection Studies

In March 2008, the Project submitted an Interconnection Request application to LADWP, the operator of the M-A line, to interconnect the Project to the M-A line. The application was deemed complete and was accepted. Based on the application submittal date, the Project is second in line in the queue of projects requesting interconnection to this line.

LADWP has a multi-stage process for evaluating interconnection with and contracting for interconnection with generating facilities. The process involves a sequential set of studies: Feasibility Study, System Impact Study, and Facilities Study. Following the completion of these studies, an Interconnection Agreement is executed.

In June 2008, an initial scoping meeting was held with LADWP to discuss issues that may arise with respect to interconnecting the Project to this line, and to discuss the timetable for the studies needed to determine how the Project can safely be connected to this line. Following this meeting, CSM prepared and submitted data requested by LADWP for the Feasibility Study.

Since that time both a Feasibility Study and a System Impact Study were performed for the Project by the Power System Planning & Development group in LADWP's Transmission Planning and Studies Department. The Feasibility Study (LADWP 2009a) was completed in June 2009 and the System Impact Study was completed in October 2009 (LADWP 2009b).

The conclusions of these studies with respect to system impacts are summarized as follows:

> "Based on the provided models and with the assumption of maximum steady generation at the Soda Mountain Solar Project, no adverse system impacts were found with the Project interconnection at Soda Mountain substation in terms of transient and post-transient stability. System performance meets all Los Angeles Department of Water and Power Soda Mountain Solar Project – System Impact Study Page 13 10/21/09 – the applicable NERC/WECC reliability standards under normal, (N-1) and (N-2) contingency conditions."
>
> "The Soda Mountain Solar Project interconnection meagerly increases both three-phase and single-phase duties at several stations in the vicinity of the M-A line. These increased duties do not exceed the existing interrupting capabilities of the breakers at these stations."[8]

The conclusion of the System Impact Study (LADWP 2009b) with respect to required system additions is summarized as follows:

> "Minimum system additions required for the interconnection of the Project should comprise of three circuit breakers and six disconnect switches to form a ring bus at the interconnection site."[9]

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[8] *"Soda Mountain Solar Project—System Impact Study,"* Los Angeles Department of Water and Power, October 21, 2009, pp 12-13.

[9] Ibid, p. 6.

In short, there are no significant interconnection-related impediments to interconnecting the Project to the M-A transmission line.

3.1.5 GENERAL DESIGN AND CONSTRUCTION STANDARDS

CSM will follow BLM design and construction standards where applicable. Where BLM relies on San Bernardino County building design and construction standards, CSM will follow those County standards.

3.2 Gas Supply Systems

Natural gas will not be used as a part of the proposed Project. CSM will use electrical power rather than gas as a primary source of space heating as may be required for buildings. If appropriate, a solar hot water heater and solar thermal storage will be used to the extent practicable for a majority of heating loads in buildings.

3.2.1 BACKUP NATURAL GAS GENERATION REQUIREMENTS

No backup natural gas will be needed for this Project.

Approximately one 500-gallon diesel tank or 50-cubic-foot propane tank will be kept on site permanently for use for emergency generation in the event of an electrical outage. The emergency generator will be located adjacent to the ancillary buildings on the southwest side of the Project site.

3.2.2 PIPELINE ROUTING CONSIDERATIONS AND CONSTRUCTION STANDARDS

No new gas pipelines are proposed to be constructed as a part of the Project.

3.2.3 METERING STATIONS

No natural gas pipelines are proposed, and thus no metering stations will be required.

3.3 Other Related Systems

3.3.1 FUEL

An existing service station (Beacon Station) located at the intersection of I-15 and Rasor Road will supply the bulk the Project's gasoline and diesel needs during construction and operation. The 24-hour fuel service station provides unleaded gasoline, diesel fuel, and off-road vehicle racing fuel, and also includes a convenience store. Based on conversations with the owner of the service station, the existing fuel storage capacity at the service station is more than adequate to supply the fuel needs of the Project.

During construction, a portable on-site diesel storage container may be located on site. A small amount of fuel may be stored on site throughout the life of the Project. Should fuel be stored on site during construction or during the life of the Project, CSM will address this within the site-specific SPCCP.

3.3.2 COMMUNICATIONS SYSTEM

This section provides background information on the communications system associated with the proposed Project, during both construction and operations.

Construction and Operation

The Project will be operated and monitored by means of a Supervisory Control and Data Acquisition (SCADA) system located in the control building. Sensors located at each inverter/tracker combiner will report operational parameters. Data access and inverters are controlled, either on site or remotely, through a high-security system. The non-conductive fiber optic communications cable will be co-located with the low-voltage DC and AC wiring to reduce environmental impacts.

Personnel communication will use two-way radio/receptor stations, which will require a Federal Communications Commission (FCC) license. A security camera system will monitor solar panels and equipment throughout the site.

4: Operations and Maintenance

4.1 Operation and Facility Maintenance Needs

Operational needs at the site include monitoring and optimizing the power generated by the solar arrays and interconnection with the transmission lines, operating the solar array tracking system, and conducting panel washing activities periodically through the year. Nighttime security and monitoring personnel will be employed.

Maintenance activities will include inspecting, repairing, and maintaining the arrays and tracking systems and the SCADA system, and washing panels. Additional maintenance will be required to maintain the administrative buildings, fencing and signage, roadways, and other ancillary facilities at the site. The majority of planned maintenance activities will be performed before sunup, with repairs made at sundown.

O&M of hydraulic structures will be conducted two times per year, and following any extreme storm event. Activities will include inspecting and repairing channels.

O&M of the interconnect transmission line will be conducted on a regular basis. Miscellaneous damage repair due to failure of conductor splices, lightning strikes, wildfires, high winds, or vandalism may also be conducted.

4.2 Maintenance Activities

4.2.1 SOLAR PANEL WASHING

Dirt and dust will accumulate on solar panels over time, leading to degradation of power output. To maintain power output at acceptable levels, it is necessary to wash the panels periodically throughout the year. Section 1.3.6 provides a description of planned washing techniques, frequency, and water use.

A non-concentrating, flat-plate PV panel system, as proposed for this Project, is anticipated to require less maintenance activity and water consumption associated with cleaning than would be needed for a concentrating mirror system because it can be expected that a given accumulation of surface dust/dirt will attenuate less light in a non-concentrating system than in a concentrating system where the directionality of light is critical.

For the purposes of this POD, the water consumption quantities provided for panel cleaning were based on Solar Energy Generating System (SEGS) data. SEGS is a solar thermal project employing trough-shaped linear parabolic mirrors, has been operating since the mid 1980s, and has established a long operating record. It is CSM's expectation that, because the Project employs PV panels, it will be able to achieve a lower level of water consumption for collector cleaning than needed by SEGS.

4.2.2 ROAD MAINTENANCE

Roadways throughout the site will be primarily unimproved and vehicular traffic throughout the site will be infrequent. Therefore, minimal maintenance is expected. After major rain events, at-grade crossings of existing channels will be evaluated and maintenance efforts will be conducted as needed. Dust will be controlled using appropriate measures, such as polymer application, as needed.

4.2.3 INTERCONNECT TRANSMISSION LINE MAINTENANCE

O&M activities would include aerial and ground patrol of the lines, climbing inspections, pole and conductor maintenance, and repair of access roads. The ROW will not be chemically treated to control vegetation unless necessary to comply with requirements of a permitting agency.

4.3 Operations Workforce and Equipment

During operations, it is anticipated that the Project will require a workforce in the range of approximately 25 to 38 workers, which include a mix of professional staff and maintenance and security personnel. Final staffing levels and configuration will be based on the final site configuration and early operating and maintenance experience. An initial estimate of the staff configuration is summarized in Table 4.3-1, below.

Table 4.3-1: Operating Personnel for 350-MW Facility

Professional Staff	**Number of Persons**
Plant Manger	**1**
Operators (four shifts)	**8**
Engineer	**1**
Foreman	**2**
Administration	**2**
Accounts/Billing	**2**
Maintenance/Security	**Number of Persons**
Technical Maintenance	**6**
Unskilled Maintenance	**12**
Security	**4**
Total	**38**

5: Environmental Considerations

Figure 5.1-1 shows a preliminary inventory of environmental constraints relevant to the Project area. Table 5.1-1 lists resources potentially affected by the Project. This table also provides a list of environmental protection measures that are proposed to reduce the potential adverse effects of the Project. In addition to the environmental protection measures identified, the Project will adopt the applicable BMPs that may be applicable to the Project from the assessment that BLM and U.S. Department of Energy are conducting for solar energy projects on public lands. The Project will also adopt the recommendations of technical reports (e.g., geotechnical).

5.1 Site Characteristics and Potential Environmental Issues

Section 5.1.1 provides a general description of site characteristics as they relate to potential environmental issues associated with Project construction and operations. In addition, studies previously undertaken were reviewed and their results incorporated. The Biological Resources Technical Report (BRTR) and associated surveys were previously submitted to the BLM by URS; a list of these documents is included in Appendix C. During the preparation of the BRTR and the associated surveys, URS discussed the appropriate protocols to use with the BLM. The survey methods and protocols were further discussed within the BRTR and associated documents. CSM representatives will meet with the BLM to determine if qualified environmental monitors will be required on site during construction activities.

5.1.1 SENSITIVE SPECIES AND HABITATS

California Natural Diversity Database (CNDDB) Review

Prior to performing field surveys, a review of the CNDDB was conducted. This review is summarized in the BRTR prepared by URS. A recent review (2011) of the CNDDB showed no new species identified since the 2009 submittal of the POD.

The Project will result in semi-permanent disturbance (for the life of the solar facility) of the desert scrub habitat that is currently present on the Project site. These impacts are not expected to be significant considering the current widespread occurrence of this habitat type.

No special-status wildlife species were documented in the CNDDB in the quadrant containing the Project area; however, several California species of special concern and two BLM sensitive species (pallid bat and Nelson's bighorn sheep) were documented in adjacent quadrants. Although the Project area is not designated as desert tortoise critical habitat, the review indicated that desert tortoise may still be present in the Project vicinity. Based on this review it was determined that surveys should be conducted to assess potential impacts to special-status species. During the 2009 desert tortoise field survey conducted by URS, no direct evidence of desert tortoise was observed within the Project boundaries; scat was identified west of the project area (see Desert Tortoise report referenced in Appendix C).

According to the review, 12 special-status plant species may occur within the USGS quadrangles surrounding the study area. Three of the 12 special-status plant species were determined to have a

low potential for occurrence. The remaining nine special-status plants were determined to have a "moderate" or "high" potential for occurrence due to the likelihood of suitable habitat occurrence within the study area limits. None of these special-status plant species are listed as state or federally threatened or endangered.

The review also found that 14 special-status wildlife species may occur within the USGS quadrangles surrounding the study area. Ten of the 14 were determined to have a low potential for occurrence. The remaining four special-status wildlife species were determined to have a "moderate" or "high" potential for occurrence within study area limits. One of the four special-status wildlife species is the desert tortoise, which is listed as state and federally threatened; however, the Project site is not a known desert tortoise habitat.

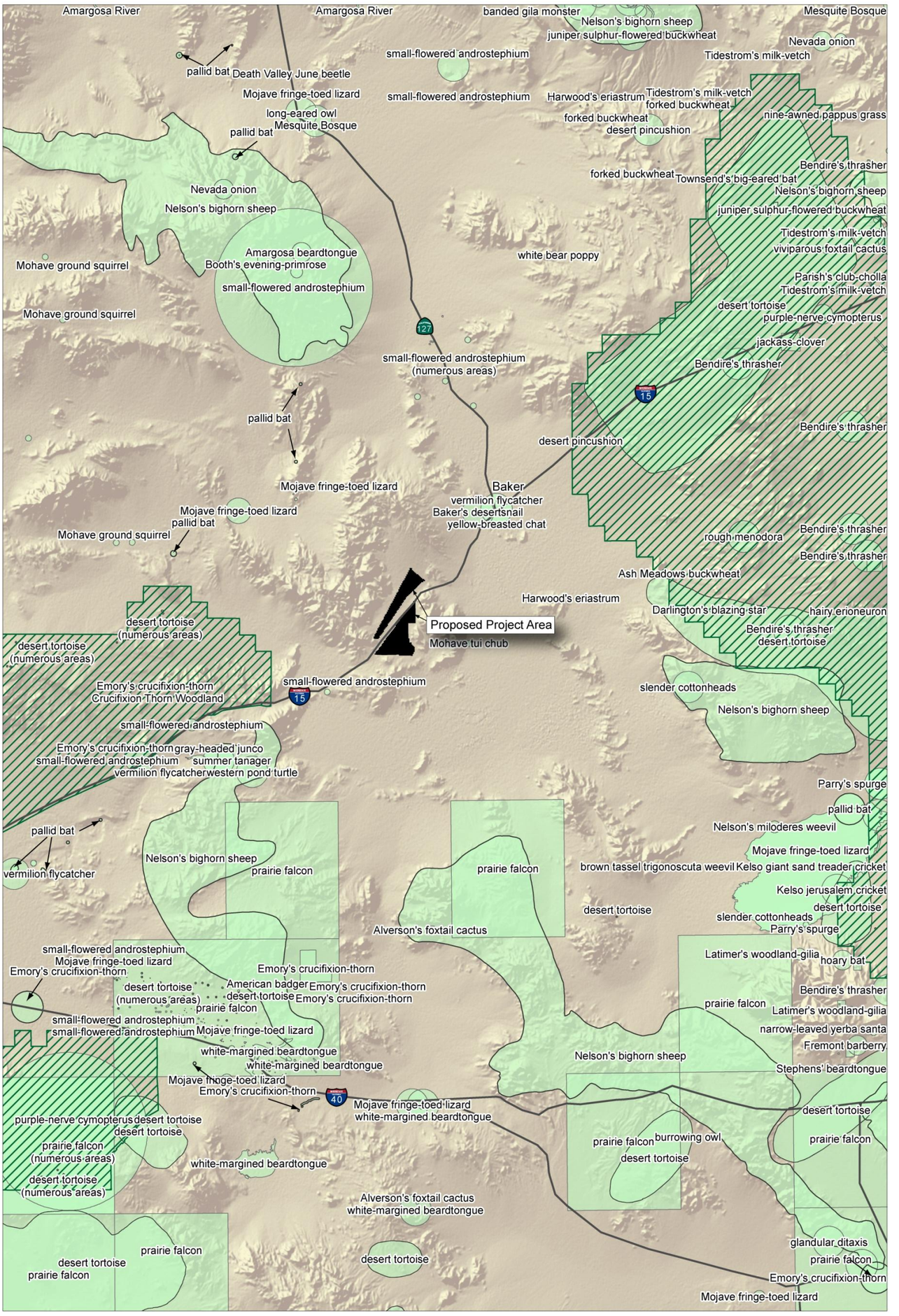
Field Surveys

Based on the CNDDB review, surveys were conducted for desert tortoise, MFTL, special-status plant species, and certain avian species in order to characterize the wildlife and habitat on site. These surveys were discussed in further detail in the BRTR and its appendices (listed in Appendix C).

Summary findings of the surveys are as follows:

- **Desert tortoise:** No indication of a desert tortoise population was found within the proposed Project boundaries. One tortoise scat was observed along the 1,200-foot-long (366-meter) zone of influence transect outside of the western portion of the study area. This suggests that desert tortoise may be present within the region outside of the study area in low densities, between areas designated as USFWS critical habitat and BLM Desert Wildlife Management Areas (DWMAs). Desert tortoises have been observed at the Caltrans Opah Ditch Mine, which is located west of the Project site. The findings at the Opah Mine site are further discussed in the desert tortoise report referenced in Appendix C.
- **Mojave fringe-toed lizard:** Field evaluation suggests that MFTLs are currently present in the northern and southern regions of the study area outside of the Project site boundaries, but biologists did not observe MFTLs on the Project site. Additionally, MFTL habitat was not identified adjacent to the Project site during these surveys either, which implies that the MFTLs within the northern and southern regions of the study area are not directly linked through the corridor region. Because no MFTL habitat was found within the Project footprint, the question arises of whether the Project footprint is nevertheless a sand source, or could become a barrier to aeolian deposits where MFTLs are present in the areas surrounding the Project. This question follows the model proposed by Barrows (1996) regarding the protection of a dune ecosystem. Clarke (1995) asserts that the aeolian sand source for these areas originates in the Mojave River Sink from Afton Canyon to Kelso Dunes, which eliminates the Project footprint as the sand source. The dominant wind direction (and assumed direction of sand deposit movement) in this region is west-northwest (Sharp 1966). Consequently, the Project is not expected to impede sand recruitment for the MFTL habitats in the study area, nor will it likely serve as a barrier to future MFTL habitat movement in the study area. The panel layout has been revised from the panel design proposed when URS prepared the draft MFTL Report

Figure 5.1-1: Environmental Constraints



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to decrease the potential for the development to restrict sand deposits. The revised panel layout does not impact or restrict on-site drainages and is not expected to impede sand recruitment. Final engineering plans for the Project will be developed with input from the BLM to minimize the potential for the Project site to act as a barrier to sand movement.

- **Special-status plants:** No federal- or state-listed threatened or endangered species were found within the study area during the 2009 focused plant surveys. Emory's crucifixion thorn, *Castela emoryi*, (CNPS list 2.3) and Utah vine milkweed, *Cynanchum utahense* (CNPS list 4.3), were the only rare plant species observed during the 2009 focused plant surveys. These species are not listed under the federal or California Endangered Species Act as protected species.
- **Avian:** Avian point counts were conducted in the spring and fall of 2009 in accordance with BLM Barstow Field Office-approved protocol. During the spring surveys, 22 different species of birds (629 total birds) were observed, including the loggerhead shrike, which is considered a California state species of concern. A total of 23 species (210 total birds) were observed during the fall surveys. Spring point counts observed total bird populations that were approximately three times greater; however, the species diversity was relatively similar. The loggerhead shrike was observed during the fall surveys as well. No federally listed endangered or threatened species were observed within the study area during spring or fall avian surveys.
- **Desert bighorn sheep:** A literature search and spatial analysis were completed to determine if the Project has the potential to adversely affect this species. CSM plans to conduct spring surveys for bighorn sheep, in accordance with CDFG protocol. A memo documenting the findings of the survey will be submitted to the appropriate agencies.
- **Golden Eagle:** Golden eagle are known to occur 9.5 and 9.9 miles from the project area (BLM 2011). golden eagle survey will be conducted concurrent with the bighorn sheep survey. A report documenting the findings of the survey will be submitted to the appropriate agencies.

Jurisdictional Determination

A Preliminary Jurisdictional Determination Report was prepared by URS and submitted to the BLM (referenced in Appendix C), for those lands likely subject to CWA and CDFG Code Section 1600 (et. seq.) jurisdiction, to determine Project implementation effects on these features. No wetlands were determined to be located within the study area. The report identified 1,244 acres of desert wash within the study area. Based on the URS analysis, these 1,244 acres are subject to the Regional Water Quality Control Board Porter-Cologne Jurisdiction and CDFG Section 1600 et seq. jurisdiction. The Preliminary Jurisdictional Determination Report was submitted to the ACOE, Los Angeles Regulatory Division, on October 20, 2010. CSM is currently awaiting a response from the ACOE.

Construction and Operating Protocols

During construction, the site will be under continual surveillance by the supervising construction staff and environmental monitoring staff. Special inspections and/or monitoring, if applicable for particular species (e.g., desert tortoise), will be conducted in conformance with the environmental protection measures adopted by the Project (Table 5.1-1). However, the Project

Table 5.1-1: Statutory Requirements and Projection Measures

Statutory Requirements/Other Resources	Project Effect on Resource	Environmental Protection Measures
Statutory Requirements		
Air Quality		
Fugitive Dust Emissions	A large portion of the surface of the Project area will be disturbed during construction activities. Limited vehicle access will occur on unpaved roads and access corridors over the operational life of the Project.	A Fugitive Dust Suppression Plan will be developed and implemented in conformance with MDAQMD requirements, and will detail control measures to reduce fugitive emissions from construction and operational activities, including, but not limited to, watering of unpaved roads and other disturbed surface areas, restricted vehicle speed limits, windbreaks, transport container covers, and cleaning and maintenance procedures.
Vehicle Emissions	During the construction phase, approximately 2,000 truckloads of construction materials will be delivered to the Project area per month (about 72,000 truckloads over 3 years for the entire 350 MW Project). This estimate does not include general construction vehicles or commuting laborers. In the event that water is unavailable on site, water transport trucks will also be required.	During preparation of the EIS, emissions calculations for construction and operational phases will be produced through predictive models. These calculations will determine conformance with the U.S. Environmental Protection Agency Clean Air Act and the California Clean Air Act.
Cultural Resources		
Prehistoric and Historic Cultural Resources	A preliminary discussion of cultural resources in the Project vicinity with BLM Barstow Field Office archeologist Jim Shearer suggests that the Project area may contain significant cultural resources.	During field surveys, two cultural resources sites were found within the ROW; however, CSM will be constructing fencing around these sites to avoid disturbing them. The sites will not be impacted during construction or operation of the Project.

Table 5.1-1 *(Continued)*: Statutory Requirements and Projection Measures

Statutory Requirements /Other Resources	Project Effect on Resource	Environmental Protection Measures
Statutory Requirements		
Environmental Justice		
Environmental Justice	There are no permanent residents on or near the Project site. Communities further away, in the Newberry-Baker subdivision of San Bernardino County, may contain higher than average African-American, but lower than average Hispanic populations, when compared to the state and local County numbers. Baker residents with incomes below the property level represented 22.6 percent in 2007, almost twice as high as the percentage for California and Nevada, and for San Bernardino and Clark counties. With one exception, however, no significant adverse human health and environmental effects that cannot be mitigated with implementation of the appropriate mitigation measures have been identified. The exception is visual resources, where the presence of the solar array field and its associated facilities would substantially degrade the existing visual character or quality of the site and its surroundings. The population affected by this degradation would consist of travelers on I-15, which would bisect the solar array field, and recreationalists using the neighboring OHV park. Baker is located 6 miles northeast of the Project site; consequently residents of Baker, whether living below the poverty level or not, would not be directly affected, and so no disproportionate	None

Table 5.1-1 *(Continued)*: Statutory Requirements and Projection Measures

Statutory Requirements /Other Resources	Project Effect on Resource	Environmental Protection Measures
	impacts to minority and/or low-income populations are expected.	
Floodplains		
Desert Washes	The Project site is located in a desert environment, so there are no surface waters most of the year. The Project area contains washes that periodically carry water during infrequent rain events. It will likely be necessary to construct unpaved roads that cross these washes in several places.	To the extent practicable, the Project will avoid placing PV blocks and other structures in major washes. The Project will correspond with the ACOE and implement any relevant measures required by ACOE to protect Waters of the United States. The Project proponent will consult with the CDFG to assess the potential need for a Streambed Alteration Agreement for impacts to any jurisdictional waters.
Floodplains	Based on the basic topography of the area, it is not likely that the Project area is prone to collect standing water.	The Project facilities would not be located in floodplains. BMPs will be developed and implemented for construction, post-construction, and operational phases to maintain runoff integrity. The Project will conform to all appropriate requirements with respect to stormwater runoff requirements during construction and during normal operations, as applicable. This will include preparing a SWPPP and implementing appropriate stormwater BMPs. The SWPPP will use control measures, as necessary, such as drainage channels and ditches, stabilized construction entrances, gravel-covered construction staging area, and silt fencing.
Invasive, Nonnative Species		
Introduction of Invasive, Nonnative Species	Soil disturbance and construction and operational activities could introduce invasive nonnative	Applicant will develop and implement an invasive species suppression program in conformance with BLM

Table 5.1-1 *(Continued)*: Statutory Requirements and Projection Measures

Statutory Requirements /Other Resources	Project Effect on Resource	Environmental Protection Measures
	species to the Project area.	requirements to control invasive species in the Project area over the life of the Project.
Native American Religious Concerns		
Native American Religious Concerns	No known conflicts with Native American interests have been identified at this time, but further assessment will be required.	BLM will conduct consultation with Native Americans to determine if there are any concerns.
Prime or Unique Farmlands		
There are no prime or unique farmlands within the Project area.	No prime or unique farmlands will be directly or indirectly affected by the Project.	Not applicable
Threatened and Endangered Species		
Desert Tortoise (*Gopherus agassizii*)	The Project area is located entirely within the Western Mojave Final Environmental Impact Report planning area (BLM 2006). The Project area is not categorized as desert tortoise habitat under California Statewide Tortoise Management Policy (1992). Desert tortoise surveys performed by applicant confirmed that no evidence of a desert tortoise population was located within the Project boundaries. Desert tortoises have been documented near the Opah Ditch mine site, located west of the Project boundaries. The nearest signs of desert tortoise were five desert tortoise burrows, three rock tower shelters, nine desert tortoise scat, and two carcass fragments within the Opah Ditch area, adjacent to the area northwest of the project boundary.	CSM concluded a desert tortoise survey, which found no desert tortoises within the Project site boundaries, although scat was identified west of the north array area. Project staff will be advised of proper protocol if desert tortoises are observed on site. CSM will work with USFWS, CDFG, and BLM to determine if Project development will affect local desert tortoise populations. If effects on desert tortoise are determined, appropriate avoidance and minimization measures shall be developed in consultation with USFWS, CDFG, and BLM and will be implemented by CSM construction and operations personnel.

Table 5.1-1 *(Continued)*: Statutory Requirements and Projection Measures

Statutory Requirements /Other Resources	Project Effect on Resource	Environmental Protection Measures
Potential Listed Plants	No threatened and endangered species were detected within the Project boundaries during surveys performed by CSM.	No measures are proposed to address listed plants because none were found on the project site.
Wastes, Hazardous or Solid		
Hazardous Waste	No hazardous wastes will be used or generated by the Project during normal operations.	Not applicable
Petroleum Hydrocarbon Waste	Nearby fueling stations would be used to the extent feasible to supply Project fueling requirements. During the construction phase, containers of petroleum hydrocarbon fuels may be located in the Project staging area and used during site construction to fuel vehicles. During operations, storage of small quantities of on-site fuels is anticipated for emergency generators.	Bulk fuel containers will be stored in secondary containment to catch any potential fuel spills. Spilled petroleum hydrocarbon wastes will be collected and transported to an off-site disposal facility authorized to accept the wastes.
Solid Waste	Solid wastes will be generated during both the construction and operational phases of the Project.	Solid wastes generated by the Project will be temporarily stored in wind- and wildlife-secure containers on site. Solid wastes generated by the Project will be transported to an off-site disposal facility authorized to accept the wastes.
Sanitary Waste	Sanitary waste will be generated during both construction and operational phases of the Project.	During site construction portable sanitary facilities will be located in the Project area and maintained by a local contractor. During the operational phase of the Project a septic system will be constructed for the Project office/maintenance/storage building(s).

Table 5.1-1 *(Continued)*: Statutory Requirements and Projection Measures

Statutory Requirements /Other Resources	Project Effect on Resource	Environmental Protection Measures
Water Quality (Surface and Ground)		
Surface Water	The Project site is in a desert environment, so there are no surface waters most of the year. There are no perennial surface waters in the Project area.	None
Groundwater	If feasible, groundwater extracted from one or more on-site wells will be used to supply water for washing the solar modules. These wells will be constructed in a manner that preserves groundwater quality and is consistent with San Bernardino County well-drilling requirements.	None
Surface Discharge	Surface discharge will be limited to water from washing the modules, which is not expected to contribute any significant runoff in the area because of the large area over which it will be distributed and the existing arid conditions at the site. During storm events, surface water may be increased due to an increase in impermeable surfaces in the Project area; however, the area of impervious surfaces is not expected to be significant. On-site drainage and detention basins have been designed to capture stormwater runoff.	BMPs will be employed to ensure surface erosion control from any water source (manmade or storm) will be employed to mitigate surface erosion potential.
Wetlands and Riparian Zones		
There no wetlands or riparian zones in or near the Project area.	No wetlands or riparian zones will be directly or indirectly affected by the Project.	Not applicable

Table 5.1-1 *(Continued)*: Statutory Requirements and Projection Measures

Statutory Requirements /Other Resources	Project Effect on Resource	Environmental Protection Measures
Wild and Scenic Rivers		
There are no wild or scenic rivers in or near the Project area.	No wild or scenic rivers will be directly or indirectly affected by the Project.	Not applicable
Wilderness		
There are no wilderness areas or wilderness study areas in the Project area. The Soda Mountains Wilderness Study Area is located less than 1 mile northwest of the Project area.	The Project will have no direct impacts on these wilderness or wilderness study areas, but portions of the Project area will be visible from some elevated locations within the nearby Soda Mountains Wilderness Study Area.	To be determined in the environmental review process.
BLM Other Resources		
Geology and Minerals		
Geologic Hazards	The Project buildings and other facilities will be constructed in a seismically active area.	Facilities will be built in accordance with San Bernardino County and California State Building Code requirements applicable to "Seismic Zone 3." No human-occupied structures will be placed across the trace of a documented active fault., No human-occupied structure will be placed within 50 feet of the trace of an active fault or within a seismic special studies zone without a fault evaluation report, satisfactory to the State Geologist, demonstrating that no undue hazard will be created by the construction or placement of the structure.
Minerals	There are mining claims located both north and west of the Project area. Caltrans has an active claim to extract aggregate on the west side of the	CSM conducted an extensive evaluation of existing ROWs in the Project area (see Corridor Study (RMT2009a) listed in Appendix C). Based on this study, the Project was

Table 5.1-1 *(Continued)*: Statutory Requirements and Projection Measures

Statutory Requirements /Other Resources	Project Effect on Resource	Environmental Protection Measures
	electrical transmission lines, and they plan on expanding this operation. North of the Project area, there are several claims for mining potential minerals and ores. No mining activities occur on these claims.	designed to avoid all known ROWs, including mining claims. No additional measures required.
Soils		
Soils	Soils will be disturbed during site construction and along access ways during normal operations.	See air quality and fugitive dust control measures. Recommendations in technical report (Appendix C).
Vegetation		
Desert Dry Wash Woodland	Desert dry wash woodland does not comprise a significant portion of the Project area. Existing desert dry wash woodland will be removed from the occupied portions of the Project area.	Project facilities will be constructed to avoid major drainages, in part, to reduce impacts to desert wash vegetation.
Desert Scrub Vegetation	Project facilities will be located over much of the desert scrub vegetation in the Project area. Existing desert scrub vegetation will be removed from the occupied portions of the Project area.	Removal of desert scrub vegetation will be restricted to the occupied and fenced portions of the Project area and access roads.
Rare Plants	URS conducted a plant survey of the ROW; Emory's crucifixion thorn, *Castela emoryi*, (CNPS list 2.3) and Utah vine milkweed, *Cynanchum utahense*, (CNPS list 4.3) were the only special-status plant species observed during the 2009 focused plant surveys.	Applicant will discuss mitigation with all applicable regulatory agencies to determine the proper protocols.
Wildlife Resources		
Desert Wash Communities	Major drainages with desert wash woodland	Project facilities will be constructed to avoid major

Table 5.1-1 *(Continued)*: Statutory Requirements and Projection Measures

Statutory Requirements /Other Resources	Project Effect on Resource	Environmental Protection Measures
	wildlife habitat could occur in the Project area.	drainages, in part, to reduce impacts to desert wash communities and to reduce impacts to sensitive wildlife habitat.
Mojave Fringe-toed Lizard	Construction of the Project may cause possible disruption of sand source dynamics in the vicinity of the Project (as described in the MFTL Report—Appendix C).	Appropriate protection measures will be determined during discussions between CSM and the BLM.
Color and Reflection	The Project will introduce new manmade facilities to the viewshed; however, this will be further addressed during the EIS/EIR process.	Where appropriate, a paint color acceptable to the BLM will be used on all Project facilities that can be painted to blend more naturally with the existing setting. Any necessary fencing will be constructed of non-reflective materials or will be treated or painted to reduce visual effects on sensitive viewing areas. The reflectivity of surfaces will be reduced by using non-reflective elements where appropriate and possible.
Lighting	Lights will periodically be used at night in occupied portions of the Project area.	Lighting on the Project site will be dark sky-compliant. Lighting will be limited to areas required for operations or safety, directed on site to avoid backscatter, and shielded from public view to the extent practical. Lighting that is not required during nighttime hours will be controlled with sensors or switches operated such that lighting will be on only when needed.
Profile	The Project's PV blocks will cover an extensive ground area with dark PV panels, which may be visible from very limited residential perspectives. Any such impacts will be evaluated as part of the	The Project area will use low-profile PV panel structures that should not extend higher than 15 feet above ground surface.

Table 5.1-1 *(Continued)*: Statutory Requirements and Projection Measures

Statutory Requirements /Other Resources	Project Effect on Resource	Environmental Protection Measures
	environmental review process.	
Social and Economic Values		
Socioeconomics (During Operations)	During the Project's operational phase, social and economic effects would likely be minimal (RMT 2009b). The Project may employ a handful of maintenance and security workers and have minimal demand on local services. The Project will generate approximately 350 MW of PV electric energy, offsetting the adverse impacts of other energy technology alternatives.	None
Water Quantity		
Construction Water	If available, water from one or more on-site wells will be used to meet water needs during construction (e.g., concrete foundations, equipment pads, and dust control). Otherwise, water will be transported from off site.	None
Operational Water	If feasible, groundwater extracted from one or more on-site wells will be used for washing the solar modules at an estimated rate of 42,000 gallons per day (42 days per year). In addition to the O&M water usage (1,330 gallons per day), during the construction phase an additional 55,000 gallons per day will be used for fugitive dust control. If it is determined that this volume of groundwater use is in conflict with other groundwater uses in the area or is not met by existing groundwater supply, other off-site water supply sources will be used.	None

Table 5.1-1 *(Continued)*: Statutory Requirements and Projection Measures

Statutory Requirements /Other Resources	Project Effect on Resource	Environmental Protection Measures
Lands and Realty		
Lands and Realty	Current BLM policy dictates that proposed solar projects on BLM-administered lands must obtain a ROW.	An application for a ROW to use the Project area for the proposed PV Project and transmission line was submitted to the BLM.
Lands and Realty	Existing ROWs have been issued for other activities and facilities in the Project area, including utilities, transportation, and mining.	The Project will not construct facilities on existing ROWs in the Project area. An evaluation of existing ROWs ensured that the Project would not conflict with current and other proposed projects (see the Corridor Study (RMT 2009a) listed in Appendix C). The Project will, to the extent practical, avoid crossing existing ROWs through the Project area.
Candidate and Special-status Species		
Candidate Species	There are no candidate species known to occur in the Project area.	Not applicable
Special-status Species	The Project would require the semi-permanent disturbance (for the life of the solar facility) of the desert scrub habitat that is currently present at the Project location. These impacts are not expected to be significant considering the current widespread availability of this habitat type.	Mitigation measures will be implemented to protect the special-status plant species found in the Project area. Removal of habitat will be restricted to access roads and occupied portions of the Project area.

site is not located within a DWMA and no tortoises were observed on site; a desert tortoise monitor is not expected to be required.

During normal operations, the facilities will be subject to continuing inspections by O&M staff to ensure sensitive species are protected.

5.1.2 LAND USE DESIGNATIONS

To assess suitability for solar development, the site was evaluated with respect to its location within or its proximity to areas designated as critical habitat areas, DWMAs, and other special management areas. Areas designated as desert tortoise critical habitat, DWMAs, and wilderness areas are associated with additional restrictions on solar energy development. As outlined in Section 5.1.1, no such areas are present within the Project site.

The Soda Mountains Wilderness Study Area (SMWSA) is located west of the Project area. In 1990, BLM published a study[10] evaluating whether the SMWSA should be designated as Wilderness. The study determined that the attributes of the SMWSA were not such as to justify designating the area to be Wilderness.

Immediately southeast of the Project area is the Rasor OHV Recreation Area. A short length of the Project perimeter runs alongside the boundary of this OHV area but no part of the Project site overlaps any portion of the OHV area. Rasor Road, which provides access to the Rasor OHV Recreation Area, will be modified to avoid the Project area; however, access to the OHV Area will be maintained along rerouted Rasor Road from I-15. A portion of rerouted Rasor Road will be established on the edge of the Rasor Road OHV area (Figure 1.3-1).

To the east lies the Mojave National Preserve, which is managed by the National Park Service.

Portions of the site are designated by the BLM as multiple-use class L. Multiple-use class L (Limited Use) protects sensitive, natural, scenic, ecological, and cultural resource values. Public lands designated as class L are managed to provide for generally lower-intensity, carefully controlled multiple use of resources, while ensuring that sensitive values are not significantly diminished (California Desert Conservation Area Plan 1980, as amended). Solar facilities are allowed in class L areas subject to NEPA and planning requirements. Development in this area requires a land use plan amendment, along with an EIS and mitigation of impacts to sensitive, natural, scenic, ecological, and cultural resources.

The Project site lies along a designated federal Section 368 Utility Corridor adjacent to I-15. There are also existing transmission lines running through the area parallel to and adjacent to the western perimeter of the Project area in between the Project site and the SMWSA. I-15 provides a transportation route into the general area of interest; however, roadways throughout the area are limited and include Arrowhead Trail and Zzyzx Road. Arrowhead Trail was replaced by I-15 and is no longer maintained. Zzyzx Road is partially dirt and partially paved. The portion of the ROW that is southeast of I-15 would be accessible by Rasor Road. Rasor Road currently provides access to the Rasor OHV Recreation Area, to the southeast of the Project area. Rasor Road will be re-

[10] *California Statewide Wilderness Study Report,* Part 4, Volume 6, Bureau of Land Management, 1990.

routed to the south of the southern perimeter of the south array area to continue to provide access to the OHV Area. A few unnamed dirt roads also run through the ROW. More access roads will be developed in the area for solar facility installation and maintenance as discussed elsewhere in this plan.

The valley in which the Project is located contains industrial infrastructure: there are already two high-voltage transmission lines, an electrical distribution line, two petroleum product pipelines, a fiber optics cable, and a major interstate highway. Portions of the valley have been designated a federal Section 368 Utility Corridor**.** There currently are proposals for additional ROWs for an additional petroleum pipeline and a railroad.

CSM has undertaken an analysis (Corridor Study; referenced in Appendix C) as to whether the Project is compatible with possible future ROWs that may be developed for utility or transportation purposes in the future. This study demonstrated that Project's use of land in the valley is fully compatible with all such existing, proposed, and reasonably anticipated possible future ROWs.

5.1.3 CULTURAL AND HISTORIC RESOURCES

The following section provides a general description of site characteristics related to archeological issues associated with Project construction and operation and includes a review of previous studies. Reports previously submitted to the BLM have discussed the cultural and paleontological resources at the Project site (referenced in Appendix C).

Initial National Register and CHRIS Review

Prior to conducting the archeological survey of the site, an initial review was undertaken of the National Register of Historic Places and the California Historical Resources Information System (CHRIS) regarding cultural resources at the Project site. The Preliminary Cultural Resource Investigation and Proposed Methodology Memorandum summarized the findings of that review indicates that there are three recorded prehistoric sites and two historic resources (one of which is National Register eligible) within the Project area. In addition, a sacred sites request was undertaken with the Native American Heritage Commission. The results of the records search did not indicate the presence of any sacred sites within the Project area.

Field Survey

Following the CHRIS review, an archeological survey was performed for the entire Project site. This survey followed BLM standards for a Class III Intensive Survey. The area was surveyed for cultural resources and data were recorded using handheld global positioning system units to record precise locations and define site boundaries for identified resources. The archaeological survey determined that there were two sites eligible for the National Register. To preserve these sites, CSM intends to include them within the Project ROW fencing and erect snow fencing around the finds to further protect them from construction activities. The array fields have been designed to minimize the potential for any impact to these sites.

Construction Protocols

Construction will be subject to surveys and clearances required by the National Historic Preservation Act (NHPA) for potential occurrence of cultural or historic resources or sites potentially eligible for inclusion on the National Register of Historic Places.

5.1.4 NATIVE AMERICAN TRIBAL CONCERNS

Pursuant to NEPA, NHPA, or state requirements, Native American consultation has been initiated. BLM is conducting government-to-government Native American consultation.

5.1.5 RECREATION AND OHV CONFLICTS

The Rasor Road exit off I-15 provides access to the Rasor OHV Park. The park, used for off-road recreation, is located on BLM-managed lands south of the Soda Mountain Project site. To maintain public access to the OHV area, Rasor Road will be re-located along the Project site's southern boundary. The project facilities will not be located within the OHV boundary.

The few unnamed dirt roads that also run through the Project site may also be used for casual recreationists. These roads will be closed as required for the installation and security of Project facilities. Closure of any currently open routes will likely limit dispersed recreational opportunities within the area of the solar facility.

5.1.6 OTHER ENVIRONMENTAL CONSIDERATIONS

Air Quality

Operational emissions from the facility are expected to be below the level of significance. Air quality impacts will mainly be related to vehicular emissions and fugitive dust generated during the construction phase. With mitigation measures in place, these impacts will be reduced to the extent feasible. After the facility is operational, regional air quality benefits are anticipated, directly related to a reduction in electrical generation from fossil fuel facilities whose output will be reduced as a consequence of the electrical power generated from the Project.

During construction, increased local particulate matter will result from increased airborne dust. Speed limits of 20 miles per hour will be posted and enforced on site to limit the amount of airborne dust that will result from vehicle travel on dirt roads. Through the environmental review and permitting processes, a site-specific plan for avoiding and/or mitigating airborne dust impacts will be created. Project-specific avoidance and mitigation measures will be incorporated into the final design, EIS/EIR, and Environmental Construction Plan.

Site roads will be brushed or scraped as required to minimize dust and mud deposits, especially at site entrances and any watercourse crossings. If necessary during dry weather, dust suppression may be achieved by spraying water or polymers onto the site roads to reduce airborne dust particulates.

Air emission studies will be completed during the environmental review period to determine if the Project is required to conduct a federal conformity determination. Plans for fugitive dust control will be approved by both the BLM and the MDAQMD.

Visual Impacts

The Project will change the visual landscape of the area from several viewpoints. Potentially sensitive receptors include visitors to the neighboring Rasor OHV Area and travelers on I-15, which runs through the proposed solar field development area. I-15 is not a designated scenic highway.

Through the environmental review process, CSM will work with the BLM and other involved agencies to confirm that the Project meets the Visual Quality Objective set by the BLM that covers the area.

Water Quality and Quantity

Groundwater at the Project site is the property of the State of California. CSM understands that the BLM has no water rights. In California, water rights are use rights and allow the use of the water but do not bestow ownership. Division 2 of Part 5 of the California Water Code, commencing with section 4999 requires water users of more than 25 ac-ft/year to file a notice with the SWRCB. a permit obtained from the Section § 33.06552(a) of the San Bernardino County code requires an application for a discretionary permit to construct, operate, and maintain a new groundwater well. CSM will submit an application for the groundwater wells to the County.

With respect to regulation of ground discharges, the Project site is within the jurisdiction of the LRWQCB, which regulates water recharge.

For solar power generating facilities, water requirements vary significantly depending on the type of solar technology used. For all large solar generating systems located in a desert environment, washing the collectors is required to remove dirt and dust. Over time, these deposits would substantially degrade collector performance, thereby reducing power output. PV technology, as proposed for this Project, does not employ a boiler or a cooling system and, therefore, has no water needs for these purposes. Also, the PV system does not require high-purity water such as would be required for boiler make-up water for solar thermal systems. Water requirements for the Project are detailed in Section 1.3.6.

There are currently no test wells assessing groundwater resources in the area of interest; however, there is a well located at the service station at I-15 and Rasor Road. Another nearby well, which is on land managed by the National Park Service, is in the San Bernardino Meridian Township 13N, Range 8E, Section 1 northeast of the Project site.

Soda Lake is a playa lake formed by water drainage from the surrounding area that quickly evaporates, leaving a dry lakebed. Data from the Section 1 well were collected prior to 1970 and show that groundwater levels were roughly 24 feet bgs in this northern area of Soda Lake. Comprehensive groundwater studies have not yet been conducted in this area. Determination of groundwater quality, quantity, and depth at this remote site would likely require geotechnical investigation. Due to the presence of groundwater nearby at lower elevations (e.g., Soda Lake or community of Baker), groundwater may be present at this site.

Water Body Alterations

To allow the natural wash channels to continue to flow along their natural paths, CSM has designed the array field to avoid the large drainage channels as much as possible. When avoidance is infeasible, water will be collected and diverted to channel the water around facilities. Arrays will be set back from washes to minimize impacts from flooding and erosion.

The erosion control systems proposed for the Project are discussed in detail in Section 1.3.7.

Noise

The Project will comply with applicable federal, state, and County of San Bernardino requirements with respect to noise levels during construction and operation. Through the environmental review and permitting processes, a site-specific plan for avoiding and/or mitigating noise impacts will be created. Project-specific avoidance and mitigation measures will be incorporated into the final design, EIR/EIS, and Environmental Construction Plan.

Operational noise will be primarily limited to a relatively small number of maintenance vehicles. The array fields will not produce any noticeable noise.

Noise levels during the construction phase of this Project will be typical of any large construction Project. There are no residents in the valley within which the Project is located, nor are there any industrial or commercial facilities at which people work (except for the Rasor Road service station and rare maintenance work at the various utility and transportation ROWs within the valley). Because of the remote nature of the site, human noise receptors in the vicinity of the Project will be limited to infrequent visitors to the area, travelers on I-15, and the rare visits by maintenance workers at the aforementioned utility and transportation ROWs. Vehicular traffic on I-15 and the neighboring OHV park currently contributes to background noise levels.

With respect to noise from construction-related traffic, the Project will generate a minor amount of daily trips from the Project area for construction personnel and equipment along Rasor Road approaching the Project site. With respect to noise levels from construction activities, the highest noise typically occurs with earth-moving equipment (e.g., bulldozers, excavators, and backhoes) and road-building equipment (e.g., compactors, scrapers, and graders). Typical operating cycles may involve one or two minutes at full power operation followed by three or four minutes at lower power settings.

Federal codes, primarily OSHA, regulate worker exposure noise levels and will apply during Project construction and maintenance. These codes limit worker exposure to noise levels of 85 decibels (dB) over an 8-hour period. In addition, the State of California regulatory (California Noise Exposure Regulations and Title 8, CCR, Section 5095) action level is an 8-hour time-weighted average of 85 dB. Where noise from Project activities extends beyond BLM property, the Project will also comply with the San Bernardino County Development Code, Section 83.01.080, with respect to noise during construction.

Minerals

There are several mining claims located north of the Project area and one claim directly west of the Project area. No mining activities occur at these claims.

A Caltrans mineral materials site (Opah) is located northwest of I-15. The Caltrans access road runs through the proposed ROW; however, due to the condition of the landscape in this area no solar arrays are planned for this area. The Project ROW also takes into consideration proposed expansion of the Opah materials site. Project development is not expected to affect issues in relation to the minerals site; however, this will be further addressed during the environmental review period.

CSM conducted an extensive evaluation of existing ROWs and mining claims in the Project area (see Corridor Study; Appendix C). Based on this study, the Project was designed to avoid all known mining claims. The Project does not prevent access or interfere with these claims.

Soils and Land Cover

The Project will clear and grade an estimated 2,200 acres of land for installing solar arrays. Areas chosen for development will already be relatively level, which will reduce the potential for water-related soil erosion. The tracker system that will be used with the Project's preferred PV technology choice tolerates some degree of terrain variation, which helps to minimize the degree of grading required.

Revegetation of the developed area with pre-existing native vegetation may not be feasible due to the shading and microclimate caused by solar equipment. BMPs and mitigation measures will be employed during Project development to stabilize soils in the area to the maximum extent feasible and to establish stormwater erosion control methods.

Social and Economic Conditions

The Project is anticipated to have beneficial impacts on the local economy through the use of construction workers from the local labor force and purchase of materials during the 3-year construction phase. Virtually all of the construction workers are expected to come from the local labor force. Construction workers typically commute to work sites from their homes and move from job to job once their particular part of the construction job is finished. Employment, income and earnings, and taxes will be generated from the inter-industry supply chain impacts that result from the direct final demand associated with the Project's purchases of goods and services (i.e., construction, installation, and development spending on materials and PV equipment and other purchases of goods and off-site services). During the O&M phase, local jobs will be generated and the Project's purchase of materials will stimulate economic activity locally as well as throughout California and Nevada.

Construction phase employment is not expected to cause an increase in the local population. During the O&M phase, the Project is not expected to generate a significant number of jobs, or cause a significant increase in the local population. To the extent that these jobs are filled with individuals residing in local communities, or filled by in-migrants who might be expected to reside locally, the impacts will be positive.

Other socioeconomic factors are discussed in the Socioeconomic Analysis submitted to BLM separately (referenced in Appendix C). In particular, this report notes that there will be no disproportionate impacts on any environmental justice populations.

5.2 Mitigation Measures Proposed by Applicant

Environmental protection measures proposed by CSM are listed in Table 5.1-1. The recommendation of technical reports (e.g., geotechnical) will also be followed.

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6: Maps and Drawings

6.1 Facility Design

The maps and drawings in the POD depict the current Project design, based on the 30-Percent Engineering and Civil Design Package. The 30-percent design drawings prepared in 2009, and the remainder of the PV Plant Infrastructure Construction Drawings 30-Percent Submittal plan sheets are included in Appendix B. Revised project drawings in the 30-Percent Submittal Addendum in Appendix B. The revised drawings include:

- Site Layout
- Access Road Details
- Typical Drainage Channel Details
- Fence Details

Maps illustrating Project layout, local access, and the planned interconnect location are included in Section 1.0.

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7: List of Acronyms and Abbreviations

Abbreviation	Definition
AB32	Assembly Bill 32
AC	alternating current
ACOE	U.S. Army Corps of Engineers
ac-ft/yr	acre-feet per year
AMSL	above mean sea level
ARB	California Air Resources Board
bgs	below ground surface
BLM	Bureau of Land Management
BMPs	Best Management Practices
BRTR	Biological Resources Technical Report
CAISO	California Independent System Operator
Caithness	Caithness Development, LLC
Cal/OSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CCWH	Caithness California Wind Holdings, LLC
CDFG	California Department of Fish and Game
CDNPA	California Desert Native Plant Act
CEC	California Energy Commission
CFR	U.S. Code of Federal Regulations
CHRIS	California Historical Resources Information System
CNDDB	California Natural Diversity Database
CPUC	California Public Utilities Commission
CSM	Caithness Soda Mountain, LLC
CWA	Clean Water Act
dB	decibels
DC	direct current

DoD	Department of Defense
DWMA	Desert Wildlife Management Area
DWR	Department of Water Resources
DYA	Diaz-Yourman & Associates
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FERC	Federal Energy Regulatory Commission
GHG	greenhouse gas
gpd	gallons per day
gpm	gallons per minute
I-15	Interstate 15
IOUs	investor-owned utilities
IRP	Integrated Resource Plan
kV	kilovolt
kW	kilowatt
LADWP	Los Angeles Department of Water and Power
LD	light-duty
LEED	Leadership in Energy and Environmental Design
LRWQCB	Lahontan Regional Water Quality Control Board
M-A	Market Place-Adelanto
MDAQMD	Mojave Desert Air Quality Management District
MFTL	Mojave fringe-toed lizard
MM	million (in terms of dollars)
MSDS	Material Safety Data Sheet
MVA	Mega volt amperes
MVAr	Mega volt amperes reactive
MW	megawatt

NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NREL	National Renewable Energy Lab
O&M	operations and maintenance
OHV	off-highway vehicle
OSHA	Occupational Safety and Health Administration
PCBs	polychlorinated biphenyls
PDR	Preliminary Draft Regulation
PG&E	Pacific Gas and Electric Company
PLSS	Public Land Survey System
POD	Plan of Development
PV	photovoltaic
RFP	Request for Proposals
RMT	RMT, Inc.
RPS	Renewable Portfolio Standard
ROW	right-of-way
SBBM	San Bernardino Baseline and Meridian
SCADA	Supervisory Control and Data Acquisition
SCE	Southern California Edison
SCPPA	Southern California Public Power Agency
SDG&E	San Diego Gas and Electric Company
SEGS	Solar Energy Generating System
SHPO	State Historic Preservation Office
SMWSA	Soda Mountains Wilderness Study Area
Solenergis	Solenergis, LLC

SPCCP	Spill Prevention Control and Countermeasure Plan
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TDS	total dissolved solids
TEM	transient electromagnetic
URS	URS Corporation
U.S.	United States
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
V	volts
W	watts
$Wh/m^2/day$	watt-hours per square meter per day
WMP	Weed Management Plan

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