Biological Assessment
Silver State Solar

NVN-085077
(as amended to include NVN-085801)

Prepared for

Bureau of Land Management
Las Vegas Field Office

Prepared by

With technical assistance from

CH2MHILL
2285 Corporate Circle
Suite 200
Henderson, NV 8907

February 19, 2010

Contents

Attachments

Tables

Figures

Acronyms and Abbreviations

°F	degree Fahrenheit
APE	Area of Potential Effect
BA	Biological Assessment
BLM	U.S. Bureau of Land Management
BMP	best management practice
CAISO	California Independent System Operator
CFR	Code of Federal Regulations
CSP	concentrating solar power
CWA	Clean Water Act
DAQEM	Clark County Department of Air Quality and Environmental Management
DCS	distributed control system
DTRPAC	Desert Tortoise Recovery Planning Assessment Committee
DWMA	Desert Wildlife Management Area
ECP	Energy Capital Partners
EIS	Environmental Impact Statement
EITP	Eldorado-Ivanpah Transmission Project
EPRI	Electric Power Research Institute
ESA	Endangered Species Act
FCR	Field Contact Representative
FLPMA	Federal Land Policy and Management Act
kV	kilovolt(s)
kVA	kilovolt-ampere(s)
LVVWD	Las Vegas Valley Water District
MCC	motor control center
mg/m^3	milligram(s) per cubic meter
MSDS	Material Safety Data Sheet

MSHCP	Multiple Species Habitat Conservation Plan
MW	megawatt(s)
NACE	National Association of Corrosion Engineers
NCRS	Natural Resources Conservation Service
NDEP	Nevada Division of Environmental Protection
NEMA	National Electric Manufacturers Association
NEPA	National Environmental Policy Act
NextLight	NextLight Renewable Power, LLC
NFPA	National Fire Protection Association
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
O&M	operation and maintenance
pcf	pound(s) per cubic foot
POD	Plan of Development
PPA	power purchase agreement
psf	pound(s) per square foot
psi	pound(s) per square inch
PV	photovoltaic
ROD	Record of Decision
ROW	right-of-way
SCADA	Supervisory Control and Data Acquisition
SCE	Southern California Edison
SMS	solar meteorological station
SPCC	Spill Prevention, Control, and Countermeasures
SUT	step-up transformer
SWPPP	Stormwater Pollution Prevention Plan
UPRR	Union Pacific Railroad
URTD	upper respiratory tract disease
USACE	U.S. Army Corps of Engineers

USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WEAP	Worker Environmental Awareness Program

SECTION 1

Background

1.1 Introduction

NextLight Renewable Power, LLC (NextLight) proposes to construct, own, and operate the Silver State Solar Project (Project), which will be located in the Ivanpah Valley near Primm, Nevada, in unincorporated Clark County on land administered by the U.S. Bureau of Land Management (BLM) (Figure 1-1). The Project's solar electric generation facilities are designed to meet the increasing demand for clean renewable electrical power. The Project will generate 400 megawatts (MW).

The Project's Right-of-Way (ROW) grant applications comprise a total of 7,925 acres. Facilities and equipment include an operation and maintenance (O&M) facility, access roads, transmission lines, and switchyards(Figure 1-2). Not all of the Project's 7,925 acres will be used for solar energy generation. The footprint for the Project and related facilities is approximately 2,966 acres. Photovoltaic (PV) equipment will not be installed in certain corridors that traverse the Project site, including areas for transmission lines, the 100-year floodplain, prominent drainages (stormwater flow corridors), and areas within the Project boundary too steep to place solar modules.

The Project will help to meet the growing demand for electrical power, while complying with federal policies and Nevada and California mandates for renewable energy generation. The Project will interconnect to the existing NV Energy Bighorn Substation and Southern California Edison's (SCE) Ivanpah-Eldorado transmission line. This will allow both Nevada and California utilities to purchase renewable energy generated by the Project. The Project is well suited to arid environments because PV solar technology converts sunlight directly into electrical energy, entails no thermal process, and requires no process or cooling water to produce electricity. Attachment 1 to this Biological Assessment (BA) includes the complete *Draft Plan of Development, Amendment, Silver State Solar* (POD) (NextLight, 2010), which describes in detail the design, location, and proposed permitting and construction schedule for the Project.

1.2 Purpose of the Biological Assessment

This BA has been prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (ESA) (16 United States Code [USC] 1536(c)) to address potential effects of the proposed Project (Proposed Action) on federally listed threatened and endangered species, their designated critical habitat, and species proposed for or candidates for ESA protection. Specifically, this BA addresses the potential effects associated with the construction, operation, and maintenance of the Proposed Action on the Mojave population of the desert tortoise (*Gopherus agassizii*), a federally threatened species under the ESA. The BLM is the lead federal agency for the Section 7 consultation and will submit this BA to the U.S. Fish and Wildlife Service (USFWS) as part of a request for formal consultation on the desert tortoise. The BLM is also the lead federal agency for National Environmental

Policy Act (NEPA) compliance and an Environmental Impact Statement (EIS) is being prepared concurrent with the ESA Section 7 consultations.

The following summarizes the effects determinations of the Proposed Action.

- Desert tortoise (*Gopherus agassizii*) – May affect and is likely to adversely affect.
- Desert tortoise critical habitat – No effect

No other species protected under the ESA would be affected by the Proposed Action.

1.3 Consultation History

August 21, 2008: Mark Slaughter, Wildlife Biologist, BLM Las Vegas Field Office, at a meeting at BLM's Las Vegas Field Office provided direction to David Watkins, NextLight's contractor, and Douglas Davy, CH2M HILL, on the level of effort and methods that the BLM and USFWS would require for desert tortoise surveys.

October 10, 2008: Mark Slaughter, Wildlife Biologist, BLM Las Vegas Field Office, via telephone conference call that included David Watkins (NextLight), Douglas Davy (CH2M HILL), and Mercy Vaughn (Sundance Biology, Inc.), further discussed the level of effort and methods that the BLM and USFWS would require for desert tortoise surveys. On the basis of this direction, desert tortoise presence or absence surveys were conducted at the Project site using a modified TRED sampling configuration consisting of three 1.5-mile transects per square mile. Calibration transects were not required for these surveys.

August 3, 2009: Robert D. Williams, Field Supervisor of the Nevada USFWS office in Reno, Nevada sent a memorandum (Subject: Scoping comments on the proposed Silver State North and South Solar Projects near Primm in Clark County, Nevada) to the Renewable Energy Project Manager of the BLM Las Vegas Field Office in Las Vegas, Nevada.

December 4, 2009: BLM reviewed the Draft BA and provided comments to NextLight. The comment transmittal from the BLM included a fact sheet on the Desert tortoise and specifications and a drawing for tortoise proof fencing. These documents are in Attachment 3 of this BA.

December 18, 2009: BLM (Mark Slaughter; Jayson Barangan, Greg Helseth, Mark Chandler); USFWS (Brain Novosak, Fish and Wildlife Biologist, Nevada Fish and Wildlife Office), NextLight (Bill Chilson), and CH2M HILL (Christine Roberts and Mark Cochran) met in BLM's Las Vegas Field Office to discuss the BLM's December 4, 2009, comments on the Draft BA. At the meeting, the BLM and USFWS stated that USFWS Desert Tortoise Recovery Office is preparing guidance for the project proponents to use when developing Desert Tortoise relocation/translocation plans and that the guidance was anticipated to be available in early January 2010. The BLM provided NextLight

with a summary document ("Desert Tortoise Translocation—Preliminary Discussions, no date) that outlined the types of measures the guidance would include. CH2M HILL coordinated via email and telephone with the BLM in early January to assess the status of the guidance. As of the preparation of this BA, the guidance is still pending release. Upon receipt of the guidance, NextLight will prepare a Desert Tortoise Relocation/Translocation Plan.

February 8, 2010: BLM (Mark Slaughter; Jayson Barangan); USFWS (Brain Novosak, Fish and Wildlife Biologist, Nevada Fish and Wildlife Office), NextLight (Bill Chilson), and CH2M HILL (Mark Cochran) met in BLM's Las Vegas Field Office to discuss the BLM's December 18, 2009, comments on the Draft BA. At the meeting, the BLM and USFWS stated that the BLM will provide NextLight with the Draft USFWS Desert Tortoise Recovery Office guidance for developing the Silver State project's Desert Tortoise relocation/translocation plan.

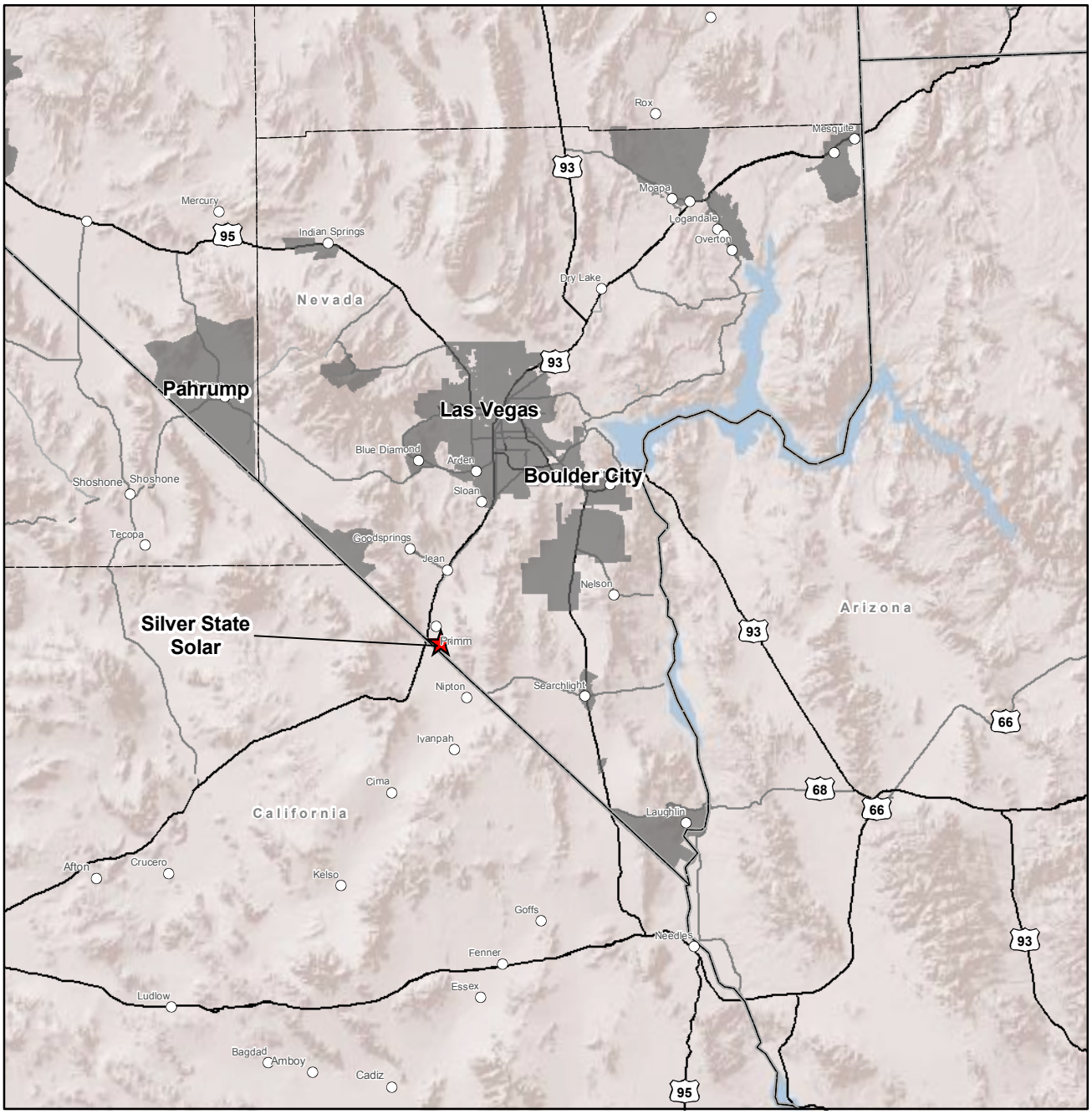
1.4 Document Organization

This BA is organized into the following sections:

- Section 1, Background
- Section 2, Description of the Proposed Action
- Section 3, Project Construction, Site Stabilization, and Operations and Maintenance
- Section 4, Minimization Measures
- Section 5, Affected Environment
- Section 6, Status of Species and Habitat
- Section 7, Effects of the Proposed Action
- Section 8, References

The following attachments are included in this BA:

- Attachment 1, Silver State Solar Draft Plan of Development, Amendment (NextLight, 2010).
- Attachment 2, Desert Tortoise Survey Report
- Attachment 3, Recommended Specifications for Desert Tortoise Exclusion Fencing

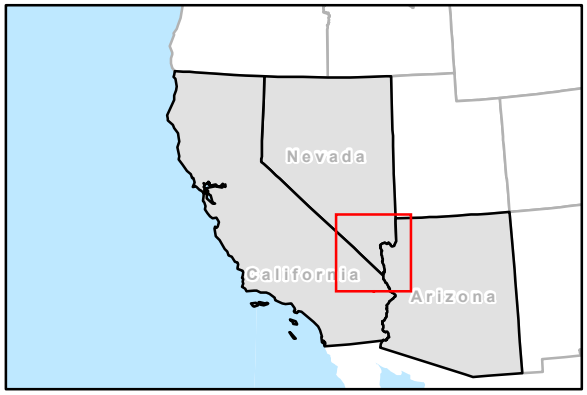


LEGEND

- Project Site
- City/Town
- Freeway
- Major Roads
- County Boundary
- Urban Areas

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

VICINITY MAP

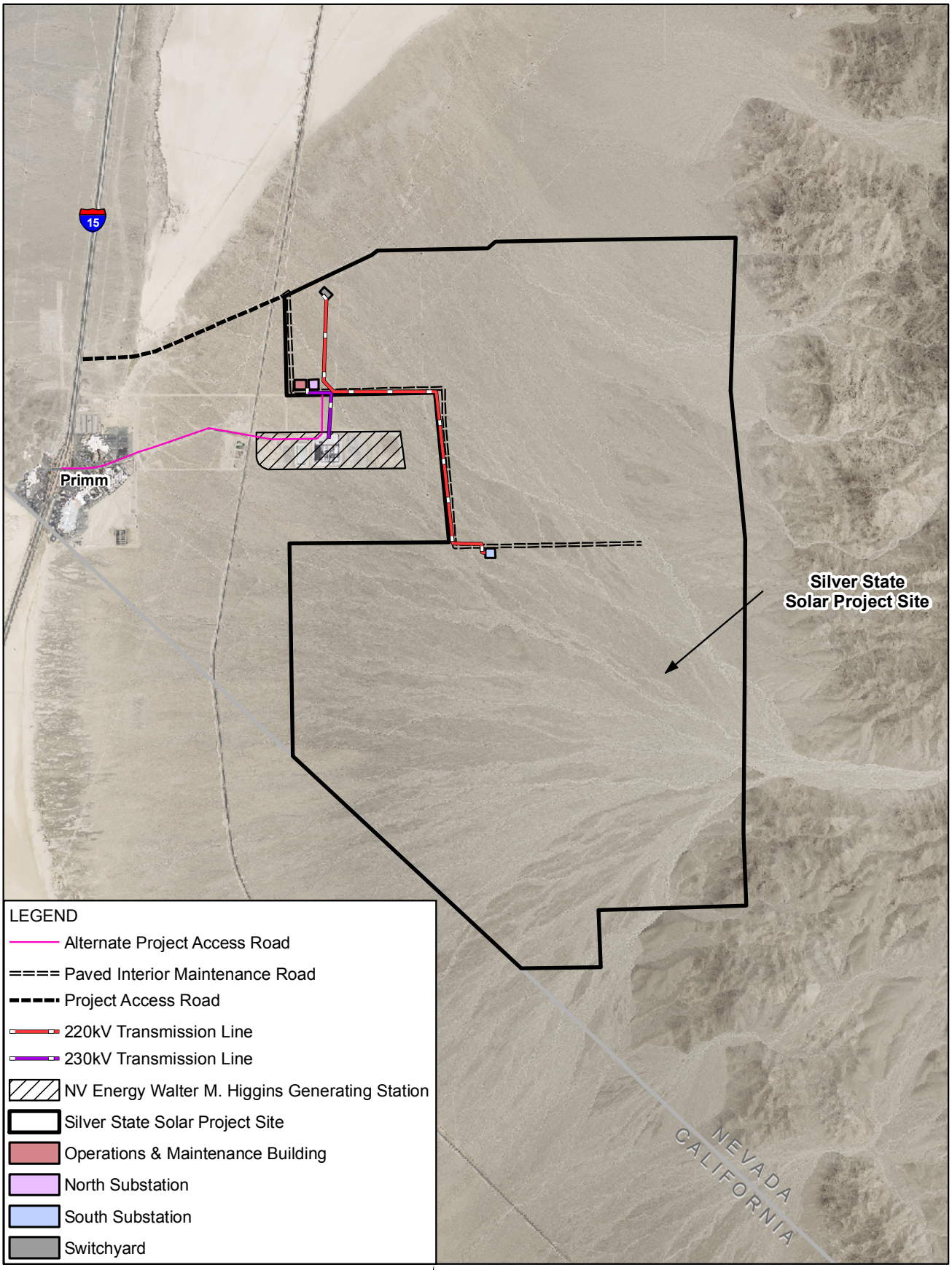


N

0 12.5 25

Miles

FIGURE 1-1
PROJECT VICINITY
SILVER STATE SOLAR
CLARK COUNTY, NEVADA



This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

FIGURE 1-2
PROJECT LOCATION
SILVER STATE SOLAR
CLARK COUNTY, NEVADA

CH2MHILL

\\ELVIS\GIS\PROJECTS\NEXTLIGHT\400598_SILVERSTATETO14\MAPFILES\FIG1_2_PROJECTLOCATIONSSS_POD_RV.MXD KBROCK 1/14/2010 09:15:23

SECTION 2

Description of the Proposed Action

2.1 Introduction

This section describes the features of the proposed Silver State Solar PV Project in the Ivanpah Valley near Primm in Clark County, Nevada, and summarizes the purpose and need. The Project will be constructed in phases and interconnected to each electric utility separately based on the scheduled availability of the transmission interconnections. (Section 3 discusses the phased construction and the operations and maintenance of the Project. Attachment 1 to this BA includes the complete *Draft Plan of Development, Amendment, Silver State Solar* (POD) (NextLight, 2010), which describes in detail the design, location, and proposed permitting and construction schedule for the Project, and this BA references the POD, as relevant, throughout this section.

As noted in Section 1.1 of this BA, not all of the Project's 7,925 acres will be used for solar energy generation. The footprint for the Project and related facilities is approximately 2,966 acres. PV equipment will not be installed in certain corridors that traverse the Project site, including areas for transmission lines, the 100-year floodplain, prominent drainages (stormwater flow corridors), and areas within the Project boundary that are too steep for placing solar modules.

2.2 General Facility Description, Design, and Operation

2.2.1 Project Location, Land Ownership, and Jurisdiction

The Project site is located in an unincorporated portion of Clark County, approximately 40 miles south of Las Vegas and 2 miles due east of Primm (see Figures 1-1 and 1-2). Although the Project boundary would encompass approximately 7,925 acres of federal lands managed by the BLM, the Project components would occupy only approximately 2,966 acres. The Project is proposed for T27S, R59E, Sections 1, 2, 3, 11, 12, 13, 14, 15, 22, 23, 24, N 1/2 25, 26, 27, Mount Diablo Base and Meridian (USGS State Pass, Roach and Desert 7.5-minute quadrangles). The site is bounded by the NV Energy Walter M. Higgins Generating Station and the Union Pacific Railroad (UPRR) to the west, the California state line to the southwest, the Lucy Gray Mountains to the east, and a major electric transmission line corridor to the north and west (see Figure 1-2).

NextLight filed Form SF-299 ROW grant applications with the BLM Las Vegas Field Office in March and August of 2008 for use of BLM administered lands for solar power development. The first application was assigned project serial number NVN 085077. The second Form SF-299 ROW grant application, filed in August 2008 (amended in September 2008 to incorporate additional land), was assigned BLM serial number NVN-085801. The lands defined in these applications are adjacent and contiguous, and encompass a total approximately 7,925 acres. Pursuant to the Request for Amendment of Right-of-Way Application following the POD Amendment, NextLight has filed a request to amend the

ROW application NVN-085077 to include the land identified in NVN-085801, and that BLM case number NVN-085801 be closed. NextLight will also pursue other federal, state, and local permits that may be necessary in parallel with the NEPA review process and in coordination with BLM. Appendix C of Attachment 1 contains a list of laws and regulations applicable to the project, grouped by discipline.

2.2.2 Legal Land Description

The Project site is located in T27S, R59E, Mount Diablo Base and Meridian. The legal description, township/range, and section for the entire Project, is shown in Table 2-1. Section lines are shown in Figure 2-1 and the facility layout is shown in Figure 2-2. All of the lands proposed for use are federal lands.

TABLE 2-1
Township/Range and Section Information

Facility	Township/Range	Section
Project footprint (area enclosed by perimeter fence)	27S 59E	2, 3, 11, 14, 15, 22, 23, 26, 27
Project Access Road (County road; I-15 frontage to facility gate)[a]	27S 59E	3, 4
230kV transmission line (North Substation to Bighorn Substation)	27S 59E	3, 10
Bighorn Substation Expansion[b]	27S 59E	10
220kV transmission line (South Substation to switchyard)	27S 59E	3, 11, 14
34.5kV collection lines	27S 59E	2, 3, 11, 14, 22, 23
O&M area	27S 59E	3
North substation	27S 59E	3
South substation	27S 59E	14
Switchyard	27S 59E	3
Internal access:		
Maintenance Road	27S 59E	2, 3, 11, 13, 14
Perimeter Road	27S 59E	2, 3, 11, 14, 15, 22, 23, 26, 27
Solar field access ways	27S 59E	2, 3, 11, 14, 15, 22, 23, 26, 27
Solar field (PV equipment, inverters, transformers)	27S 59E	2, 3, 11, 14, 15, 22, 23, 26, 27
Drainage controls	27S 59E	2, 11, 14
Firebreak	27S 59E	2, 3, 11, 14, 15, 22, 23, 26, 27
Service Road	27S 59E	1, 2, 12
Alternate Project Access Road	27S 59E	10

Related Facilities: The following components are described and evaluated as part of the Project:

[a]Project Access Road from I-15 frontage road to Project site entrance will be permitted and approved by Clark County and will be a public road.

[b]NV Energy's Bighorn Substation will be expanded to accommodate additional equipment required to interconnect the Project.

2.2.3 Total Acreage and General Dimensions of All Facilities and Components

Table 2-2 lists the Project's facilities and components and the associated acreages and general dimensions. Not all of the Project's 7,925 acres will be used for solar energy generation. The footprint for the Project and related facilities is approximately 2,966 acres. PV equipment will not be installed in certain corridors that traverse the Project site, including areas for transmission lines, the 100-year floodplain, prominent drainages (stormwater flow corridors), and areas within the Project boundary that are too steep for placing solar modules. Figure 2-2 shows the site layout. More detail of the site layout is shown in the following figures:

- Figure 2-2a. Roads and Access Ways
- Figure 2-2b. Fencing
- Figure 2-2c. Drainage Controls
- Figure 2-2d. Transmission Lines

Construction of these features, including desert tortoise fencing is discussed in Section 3 of this BA.

TABLE 2-2
Project Facilities, Acreage, and Dimensions

Facility	Acreage	Length	Width
Facilities Within Perimeter Fence[a]			
230kV Transmission Line[b] (North Substation to Bighorn Substation)	1.0	0.15 mi	—
220kV Transmission Line (South Substation to switchyard)	16.3	2.5 mi	—
34.5kV Collection Lines	31.5	variable	Variable
O&M Area	3.6	350 ft	450 ft
North Substation	2.8	350 ft	350ft
South Substation	2.8	350 ft	350ft
Internal Access:			
Maintenance Road	12.5	3.43 mi	30 ft
Perimeter Road	41.0	13.45 mi	25 ft
Solar field access ways	84.7	34.9 mi	20 ft
Solar field	2575	—	—
Undeveloped Area[c]	93.8	—	—
Total	**2,865**		
Facilities Outside Perimeter Fence			
230kV Transmission Lined (North Substation to Bighorn Substation)	1.8	0.30 mi	—
34.5kV Collection Lines	4.1	0.8 mi	Variable
Switchyard	2.6	460 ft	240 ft
Drainage Control Berms[e]	17.7	3.95 mi	Varies
Drainage Control Berm Temporary Construction Area[f]	11.0	3.95 mi	Varies

TABLE 2-2
Project Facilities, Acreage, and Dimensions

Facility		Acreage	Length	Width
Firebreak		33.1	13.65 mi	20 ft
Extension of Maintenance Road		1.5	0.42 mi	30 ft
Construction Worker Parking (Temporary)		3.8	550 ft	300 ft
Service Road		8.27	4.54 mi	15 ft
Alternate Project Access Road[g]		1.1	0.3 mi	30 ft
	Total	**84.97**		
Project Facilities	**Total Area**	**2,949.97**		
Related Facilities				
Project Access Road (County road from I-15 frontage to facility)[h]		7.5	1.55 mi	40 ft
Bighorn Substation Expansion (NV Energy)		10.0	450 ft	950 ft
Related Facilities	**Approximate Total Area**	**17.5**		
Project Facilities and Related	**Approximate Total Area**	**2,966**		

[a]The entire area within the perimeter fence is assumed to be disturbed.
[b]Portion of 230kV transmission line within perimeter fence.
[c]Area within perimeter fence not occupied by equipment, but assumed to be disturbed.
[d]Portion of 230kV transmission line outside perimeter fence.
[e]Area occupied by drainage control berms.
[f]Additional area anticipated to be disturbed during construction of drainage control berms.
[g] Although the preferred access road is the County Road, this alternate access road is included in the project acreage because it would be built by NextLight for project access if the County did not proceed with construction of the County road.
[h]Project Access Road will be permitted and improved by Clark County and will be a county road.

2.2.4 Project Components

The Project will include the following main components, which are listed here and described in the sections noted in parentheses):

- Solar Array and Equipment (Section 2.2.4.1)
- Inverters and Transformers (Section 2.2.4.2)
- Substations (Section 2.2.4.3)
- Transmission Line and Switchyard (Section 2.2.4.4)
- Operations and Maintenance Area (Section 2.2.4.5)

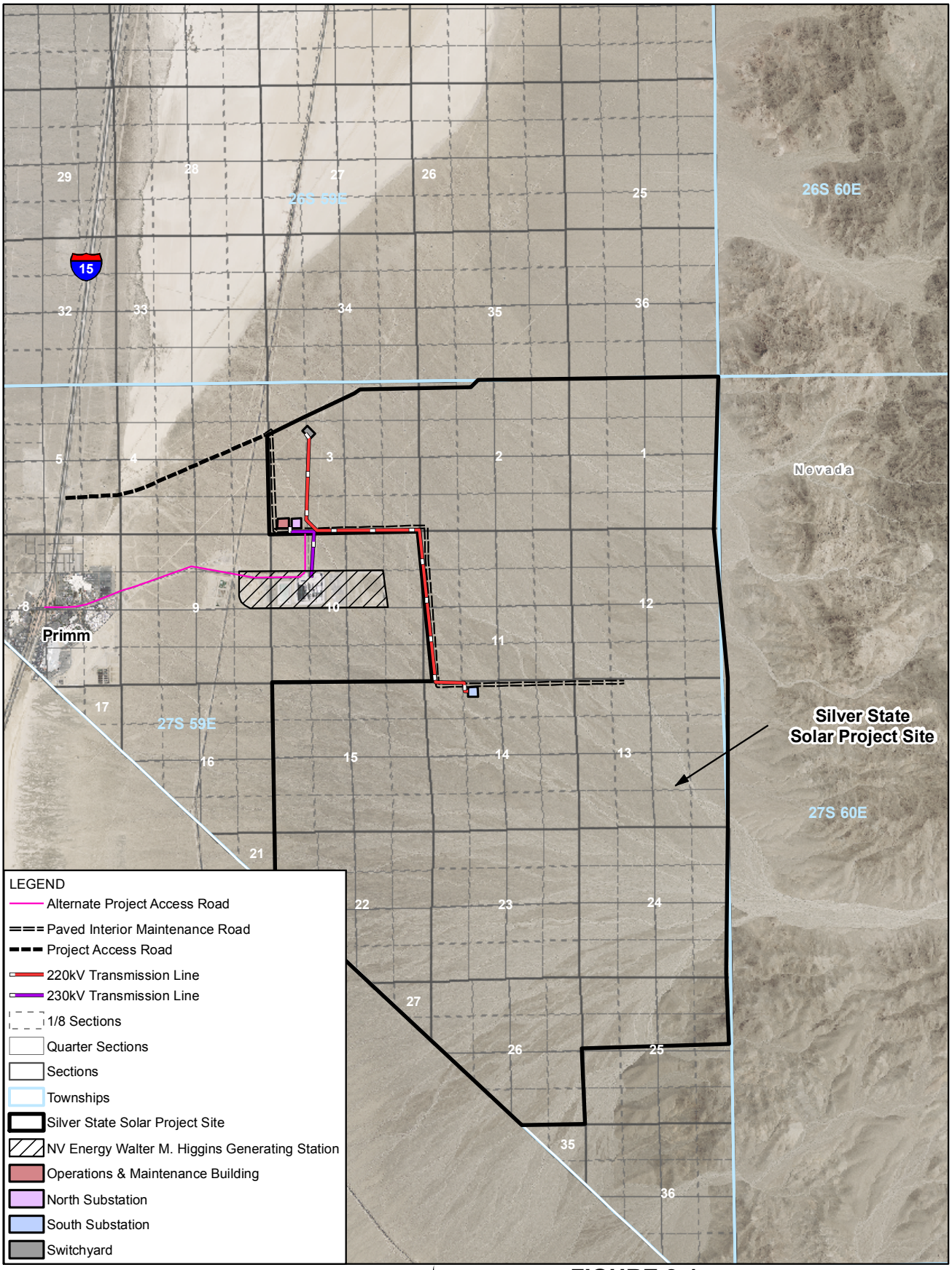
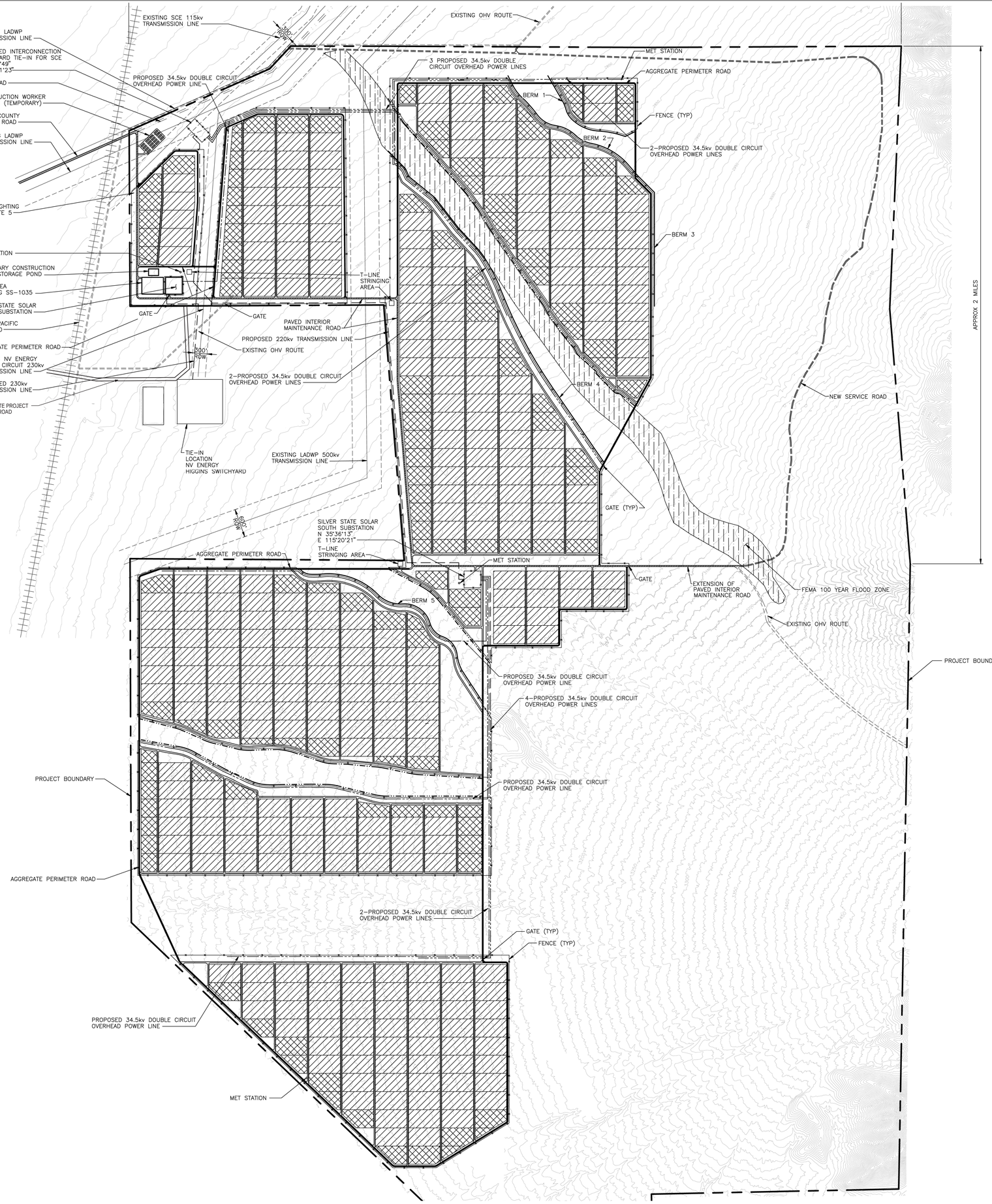


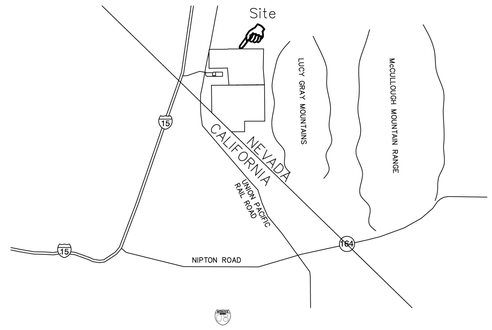
FIGURE 2-1
TOWNSHIP/RANGE, SECTION, AND SUBDIVISION INFORMATION
SILVER STATE SOLAR
CLARK COUNTY, NEVADA

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

CH2MHILL

\\ELVIS\GIS\PROJECTS\NEXTLIGHT\400598_SILVERSTATETO14\MAPFILES\FIG1_3_LEGALDESCRIPTIONSS_POD_RV.MXD KBROCK 1/14/2010 09:28:24





VICINITY MAP
NO SCALE

ABBREVATIONS

SCE = SOUTHERN CALIFORNIA EDISON

LADWP = LOS ANGELES DEPARTMENT OF WATER AND POWER

MET STATION = METOROLOGICAL MONITORING STAION, 10' TALL

LEGEND

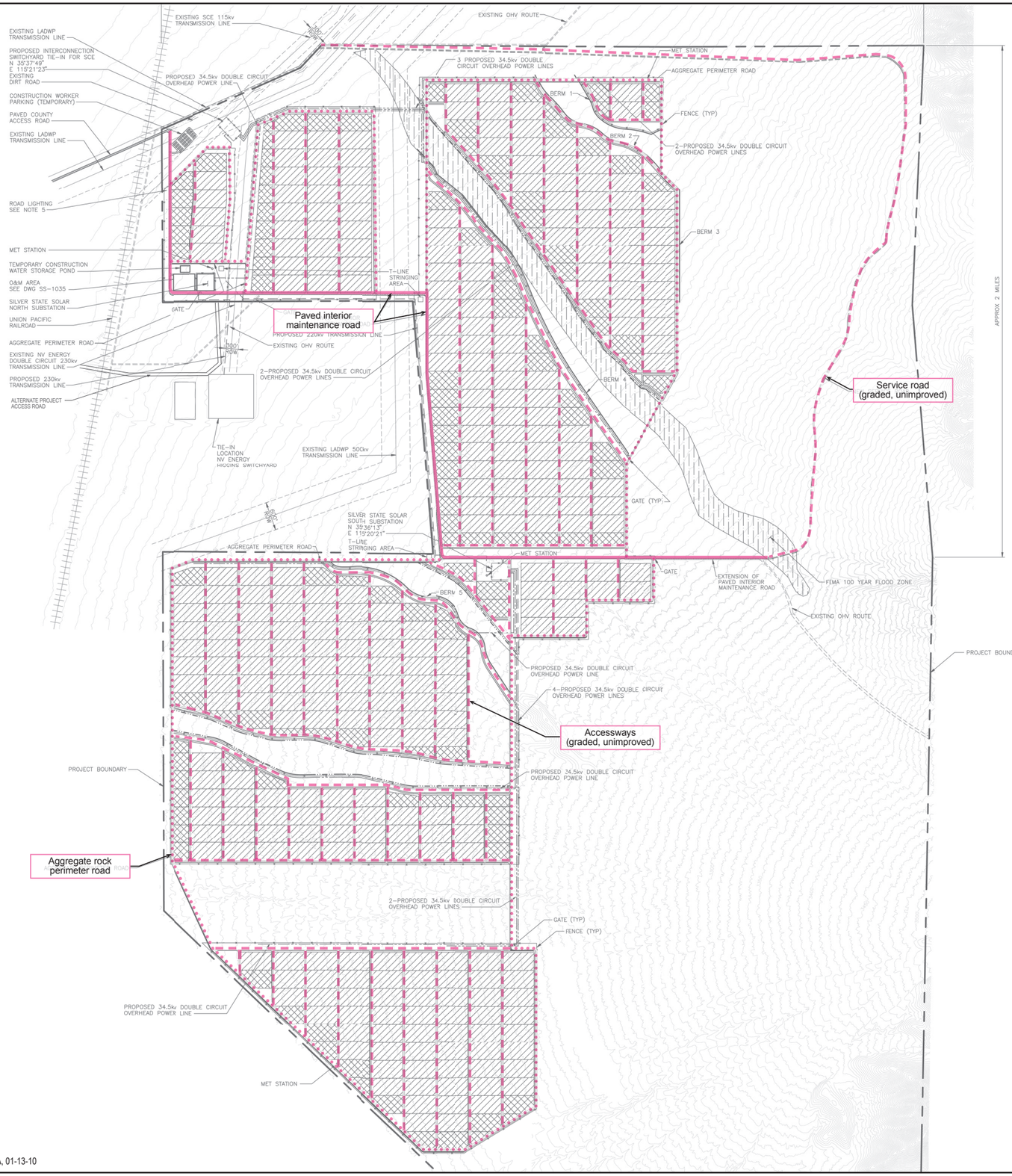
- DESIGNATES FULL BLOCK OF PV PANELS PER DWGS 164562-SS-1034B TO 1034D
- DESIGNATES PARTIAL BLOCK OF PV PANELS WITH SAME ROW AND PANEL SPACING, BUT FOR A PARTIAL AREA.
- PAVED INTERIOR MAINTENANCE ROAD
- AGGREGATE PERIMETER ROAD
- INTERIOR SERVICE ACCESWAYS (GRADED COMPACTED DIRT)
- NEW SERVICE ROAD (GRADED, UNIMPROVED)
- LIMITS OF WASH WITH BERM
- LIMITS OF WASH

NOTES

1. ALL 34.5 KV OVERHEAD POWER LINES ARE SPACED 30' CENTER TO CENTER ON 45' TALL POLES SPACED 150' ON CENTER.
2. CONTOURS SHOWN AT 10' INTERVALS.
3. ALL ROADS ARE PROPOSED/NEW UNLESS NOTED OTHERWISE.
4. PROPOSED SUBSTATIONS AND INTERCONNECTION SWITCH YARD ARE INDIVIDUALLY ENCLOSED WITH FENCING SEPARATE FROM OVERALL PROJECT BOUNDARY FENCING.
5. ROAD LIGHTING TO BE SPACED AT APPROXIMATELY 200'-0" INTERVALS.

FIGURE 2-2
Site Layout
Silver State Solar
Clark County, Nevada

Source: Black & Veatch, Corp., Drawing 164562-SS-1034A, 01-13-10



VICINITY MAP
NO SCALE

ABBREVATIONS

SCE = SOUTHERN CALIFORNIA EDISON
LADWP = LOS ANGELES DEPARTMENT OF WATER AND POWER
MET STATION = METOROLOGICAL MONITORING STAION, 10' TALL

LEGEND

- DESIGNATES FULL BLOCK OF PV PANELS PER DWGS 164562-SS-1034B TO 1034D
- DESIGNATES PARTIAL BLOCK OF PV PANELS WITH SAME ROW AND PANEL SPACING, BUT FOR A PARTIAL AREA.
- PAVED INTERIOR MAINTENANCE ROAD
- AGGREGATE PERIMETER ROAD
- INTERIOR SERVICE ACCESWAYS (GRADED COMPACTED DIRT)
- NEW SERVICE ROAD (GRADED, UNIMPROVED)
- LIMITS OF WASH WITH BERM
- LIMITS OF WASH

NOTES

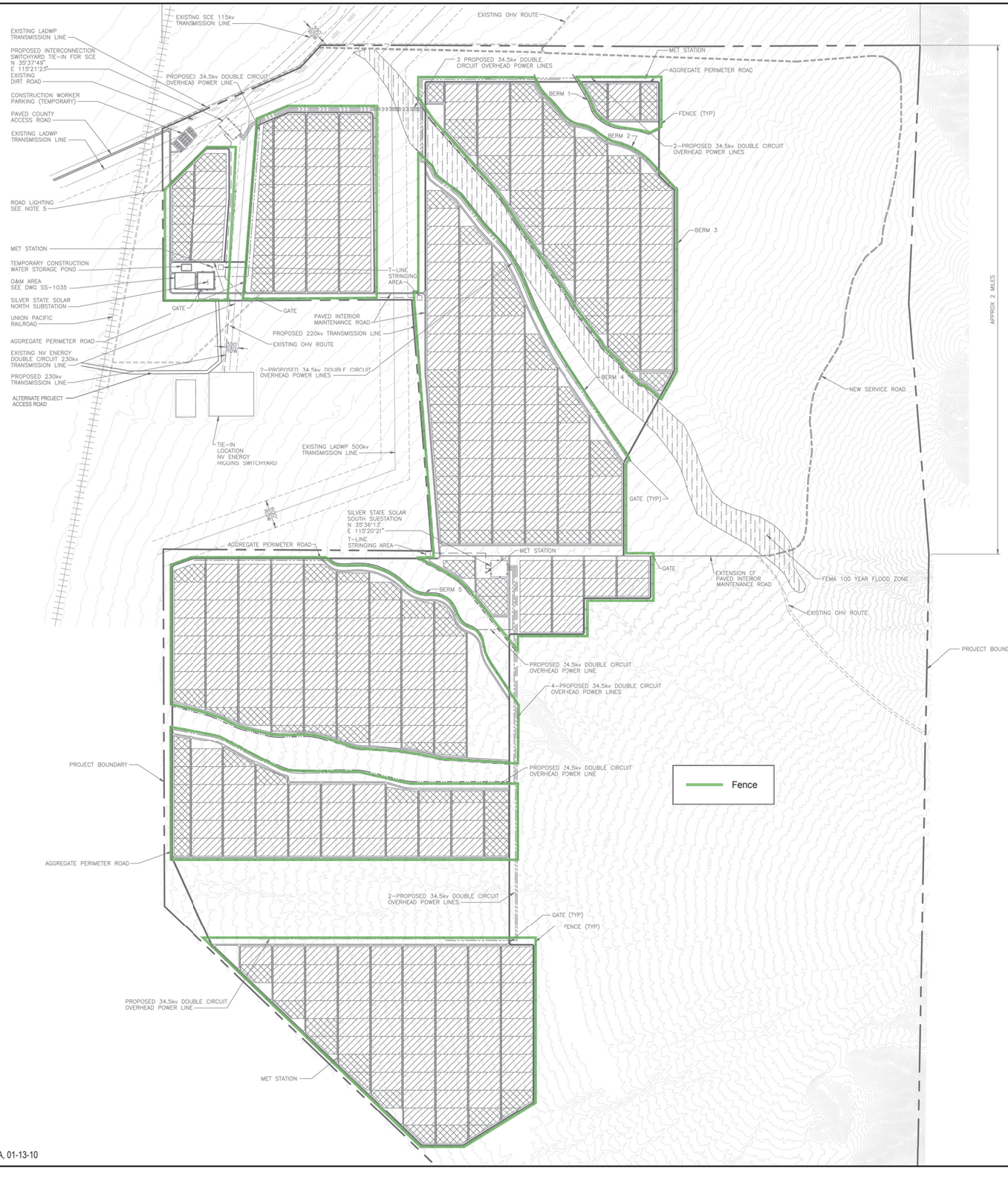
1. ALL 34.5 KV OVERHEAD POWER LINES ARE SPACED 30' CENTER TO CENTER ON 45' TALL POLES SPACED 150' ON CENTER.
2. CONTOURS SHOWN AT 10' INTERVALS.
3. ALL ROADS ARE PROPOSED/NEW UNLESS NOTED OTHERWISE.
4. PROPOSED SUBSTATIONS AND INTERCONNECTION SWITCH YARD ARE INDIVIDUALLY ENCLOSED WITH FENCING SEPARATE FROM OVERALL PROJECT BOUNDARY FENCING.
5. ROAD LIGHTING TO BE SPACED AT APPROXIMATELY 200'-0" INTERVALS.

NOT TO BE USED FOR CONSTRUCTION

800 0 800 1600
APPROXIMATE SCALE IN FEET

FIGURE 2-2a
Site Layout, Roads and Accessways
Silver State Solar
Clark County, Nevada

Source: Black & Veatch, Corp., Drawing 164562-SS-1034A, 01-13-10



VICINITY MAP
NO SCALE

ABBREVATIONS

SCE = SOUTHERN CALIFORNIA EDISON

LADWP = LOS ANGELES DEPARTMENT OF WATER AND POWER

MET STATION = METOROLOGICAL MONITORING STAION, 10' TALL

LEGEND

- DESIGNATES FULL BLOCK OF PV PANELS PER DWGS 164562-SS-1034B TO 1034D
- DESIGNATES PARTIAL BLOCK OF PV PANELS WITH SAME ROW AND PANEL SPACING, BUT FOR A PARTIAL AREA.
- PAVED INTERIOR MAINTENANCE ROAD
- AGGREGATE PERIMETER ROAD
- INTERIOR SERVICE ACCESWAYS (GRADED COMPACTED DIRT)
- NEW SERVICE ROAD (GRADED, UNIMPROVED)
- LIMITS OF WASH WITH BERM
- LIMITS OF WASH

NOTES

1. ALL 34.5 KV OVERHEAD POWER LINES ARE SPACED 30' CENTER TO CENTER ON 45' TALL POLES SPACED 150' ON CENTER.
2. CONTOURS SHOWN AT 10' INTERVALS.
3. ALL ROADS ARE PROPOSED/NEW UNLESS NOTED OTHERWISE.
4. PROPOSED SUBSTATIONS AND INTERCONNECTION SWITCH YARD ARE INDIVIDUALLY ENCLOSED WITH FENCING SEPARATE FROM OVERALL PROJECT BOUNDARY FENCING.
5. ROAD LIGHTING TO BE SPACED AT APPROXIMATELY 200'-0" INTERVALS.

NOT TO BE USED FOR CONSTRUCTION

THE DISTRIBUTION AND USE OF THE NATIVE FILE FORMAT OF THIS DRAWING OUTSIDE OF BLACK & VEATCH IS UNCONTROLLED AND SHALL BE USED FOR REFERENCE PURPOSES ONLY.

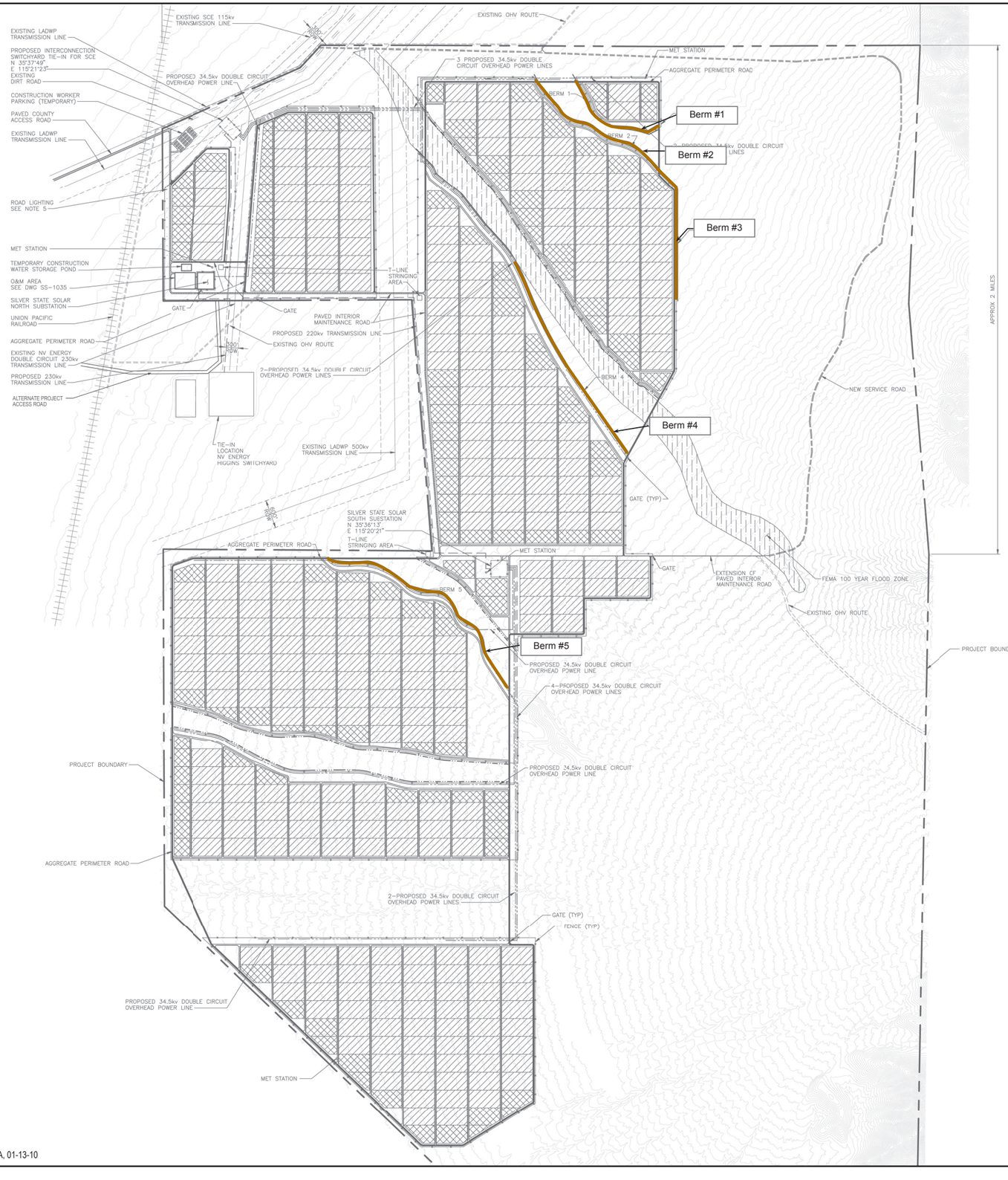
N

800 0 800 1600

APPROXIMATE SCALE IN FEET

FIGURE 2-2b
Site Layout, Fencing
Silver State Solar
Clark County, Nevada

Source: Black & Veatch, Corp., Drawing 164562-SS-1034A, 01-13-10



ABBREVATIONS

SCE = SOUTHERN CALIFORNIA EDISON

LADWP = LOS ANGELES DEPARTMENT OF WATER AND POWER

MET STATION = METOROLOGICAL MONITORING STAION, 10' TALL

LEGEND

DESIGNATES "ULL BLOCK OF PV PANELS PER DWGS 164562-SS-1034B TO 1034D

DESIGNATES "ARTIAL BLOCK OF PV PANELS WITH SAME ROW AND PANEL SPACING, BUT FOR A PARTIAL AREA.

PAVED INTERIOR MAINTENANCE ROAD

AGGREGATE PERIMETER ROAD

INTERIOR SERVICE ACCESWAYS (GRADED COMPACTED DIRT)

NEW SERVICE ROAD (GRADED, UNIMPROVED)

LIMITS OF WASH WITH BERM

LIMITS OF WASH

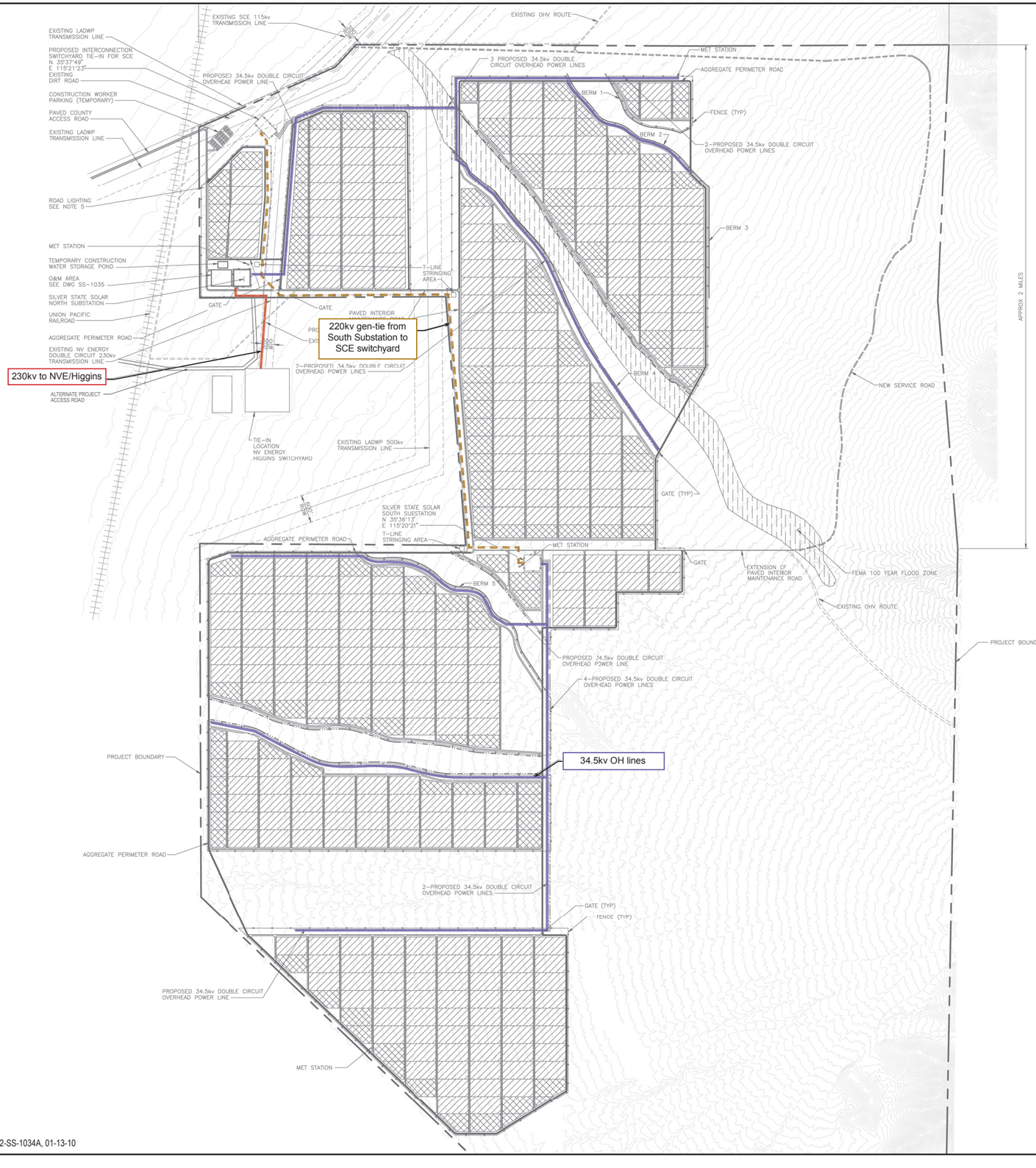
NOTES

1. ALL 34.5 KV OVERHEAD POWER LINES ARE SPACED 30' CENTER TO CENTER ON 45' TALL POLES SPACED 150' ON CENTER.
2. CONTOURS SHOWN AT 10' INTERVALS.
3. ALL ROADS ARE PROPOSED/NEW UNLESS NOTED OTHERWISE.
4. PROPOSED SUBSTATIONS AND INTERCONNECTION SWITCH YARD ARE INDIVIDUALLY ENCLOSED WITH FENCING SEPARATE FROM OVERALL PROJECT BOUNDARY FENCING.
5. ROAD LIGHTING TO BE SPACED AT APPROXIMATELY 200'-0" INTERVALS.

NOT TO BE USED FOR CONSTRUCTION

FIGURE 2-2c
Site Layout, Drainage Controls
Silver State Solar
Clark County, Nevada

Source: Black & Veatch, Corp., Drawing 164562-SS-1034A, 01-13-10



ABBREVATIONS

SCE = SOUTHERN CALIFORNIA EDISON

LADWP = LOS ANGELES DEPARTMENT OF WATER AND POWER

MET STATION = METOROLOGICAL MONITORING STAION, 10' TALL

LEGEND

DESIGNATES FULL BLOCK OF PV PANELS PER DWGS 164562-SS-1034B TO 1034D

DESIGNATES PARTIAL BLOCK OF PV PANELS WITH SAME ROW AND PANEL SPACING, BUT FOR A PARTIAL AREA.

PAVED INTEROR MAINTENANCE ROAD

AGGREGATE PERIMETER ROAD

INTERIOR SERVICE ACCESWAYS (GRADED COMPACTED DIRT)

NEW SERVICE ROAD (GRADED, UNIMPROVED)

LIMITS OF WASH WITH BERM

LIMITS OF WASH

NOTES

1. ALL 34.5 KV OVERHEAD POWER LINES ARE SPACED 30' CENTER TO CENTER ON 45' TALL POLES SPACED 150' ON CENTER.
2. CONTOURS SHOWN AT 10' INTERVALS.
3. ALL ROADS ARE PROPOSED/NEW UNLESS NOTED OTHERWISE.
4. PROPOSED SUBSTATIONS AND INTERCONNECTION SWITCH YARD ARE INDIVIDUALLY ENCLOSED WITH FENCING SEPARATE FROM OVERALL PROJECT BOUNDARY FENCING.
5. ROAD LIGHTING TO BE SPACED AT APPROXIMATELY 200'-0" INTERVALS.

N

800 0 800 1600

APPROXIMATE SCALE IN FEET

FIGURE 2-2d
Site Layout, Transmission Lines
Silver State Solar
Clark County, Nevada

Source: Black & Veatch, Corp., Drawing 164562-SS-1034A, 01-13-10

- Roads (Section 2.2.4.6)
- Erosion Control and Stormwater Drainage (Section 2.2.4.7)
- Firebreak (Section 2.2.4.8)

Related facilities will include expanding NV Energy's Bighorn Substation to accommodate additional equipment required to interconnect the Project. In addition, the Proposed Project Access Road will be constructed and permitted by Clark County.

2.2.4.1 Solar Array and Other Equipment

The Project will use crystalline silicon or thin film PV technology mounted on either single-axis trackers or fixed-tilt structures. The tracking technology described in this BA (Section 2.3.5) and the POD (Section 1.3.5 of Attachment 1) is based on that of SunPower (tilted tracker) and BP Solar (horizontal tracker) systems and associated equipment. Actual equipment will be similar to this technology, and will be selected based on cost and market availability of the equipment.

Design options that could be selected relate primarily to foundation design and whether the solar modules are mounted on fixed panels or on tracking systems that will allow the modules to track the location of the sun from sunrise to sunset. NextLight is considering three primary design options, including: (1) tilted trackers, (2) horizontal (non-tilted) trackers, and (3) fixed tilt non-tracking systems, discussed below.

On tilted trackers, the PV modules are mounted to be south-facing and tilted at 15-20 degrees from horizontal. PV modules on the horizontal trackers are mounted horizontal (not tilted to the south). The tracking units are arranged into east to west rows for tilted trackers, or north to south-oriented rows for horizontal trackers, and are powered by a drive motor to track the east-west path of the sun on a single axis throughout the day. The tracking systems will use concrete ballasts or embedded pier foundations to support the trackers. Fixed tilt panels are constructed in a similar arrangement into east to west rows and use similar foundations. The fixed tilt panels are positioned to receive optimal solar energy, but the panels do not track the path of the sun. Table 2-3 summarizes this information, and Attachment 1 contains a detailed description of the PV design options.

TABLE 2-3
PV Technology General Comparison

	Single Axis		
	Tilted Tracker	**Horizontal Tracker**	**Fixed Panel**
Mounting Direction	South-facing	Horizontal	South-facing
Degrees from Horizontal (ground surface)	15-20°	0°	20-25°
Arrangement of Rows	East to West	North to South	East to West
Drive motor	Yes	Yes	No
Tracks Movement of Sun	Yes	Yes	No
Foundation	Concrete ballasts or embedded pier foundations	Concrete ballasts or embedded pier foundations	Concrete ballasts or embedded pier foundations

The solar field and support facilities perimeter will be secured with chain link metal-fabric security fencing. Controlled access gates will be located at the site entrance. Access gates will also be located at specific locations along the Perimeter Road to allow maintenance and security crew access to all portions of the project site. The location of the perimeter fence and access gates is shown on Figures 2-2 and Figure 2-2b. The perimeter fence will be an 8-foot-high chain link fence with barbed-wire security strands at the top. Tortoise-proof half-inch hardware cloth metal mesh will be installed against the lower two feet of the chain link fence and will extend an additional one foot below the ground. Below ground this tortoise fencing will be angled outward, away from the solar collector field, to discourage burrowing tortoises. The tortoise-proof fencing is intended to prevent federally listed desert tortoises from entering the solar field, where Project-related activities could harm them. The construction sequencing of the Project is discussed in more detail in Section 3 of this BA.

Security at the Project site will be achieved by fencing, lighting, and security patrols. The Project site will be staffed 24 hours per day, seven days per week. This staff will include full time security, and regular security patrols will be conducted throughout the site. Lighting will be provided at the O&M building, and Project Access Road entrance. See Attachment 1 for additional information on the Project lighting system. An unlighted perimeter security system may also be installed as necessary.

2.2.4.2 Inverters and Transformers

The Project inverters and transformers, as well as other electrical equipment, will be located within protective electrical equipment enclosures supported by concrete pads (see Attachment 1, POD Figures 1-5, 1-7, and 1-9, for locations). Each enclosure will be approximately 15 feet wide, 60 feet long, 10 to 12 feet in height, and will house two inverters and one transformer to support each 1MW block (for a Project total of 800 inverters and 400 transformers). Inverter and transformer specifics are provided below; these may vary pending final Project design:

- Inverters
  - Dimensions: 3.5 feet width by 12 feet length by 8 feet height
  - Capacity: 500 kilowatts (kW)
- Transformers
  - Dimensions: 10 feet width by 10 feet length by 8 feet height
  - Capacity: 1,000 kilovolt-amperes (kVA)
  - Oil: Each transformer contains approximately 315 gallons of dielectric oil

2.2.4.3 Substations

Each Project substation area (approximately 350 feet by 350 feet each), and the switchyard area will include an uninhabited control house, medium and high voltage switchgear and conductor structures, and two 50-percent-rated transformers (each approximately 30 feet wide by 15 feet long by 15 feet high).

Each transformer contains approximately 8,700 gallons of dielectric fluid (mineral oil), and will be located on a concrete pad approximately 30 feet long by 15 feet wide, surrounded by a 6-inch earthen or concrete containment berm/curb approximately 50 feet long by 30 feet wide. The containment area will be lined with an impermeable membrane covered with

gravel, and will drain to an underground storage tank. Any stormwater or fluid drained to the tank will be inspected for a sheen prior to disposal. If a sheen is observed, the tank contents will be removed by vacuum truck and disposed at an approved disposal site. If no sheen or contaminants are detected, the stormwater will be drained on-site. The above containment/storage tank/holding pond system will be designed to accommodate the volume of the dielectric fluid in the transformer plus an allowance for precipitation.

2.2.4.4 Interconnection to the Electrical Grid/Transmission Line and Switchyard

The Project will be capable of delivering renewable energy into both the Nevada market, via NV Energy's Bighorn Substation, and the California market, via SCE's proposed 220kV upgraded EITP transmission line. Connection to the Nevada market is made via a new 0.45-mile, 230kV transmission line running from the north substation in Section 3 to the 230kV bus at the existing Bighorn Substation. The Bighorn Substation will be expanded to accommodate the additional equipment required to interconnect the Project.

Connection to the CAISO is made by a tap into the 220kV EITP transmission line. A new 2.5-mile, 220kV transmission line (gen-tie) will connect the South substation to the switchyard. The switchyard will include a 34.5kV to 220kV SUT for step-up of the northern half of the Project PV equipment. The switchyard will contain 220kV circuit breakers and bus-work to combine the output of the north portion of the Project with the 220kV transmission line from the South substation and interconnect to SCE's EITP transmission line. The 220kV/230kV transmission gen-tie lines will be single circuit and supported on galvanized or color treated steel monopole towers. Although final transmission line design has not been completed, an estimated combined total of 22 steel monopole towers are likely to be required for construction of the 220kV/230kV lines.

2.2.4.5 Operations and Maintenance Area

The Project will include an operation and maintenance area consisting of a permanent O&M building approximately 100 feet by 200 feet, with a height of approximately 27.5 feet, that will house administrative, operation, and maintenance equipment and personnel. The location of the O&M area is shown on Figure 2-2 and the general layout of the O&M area is provided in Figure 2-3.

2.2.4.6 Roads

Project-related roads are the access roads, perimeter road, maintenance road, solar field access ways, and service road, as summarized in Table 2-4. These roads are described below and shown in Figures 2-2 and 2-2a. During construction, a stabilized entrance/exit will be provided to clean vehicle wheels prior to exiting the construction area. Similar to the disturbance that would occur from other project components (based on the assumption that all acreage within the fenced perimeter will be disturbed), the acreage identified for roads also is considered to be permanent disturbance. (Table 2-2 identifies the area of disturbance for each road as a subset of the total disturbed area within the perimeter fence.)

TABLE 2-4
Project and Project-related Roads

Road	Status	Surface
Project-related		
Project Access Road – County Road (2477)	Existing	Paved
Alternate Project Access Road	Existing and New	Paved
Project		
Perimeter Road	New	Aggregate Rock
Maintenance Road	New	Paved
Solar Field Access Ways	New	Compacted Earth
Service Road	New	Unimproved Graded

Access Road. Access to the Project site will be via the Project Access Road, a new 1.55-mile-long, 40-foot-wide road constructed and maintained (including necessary lights and crossing gates at the UPRR crossing) by Clark County as a public road. The road will be constructed on the alignment of the existing RS2477 road from the I-15 frontage road to the Project site. The County will convert the RS2477 to a County road. If the proposed Project Access Road described above is not constructed, Project site access will be via an Alternate Project Access Road that would be constructed by NextLight on private property and BLM-administered lands. The Alternate Project Access Road will extend from the existing Primm Boulevard to the Project site and use the existing UPRR overpass that currently provides access to the NV Energy Walter M. Higgins Generating Station. The new 0.3-mile-long, 30-foot-wide road will be prepared with an aggregate rock base and paved. The Alternate Project Access Road is subject to obtaining private agreements for use of the existing road and overpass. The Alternate Project Access Road will be constructed only if the Project Access Road is not developed by Clark County.

Perimeter Road. A new gravel (aggregate rock) Perimeter Road will be located just inside of the site's perimeter fence and will be constructed to allow access by maintenance and security personnel. This road will be approximately 13.4 miles long and 25 feet wide. The use of aggregate rock for the Perimeter Road will facilitate access through the site for non-four-wheel-drive vehicles and minimize dust that could be associated with use of vehicles for monitoring and security needs.

Maintenance Road. A new interior Maintenance Road will be constructed within the fenced area of the site to provide access to the O&M building. The road will be a paved road that begins where the new Project Access Road ends (at the Project site boundary). This road will be approximately 3.85 miles long and 30 feet wide. From the project site entrance, the road will proceed in a southerly direction to the O&M building. The road will continue east along the southern boundary of Section 3, will then turn due south to run along the western boundary of Section 11, and then will turn east to its termination in Section 13.

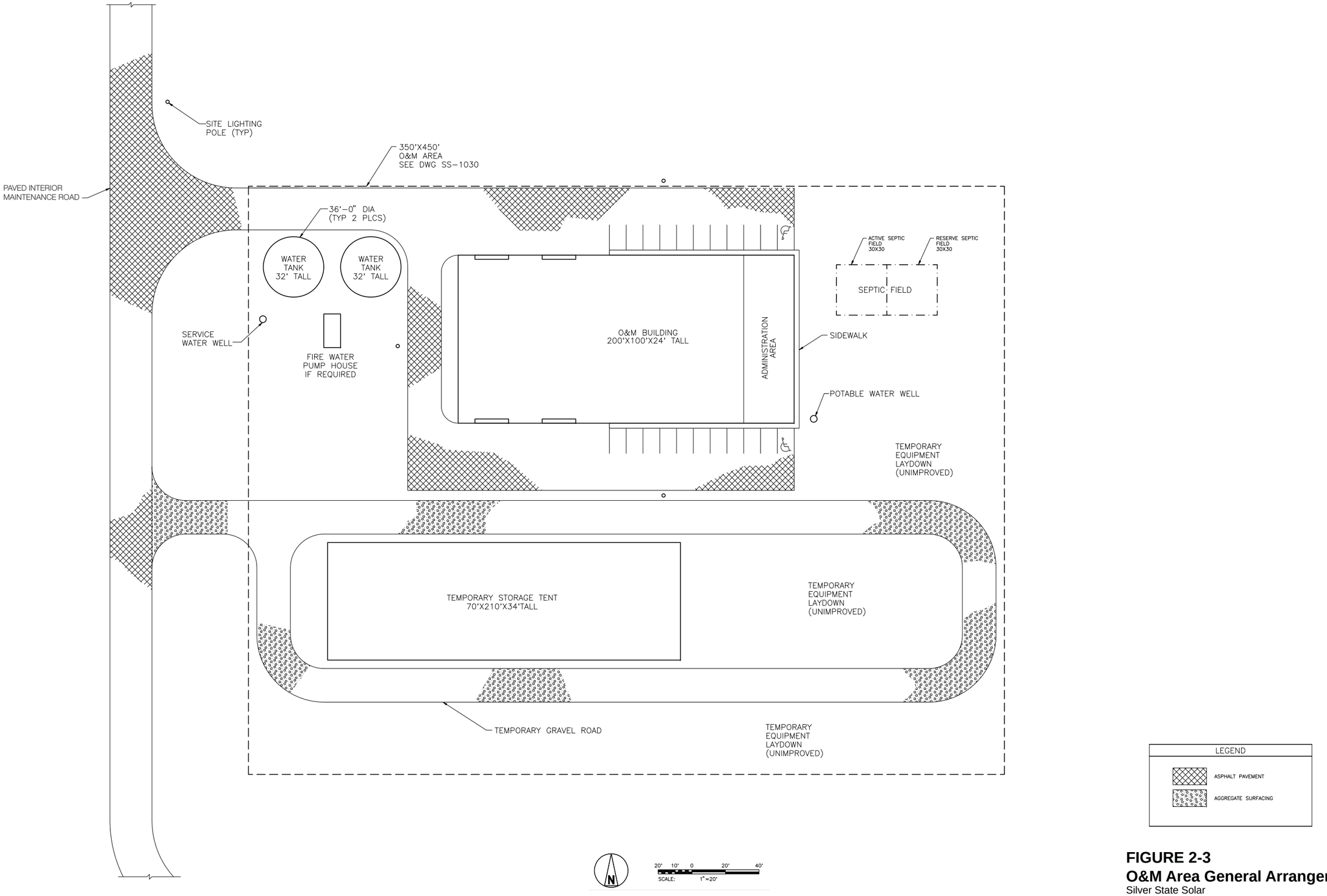


FIGURE 2-3
O&M Area General Arrangement
Silver State Solar
Clark County, Nevada

Source: Black & Veatch, Corp., Drawing 164562-SS-1035, 10/22/09

Solar Field Access Ways. Within the solar field, new access ways will be built to provide vehicle access to the solar equipment (PV modules, inverters, transformers) for operation and maintenance activities during dry conditions. These access ways will comprise approximately 34.9 miles and be approximately 20 feet wide. The access ways will be approximately every 700 feet across the solar field. The existing surface area will be graded and compacted using onsite materials to facilitate use by two-wheel-drive vehicles.

Service Road. An 8.27-mile-long and 15-foot-wide Service Road will be constructed outside the perimeter fence, as illustrated in Figure 2-2, to provide secondary access to the site. It will extend along the northern boundary of the Project site, across the northern edge of Section 1 and then south along the eastern Project boundary (in sections 1 and 12) where it will connect to the existing trail that provides access to the Lucy Gray Mountains. The new road will be graded to accommodate four-wheel-drive vehicles.

2.2.4.7 Erosion Control and Stormwater Drainage

Conceptual Drainage Study. In the interim since NextLight submitted the November 2009 version of the POD, the drainage design has been revised based on a conceptual drainage study (Silver State Photovoltaic Power Project, Conceptual Drainage Report, Louis Berger Group, January 14, 2010) The revised drainage design eliminates the previously proposed construction of upstream drainage control features, which results in a substantial reduction in ground disturbance compared with the November 2009 drainage design. The conceptual drainage study modeled the stormwater flows and conducted site surveys to assess historical flow patterns. Appendix A of Attachment 1 contains the drainage study.

Drainage Control Design. The majority of the site will be drained by sheet flow to onsite and offsite drainages. The drainage study identified four existing natural washes through the Project that receive the majority of the storm water flow originating upstream of the Project site. In contrast with the prior conceptual drainage plan, the revised drainage plan will use the existing natural washes, by reinforcing their banks, and allow the remaining stormwater flow to pass through the site naturally. These four existing natural washes are referred to in the POD and its supporting design drawings as "stormwater flow corridors." The revised drainage design will incorporate small, wide drainage control berms. The drainage control features in the revised drainage plan will consist of (1) stormwater flow corridor reinforcement berms along select existing natural washes that traverse the Project site in a generally east-west direction, and (2) a drainage control berm on the eastern exterior of the solar array. The berms will be constructed to a height of 3-to-5 feet above grade with a top width of approximately 15 feet. All the berms will be constructed outside the perimeter fence. Table 2-2 presents the acreage associated with the berms. Figure 2-4 shows a conceptual design of the berms. Berm construction is discussed in Section 3 of this BA.

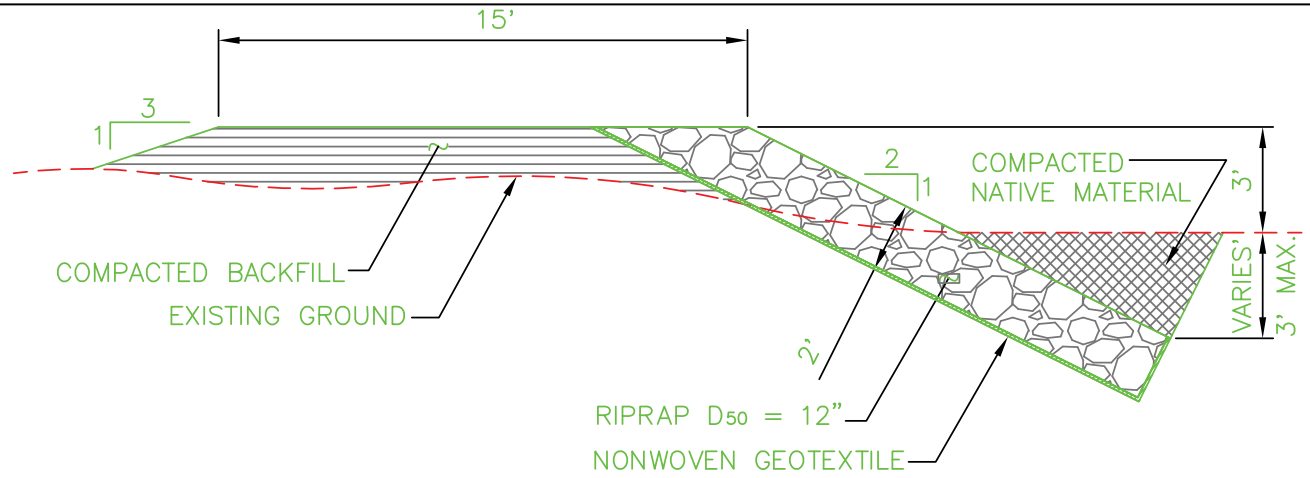
2.2.4.8 Firebreak

A 20-foot-wide firebreak will be constructed on the exterior of the Perimeter Fence. Shrubs and other large vegetation will be removed from the firebreak. The firebreak will be maintained by occasional grading or discing.

Fencing during construction will consist of portable stand-alone chain link fence modules or plastic snow fencing supported by standard metal fencepost. Tortoise fencing will be installed prior to construction along the boundaries of the construction zone to clearly mark

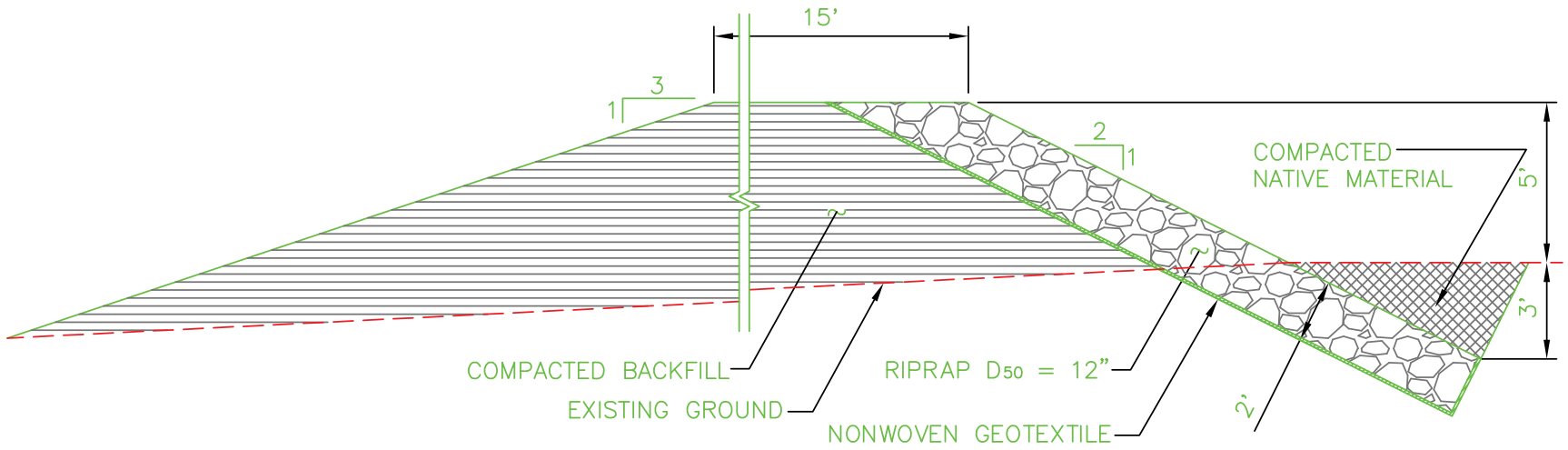
this zone, preventing vehicles or personnel from straying onto adjacent offsite habitat. Fencing will also be installed around the North and South substations, and the switchyard. Access gates will be provided to allow maintenance vehicle access to the equipment. Substation and switchyard fencing will be similar in design to the perimeter fence.

The Project's fire protection water system will be supplied from two water storage tanks located near the O&M building, holding a minimum of 3 hours of full flow runtime (approximately 270,000 gallons) to be accessible through a Clark County-approved fire hydrant.



TYPICAL INTERIOR BERM SECTION

(NTS)



TYPICAL BOUNDARY BERM SECTION

(NTS)

FIGURE 2-4
Conceptual Berm Design
Silver State Solar
Clark County, Nevada

Source: Black & Veatch, Corp., Drawing CB1087_TY-001.dwg, Jan. 2010

SECTION 3

Project Construction, Site Stabilization, and Operations and Maintenance

This section presents the construction of the Project, site stabilization and reclamation activities and operations and maintenance.

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

Construction of the Project, from site preparation and grading to commercial operation, is expected to take place from the fourth quarter of 2010 to the fourth quarter of 2014. Construction will include the major phases of mobilization, construction grading and site preparation, installation of drainage and erosion controls, PV panel/tracker assembly, and solar field construction.

3.1.1 Design, Layout, and Installation

Detailed construction design will take place during the final phase of project permitting. Drainage design, for example, will be based on a detailed topographic map developed using the light detection and ranging (LIDAR) remote sensing technology. The LIDAR survey will be tied to an established grid coordinate system for accuracy. Licensed professional surveyors will conduct the final project boundary surveys and will stake out the project site design layout before construction.

3.1.2 Major Construction Process Milestones

Major construction process milestones are listed in Table 3-1. This schedule is conceptual and subject to change, including potential acceleration, depending on market conditions within the regional power markets and availability of necessary infrastructure improvements to allow the power to be delivered from the site to the energy markets.

TABLE 3-1
Project Construction Schedule Major Milestones

Activity	Date
NEPA Record of Decision	4th Quarter 2010
Begin Construction	4th Quarter 2010
First PV modules placed into commercial operation	2nd Quarter 2011
Full Commercial Operation of all PV modules	4th Quarter 2014

3.1.3 Construction Process Timetable and Sequence

The Project will be constructed sequentially in distinct phases and interconnected to each electric utility separately based on the scheduled availability of the transmission interconnections.

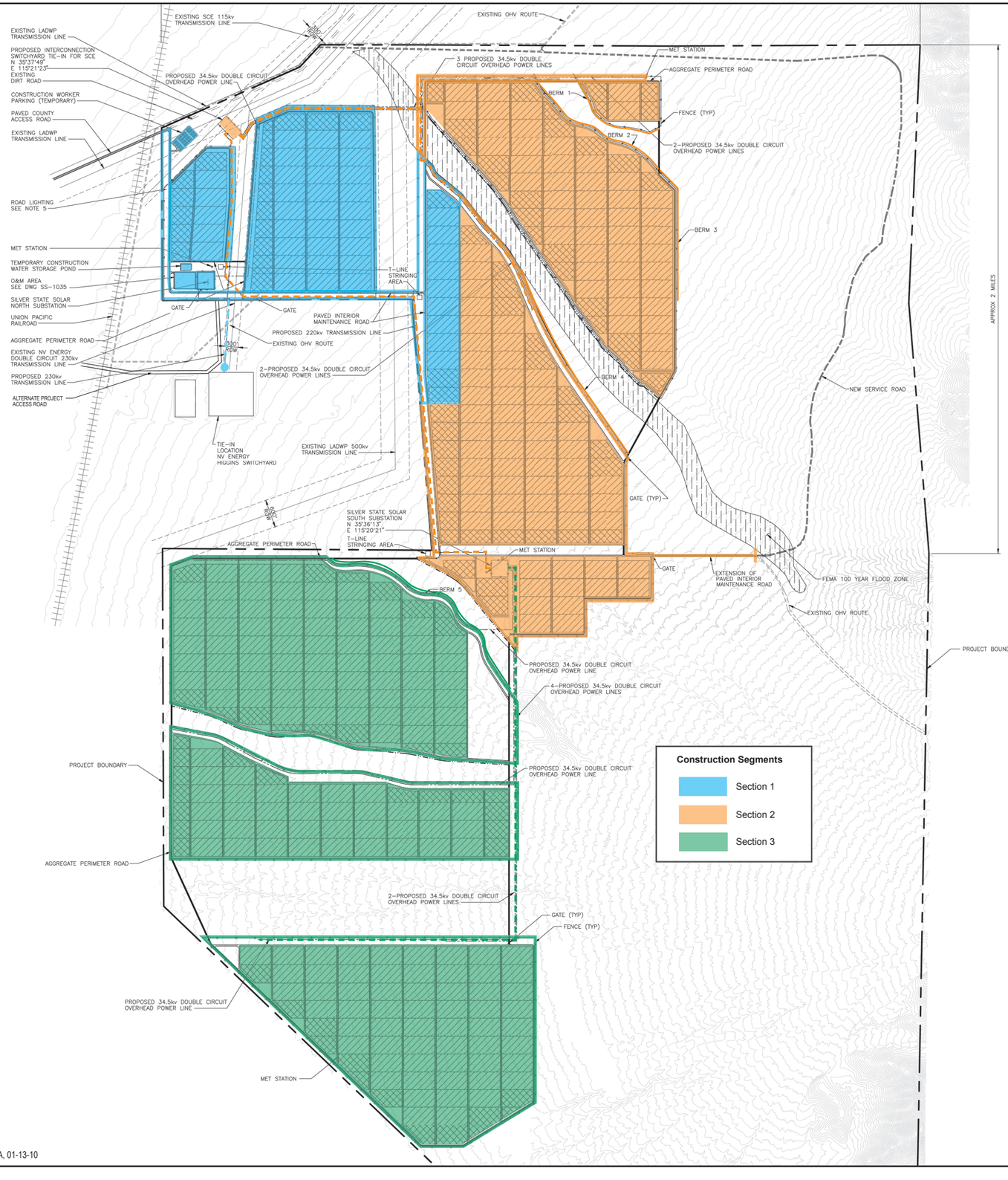
Interconnection to the Nevada market via the NV Energy Bighorn Substation will require expansion of the substation. It is not anticipated that the NV Energy substation improvements will constrain the project development schedule.

Interconnection to the California market will require completion of the SCE EITP to provide the infrastructure and capacity adequate to deliver power from the project to the California market. Current plans are for the EITP to be available in the third quarter of 2013.

The construction schedule (see Table 3-2) is designed to accommodate the availability of transmission to these two markets. The construction schedule may require modification to satisfy obligations under each power purchase agreement (PPA), or to accommodate any changes in the scheduled interconnection availability. Under either of these scenarios, the general approach and the task sequence will remain the same (e.g., environmental clearance first (including construction of Desert tortoise fencing) followed by site access and site preparation), but may occur on a different timeframe.

The sequencing (or phasing) of construction of the Project is illustrated by:

- Figure 3-1, which shows the three separate construction phases and indicates the facilities to be constructed in each phase.
- Figures 3-2 through 3-4, which provide section-by-section details of the facilities constructed within each phase
- Table 3-2, which provides a high-level schedule for construction of the entire Project area and is color-coded to match Figures 3-1 through 3-4.
- Table 3-3, which summarizes the construction activities that will occur in each phase.
- Table 3-4, which summarizes the surface area affected during each phase.



VICINITY MAP
NO SCALE

ABBREVIATIONS

SCE = SOUTHERN CALIFORNIA EDISON
LADWP = LOS ANGELES DEPARTMENT OF WATER AND POWER
MET STATION = METOROLOGICAL MONITORING STAION, 10' TALL

LEGEND

- DESIGNATES FULL BLOCK OF PV PANELS PER DWGS 164562-SS-1034B TO 1034D
- DESIGNATES PARTIAL BLOCK OF PV PANELS WITH SAME ROW AND PANEL SPACING, BUT FOR A PARTIAL AREA.
- PAVED INTERIOR MAINTENANCE ROAD
- AGGREGATE PERIMETER ROAD
- INTERIOR SERVICE ACCESWAYS (GRADED COMPACTED DIRT)
- NEW SERVICE ROAD (GRADED, UNIMPROVED)
- LIMITS OF WASH WITH BERM
- LIMITS OF WASH

NOTES

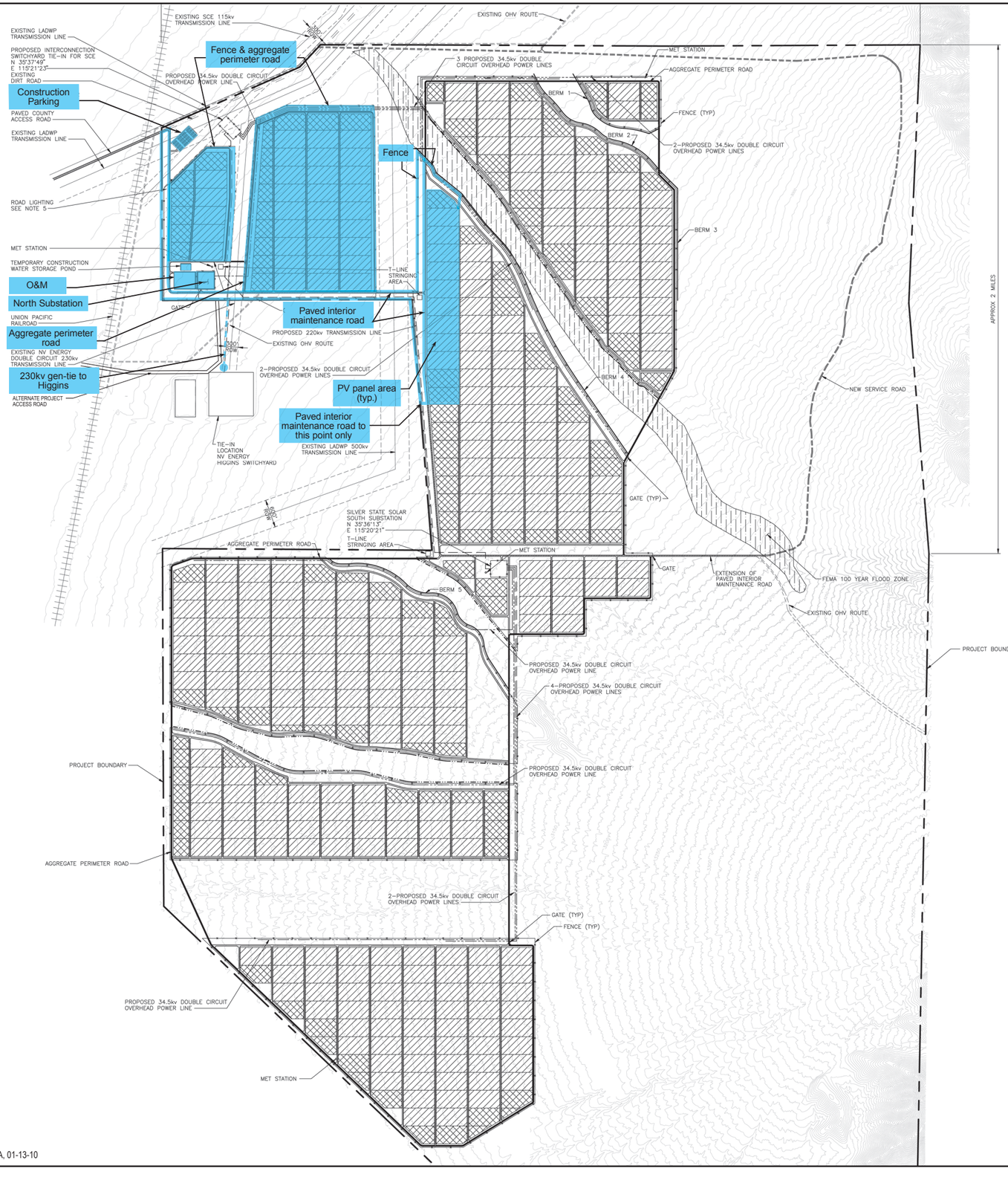
1. ALL 34.5 KV OVERHEAD POWER LINES ARE SPACED 30' CENTER TO CENTER ON 45' TALL POLES SPACED 150' ON CENTER.
2. CONTOURS SHOWN AT 10' INTERVALS.
3. ALL ROADS ARE PROPOSED/NEW UNLESS NOTED OTHERWISE.
4. PROPOSED SUBSTATIONS AND INTERCONNECTION SWITCH YARD ARE INDIVIDUALLY ENCLOSED WITH FENCING SEPARATE FROM OVERALL PROJECT BOUNDARY FENCING.
5. ROAD LIGHTING TO BE SPACED AT APPROXIMATELY 200'-0" INTERVALS.

NOT TO BE USED FOR CONSTRUCTION

THE DISTRIBUTION AND USE OF THE NATIVE FILE FORMAT OF THIS DRAWING OUTSIDE OF BLACK & VEATCH IS UNCONTROLLED AND SHALL BE USED FOR REFERENCE PURPOSES ONLY.

FIGURE 3-1
Construction Phases
Silver State Solar
Clark County, Nevada

Source: Black & Veatch, Corp., Drawing 164562-SS-1034A, 01-13-10



VICINITY MAP
NO SCALE

ABBREVATIONS

SCE = SOUTHERN CALIFORNIA EDISON
LADWP = LOS ANGELES DEPARTMENT OF WATER AND POWER
MET STATION = METOROLOGICAL MONITORING STAION, 10' TALL

LEGEND

- DESIGNATES FULL BLOCK OF PV PANELS PER DWGS 164562-SS-1034B TO 1034D
- DESIGNATES PARTIAL BLOCK OF PV PANELS WITH SAME ROW AND PANEL SPACING, BUT FOR A PARTIAL AREA.
- PAVED INTERIOR MAINTENANCE ROAD
- AGGREGATE PERIMETER ROAD
- INTERIOR SERVICE ACCESWAYS (GRADED COMPACTED DIRT)
- NEW SERVICE ROAD (GRADED, UNIMPROVED)
- LIMITS OF WASH WITH BERM
- LIMITS OF WASH

NOTES

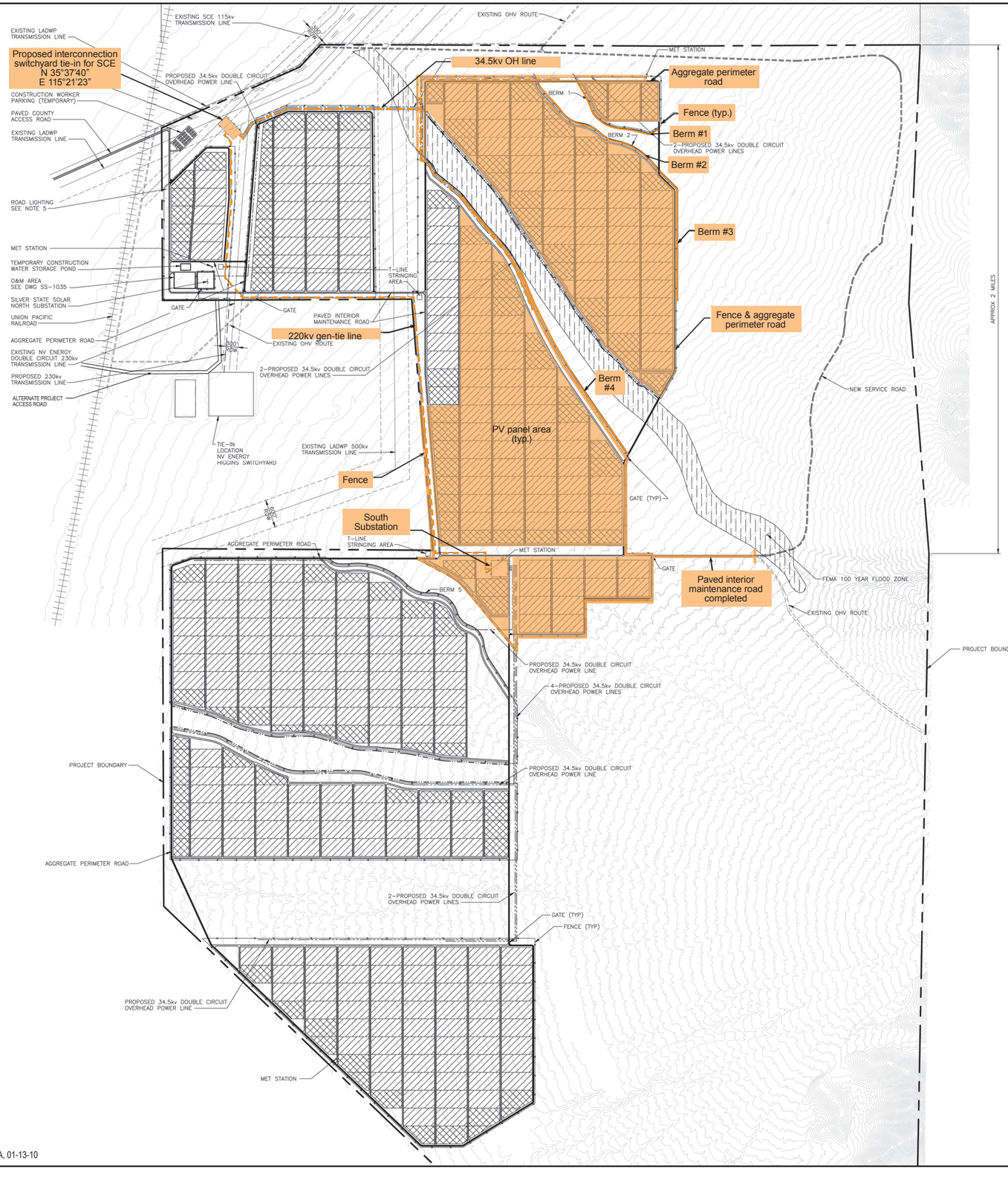
1. ALL 34.5 KV OVERHEAD POWER LINES ARE SPACED 30' CENTER TO CENTER ON 45' TALL POLES SPACED 150' ON CENTER.
2. CONTOURS SHOWN AT 10' INTERVALS.
3. ALL ROADS ARE PROPOSED/NEW UNLESS NOTED OTHERWISE.
4. PROPOSED SUBSTATIONS AND INTERCONNECTION SWITCH YARD ARE INDIVIDUALLY ENCLOSED WITH FENCING SEPARATE FROM OVERALL PROJECT BOUNDARY FENCING.
5. ROAD LIGHTING TO BE SPACED AT APPROXIMATELY 200'-0" INTERVALS.

NOT TO BE USED FOR CONSTRUCTION

THE DISTRIBUTION AND USE OF THE NATIVE FILE FORMAT OF THIS DRAWING OUTSIDE OF BLACK & VEATCH IS UNCONTROLLED AND SHALL BE USED FOR REFERENCE PURPOSES ONLY.

FIGURE 3-2
Phase 1
Silver State Solar
Clark County, Nevada

Source: Black & Veatch, Corp., Drawing 164562-SS-1034A, 01-13-10



VICINITY MAP
NO SCALE

ABBREVATIONS

SCE = SOUTHERN CALIFORNIA EDISON
LADWP = LOS ANGELES DEPARTMENT OF WATER AND POWER
MET STATION = METOROLOGICAL MONITORING STAION, 10' TALL

LEGEND

- DESIGNATES FULL BLOCK OF PV PANELS PER DWGS 164562-SS-1034B TO 1034D
- DESIGNATES PARTIAL BLOCK OF PV PANELS WITH SAME ROW AND PANEL SPACING, BUT FOR A PARTIAL AREA.
- PAVED INTERIOR MAINTENANCE ROAD
- AGGREGATE PERIMETER ROAD
- INTERIOR SERVICE ACCESWAYS (GRADED COMPACTED DIRT)
- NEW SERVICE ROAD (GRADED, UNIMPROVED)
- LIMITS OF WASH WITH BERM
- LIMITS OF WASH

NOTES

1. ALL 34.5 KV OVERHEAD POWER LINES ARE SPACED 30' CENTER TO CENTER ON 45' TALL POLES SPACED 150' ON CENTER.
2. CONTOURS SHOWN AT 10' INTERVALS.
3. ALL ROADS ARE PROPOSED/NEW UNLESS NOTED OTHERWISE.
4. PROPOSED SUBSTATIONS AND INTERCONNECTION SWITCH YARD ARE INDIVIDUALLY ENCLOSED WITH FENCING SEPARATE FROM OVERALL PROJECT BOUNDARY FENCING.
5. ROAD LIGHTING TO BE SPACED AT APPROXIMATELY 200'-0" INTERVALS.

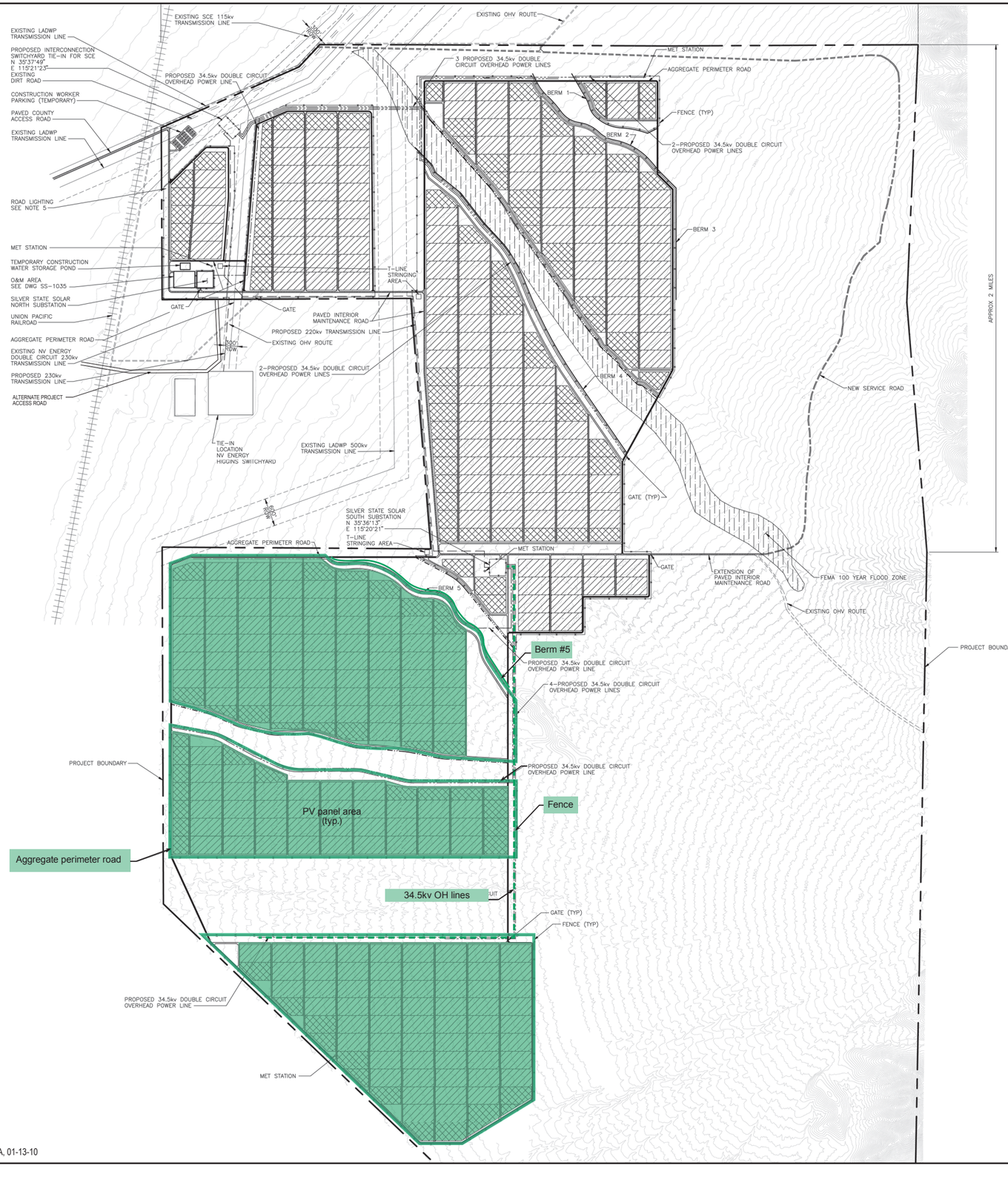
NOT TO BE USED FOR CONSTRUCTION

THE DISTRIBUTION AND USE OF THE NATIVE FILE FORMAT OF THIS DRAWING OUTSIDE OF BLACK & VEATCH IS UNCONTROLLED AND SHALL BE USED FOR REFERENCE PURPOSES ONLY.

800 0 800 1600
APPROXIMATE SCALE IN FEET

FIGURE 3-3
Phase 2
Silver State Solar
Clark County, Nevada

Source: Black & Veatch, Corp., Drawing 164562-SS-1034A, 01-13-10



VICINITY MAP
NO SCALE

ABBREVATIONS

SCE = SOUTHERN CALIFORNIA EDISON
LADWP = LOS ANGELES DEPARTMENT OF WATER AND POWER
MET STATION = METOROLOGICAL MONITORING STAION, 10' TALL

LEGEND

- DESIGNATES FULL BLOCK OF PV PANELS PER DWGS 164562-SS-1034B TO 1034D
- DESIGNATES PARTIAL BLOCK OF PV PANELS WITH SAME ROW AND PANEL SPACING, BUT FOR A PARTIAL AREA.
- PAVED INTERIOR MAINTENANCE ROAD
- AGGREGATE PERIMETER ROAD
- INTERIOR SERVICE ACCESWAYS (GRADED COMPACTED DIRT)
- NEW SERVICE ROAD (GRADED, UNIMPROVED)
- LIMITS OF WASH WITH BERM
- LIMITS OF WASH

NOTES

1. ALL 34.5 KV OVERHEAD POWER LINES ARE SPACED 30' CENTER TO CENTER ON 45' TALL POLES SPACED 150' ON CENTER.
2. CONTOURS SHOWN AT 10' INTERVALS.
3. ALL ROADS ARE PROPOSED/NEW UNLESS NOTED OTHERWISE.
4. PROPOSED SUBSTATIONS AND INTERCONNECTION SWITCH YARD ARE INDIVIDUALLY ENCLOSED WITH FENCING SEPARATE FROM OVERALL PROJECT BOUNDARY FENCING.
5. ROAD LIGHTING TO BE SPACED AT APPROXIMATELY 200'-0" INTERVALS.

NOT TO BE USED FOR CONSTRUCTION

800 0 800 1600
APPROXIMATE SCALE IN FEET

FIGURE 3-4
Phase 3
Silver State Solar
Clark County, Nevada

Source: Black & Veatch, Corp., Drawing 164562-SS-1034A, 01-13-10

TABLE 3-2
Anticipated Construction Schedule (Calendar Year)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
		2010		2011				2012				2013				2014		
Task	**Description**	**4Q**	**1Q**	**2Q**	**3Q**	**4Q**	**1Q**	**2Q**	**3Q**	**4Q**	**1Q**	**2Q**	**3Q**	**4Q**	**1Q**	**2Q**	**3Q**	**4Q**
1	Environmental Clearance[a] (includes construction of Desert Tortoise Fencing)[b]	1	1	1				2	2	2	2	2	2					
												3	3	3	3	3		
2	Site Access/Laydown		1	1														
3	Well Field/Pond	1	1															
4	Site Preparation			1	1													
									2	2	2	2	2					
												3	3	3	3	3		
5	O&M Area—Building Construction			1	1													
6	Drainage Controls									2	2	2	2					
														3				
7	Substation/Switchyard			1	1													
										2	2	2						
8	Overhead pole/line construction			1	1													
											2	2	2					
														3	3	3		
9	PV Equipment Installation/ Commissioning			1	1	1												
											2	2	2	2	2	2		
														3	3	3	3	3
	Initial Power Deliveries				1							2			3			
	Commercial Operation					1										2		3

Q=Quarter
[a]The environmental clearance activities will be performed sequentially in each of the Project areas as they are constructed. Clearance activities include survey and relocation or translocation for desert tortoise (DTRO guidance pending) subject to approved seasonal conditions.
[b]Desert Tortoise fencing will be constructed as the first activity within each phase of construction.

TABLE 3-3
Anticipated Project Construction Activities

Major Task ID	Task	Construction Phase Timeframe (to begin)			Activities
		1	2	3	
1	Environmental Clearance	4Q10	2Q12	2Q13	• Review and comply with relevant plans and construction documents • Delineate and mark the boundaries of the construction zone • Install security and tortoise fencing • Complete wildlife (desert tortoise) survey and removal activities • Complete cacti and yucca salvage as necessary • Stake and fence sensitive areas for construction exclusion as necessary
2	Establish Site Access and Laydown	1Q11			• Stabilize construction entrance/exit and roadway • Install tire wash • Establish parking and staging areas for vehicle and equipment storage, maintenance • Establish fabrication and laydown area(s) for fabrication, assembly, and materials storage/staging • Establish concrete washout area
3	Construct Well Field and Construction Ponds	4Q10			• Site and drill production wells • Test and complete wells • Construct temporary lined ponds for construction water storage
4	Site Preparation	2Q11	3Q12	2Q13	• Mow vegetation to 6 to 12 inch height • Install erosion controls as specified in project plans • Establish construction roads and access ways • Localized grading for equipment foundations
5	O&M Building construction	2Q11			• Construct foundation • Erect modular steel building • Erect temporary tent structure • Install septic tank and drain field
6	Drainage Controls		4Q12	4Q13	• Survey and stake • Create debris basins/berms • Create level spreaders

TABLE 3-3
Anticipated Project Construction Activities

Major Task ID	Task	Construction Phase Timeframe (to begin)			Activities
		1	2	3	
7	Substation/Switchyard Construction	2Q11	4Q12		• Excavate for grounding grid • Backfill/compact/level surface • Pour equipment foundations • Transformer/breaker installation • Buswork/structure installation • Install control house • Electrical terminations • Inspect/test/commission
8	Overhead pole/line construction	2Q11	1Q13	4Q13	• Construct foundations • Erect poles • String conductors • Install grounding • Erect modular steel building • Erect temporary tent structure
9	PV Equipment installation and commissioning	2Q11	1Q13	4Q13	• Trenching for underground cable • Underground cable installation • Trench backfill • Install ballast/pier supports • Install PV modules • Install/connect tracker linkage (if used) • Inverter/transformer installation • Electrical terminations • Inspections, test, commission

TABLE 3-4
Draft Construction Phasing Table (Area of Disturbance by Section)

Facility	Total Acreage	Section 1	Section 2	Section 3
Facilities Within Perimeter Fence[a]				
230kV Transmission Line[b] (North Substation to Bighorn Substation)	1.0	1.0	—	—
220kV Transmission Line (South Substation to switchyard)	16.3	—	—	16.3
34.5kV Collection Lines	31.5	1.6	9.8	20.1
O&M Area	3.6	3.6	—	—
North Substation	2.8	2.8	—	—
South Substation	2.8	—	—	2.8
Internal Access:				
Maintenance Road	12.5	7.3	5.2	—
Perimeter Road	41.0	6.6	14.4	20.0
Solar field access ways	84.7	13.7	34.1	36.9
Solar field	2,575	415	1,038	1,122
Undeveloped Area[c]	93.8	4.3	39.9	49.6
Total Area	**2,865**	**455.9**	**1,141.4**	**1,267.7**
Facilities Outside Perimeter Fence				
230kV Transmission Line[d] (North Substation to Bighorn Substation)	1.8	1.8	—	—
34.5kV Collection Lines	4.1	0.1	2.4	1.6
Switchyard	2.6	—	2.6	-
Drainage Control Berms[e]	17.7	—	7.6	10.1
Drainage Control Berm Temporary Construction Area[f]	11.0	—	5.3	5.7
Extension of Maintenance Road	1.5	—	1.5	—
Construction Worker Parking (Temporary)	3.8	3.8	—	—
Firebreak	33.1	12.0	9.8	11.3
Service Road	8.27	8.27	—	—
Alternate Project Access Road[h]	1.1			
Total Area	**84.97**	**27.07**	**29.2**	**28.7**
Related Facilities				
Project Access Road (Paved County Access Road from I-15 frontage to facility)[g]	7.5	7.5	—	—
Bighorn Substation Expansion (NV Energy)	10	10	—	—
Total Area	**17.5**	**17.5**	**—**	**—**
Total Project Facilities Area	**2,949.97**	**482.97**	**1,170.6**	**1,296.4**
Total Project Facilities + Related Facilities	**2,966.37**	**499.37**	**1,170.6**	**1,296.4**

[a]The entire area within the perimeter fence is assumed to be disturbed
[b]Portion of 230kV transmission line within perimeter fence
[c]Area within perimeter fence not occupied by equipment, but assumed to be disturbed
[d]Portion of 230kV transmission line outside perimeter fence
[e]Area occupied by drainage control berms
[f]Additional area anticipated to be disturbed during construction of drainage control structures
g Although the preferred access road is the County Road, this alternate access road is included in the project acreage because it would be built by NextLight for project access if the County did not proceed with construction of the County road.
[h]Project Access Road will be permitted and improved by Clark County and will be a county road.

3.1.4 Construction Description

Project construction will begin after the BLM issues the ROW grant, other necessary agency approvals have been issued, and preconstruction conditions in the ROW grant and other approvals have been met. Construction will be scheduled to align with the delivery dates negotiated with the utility customers. Prior to any activity on the site, required resource protection plans will be developed, and regulatory and permit conditions will be integrated into the final construction compliance documents. The activities described in Sections 3.1.4.1 through 3.1.4.6

3.1.4.1 Environmental Clearance and Fencing

Site mobilization activities for each construction phase will begin with obtaining environmental clearance, which includes compliance with relevant plans and guidance and onsite presence of professional biologists to address desert tortoise fence installation, desert tortoise relocation/translocation, and meeting cactus salvage requirements. The Project is not located within or adjacent to designated critical habitat for desert tortoise.

Comply with Plans and Construction Documents. Prior to initiating site mobilization, NextLight will complete environmental clearance, which will focus on ensuring that site activities are reviewed and approved for compliance with resource protection plans (including the Desert Tortoise Relocation Plan that will be prepared by NextLight for BLM and USFWS review) and with approved construction compliance documents.

Install Security and Desert Tortoise Fencing. NextLight will first delineate and mark the boundaries of each construction area, followed immediately by security fencing (see Figure 3-1) and tortoise fencing (see Attachment 3) installation around the perimeter of each construction area.

These two types of fences will be installed at the same time for each of the construction sequences (see Figures 3-1 through 3-4). The objective of the security fencing is to ensure safe and efficient construction and operation of the facility. The security fence will be a chain-link fence with post-spacing every 10 feet, and will be 8 feet high, including a barbed wire barrier extending from the crown of the chain link. Figure 3-5 shows a schematic of the security fencing.

The desert tortoise fencing will be installed to prevent the reintroduction of sensitive species to the area. It will be installed for each phase at the same time the security fencing is installed and will accommodate the area affected by the berms constructed directly outside of the perimeter fence (see Sections 2.2.4.7 and 3.1.4.6 of this BA for a description of the berms and Figure 2-2c for the location of the berms). The desert tortoise fencing will be installed, inspected and repaired (as applicable) in compliance with the "Recommended Specifications for Desert Tortoise Exclusion Fencing." These specifications and drawings of desert tortoise fencing are described and shown in detail in Attachment 3 of this BA.

Construction of security and desert tortoise fencing will include only the fenced areas designated for each construction phase. Figure 2-2d shows the location of the fencing for the entire Project. However, only the fencing required for each construction phase will be constructed during each construction phase. Figures 3-1 through 3-4 delineate the areas to be fenced during the first, second and third phases of construction.

Conduct Desert Tortoise Surveys and Removal. Surveys will be conducted for desert tortoise, followed by relocation or translocation in accordance with an approved Desert Tortoise Relocation Plan prepared in accordance with the USFWS's Desert Tortoise Relocation Office guidance. Professional biologists will survey and relocate/translocate desert tortoise and perform other sensitive species removal and mitigation. Concurrent with tortoise surveys and removal, professional biologists will also be used to meet cactus salvage requirements.

Timing of Environmental Clearance and Fencing. The environmental clearance activities will be performed sequentially in each of the Project phases as they are constructed. Environmental clearances will first be obtained for the site access roads (including the service road outside the perimeter fence), well field, construction water storage pond, and O&M area. Subsequent clearances will be obtained for each of the remaining major tasks, as presented in Tables 3-2 and 3-3. Environmental clearance will occur only during weather conditions permitted for the activity. The schedule provided in Table 3-2 provides for multiple environmental clearance windows for each construction phase.

3.1.4.2 Site Access and Laydown

Upon completion of the environmental clearance activities, the Project construction contractor will develop temporary construction facilities and laydown areas required to build the Project. These facilities include:

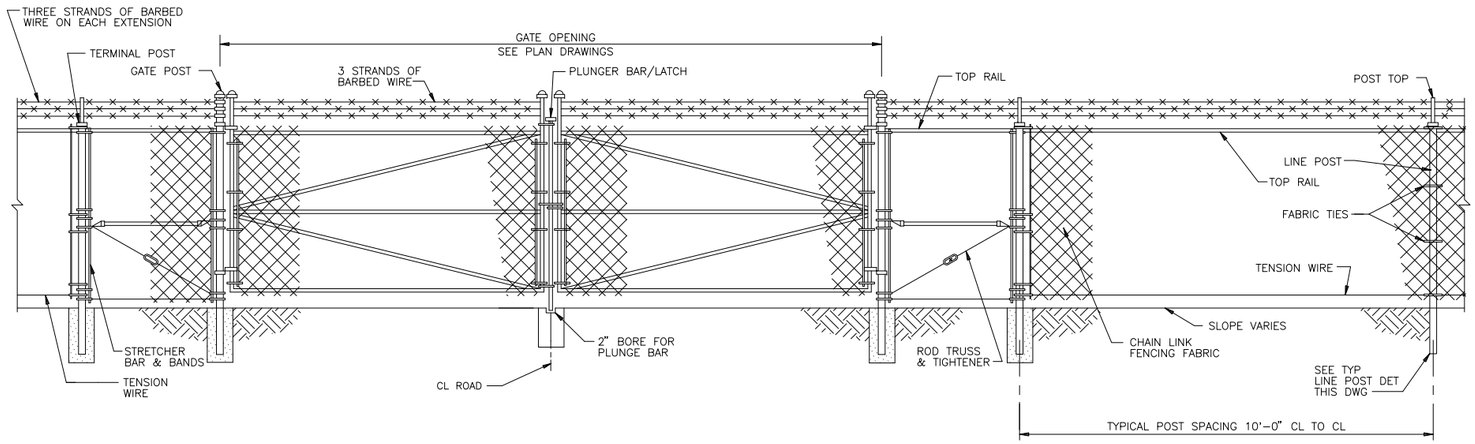
- Full-length trailer offices or equivalent
- Chemical toilets
- Parking for construction vehicles
- Tool sheds/containers
- Parking for construction equipment
- Construction material laydown area
- Solar field equipment laydown area

Temporary covered assembly areas will be located adjacent to the permanent O&M building on the Project site. The Project site area itself will be used for construction laydown as further described in Attachment 1.

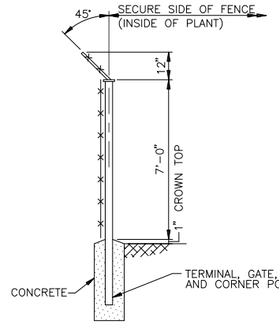
Following completion of environmental clearance for the site access and laydown areas (which include the Project Access Road and O&M area), the site access and laydown area will be prepared for use. The activities described below will occur only during the first phase of the Project because the site access and laydown area developed in that area will be used for the remainder of the Project site.

The area will be cleared and grubbed of vegetation. Organic matter will be mulched onsite and redistributed into the fill (except under equipment foundations, trenches and roadways) to aid in dust control. The area will also be graded with an approximate 12 inch cut/fill and compacted to establish suitable groundwork for foundations and equipment laydown.

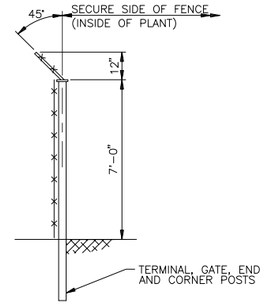
The construction entrance and exit gates will be established. A tire wash area will be established to prevent the removal of soil and maintain a clean access road. Parking and staging areas will be staked for temporary and permanent building erection at a later stage.



TYPICAL CHAIN LINK SECURITY FENCE WITH SWING GATE
NO SCALE



TYPICAL CONCRETE ENCASED POST
NO SCALE



TYPICAL LINE POST
NO SCALE

NOT TO BE USED FOR CONSTRUCTION

FIGURE 3-5
Security Fence
Silver State Solar
Clark County, Nevada

Source: Black & Veatch, Corp., Drawing 164562-SS-1034J, 02-02-10

Temporary equipment storage and laydown areas will be compacted and marked with temporary stakes and signage. The Maintenance Road will then be prepared with an aggregate rock base and paved.

The Project Access Road alignment currently serves as an unpaved RS 2477 Road. A temporary bypass route will be designated by BLM, if necessary, to enable backcountry access during construction of the Project Access Road. Some additional clearing and grubbing will be necessary to widen the existing road to create a suitable prism for an all-weather paved roadway between the I-15 frontage road and the O&M area entrance.

3.1.4.3 Well Field and Construction Water Storage

To provide sufficient water for the remaining construction phases, an on-site well and temporary storage pond will be constructed. The activities described below will occur only during development of the initial phase of construction because the wellfield and construction water storage components developed in this first phase will also be used for development of the remainder of the site.

The water well will be drilled to a depth of approximately 600 feet using a truck-mounted drilling rig. Estimated well depth is based on existing groundwater basin information and actual depth may vary. A smaller, potable water well will also be drilled to provide a water source for treated water for use in the O&M building.

A construction water storage pond of 200 feet by 140 feet will be excavated and lined for the temporary storage of water during the construction period. This will provide sufficient water for dust control during construction without negatively affecting well draw down during peak water usage periods. After the construction period, the construction water storage pond will be re-leveled to grade and the lining removed.

3.1.4.4 Site Preparation

Within each area of construction, the vegetation will be mowed using a conventional "brush-hog" to a height of not more than 12 inches. Portions of each area will be cleared and grubbed to remove vegetation. The cleared portions will include the Maintenance Road, aggregate Perimeter Road, interior access ways and equipment foundations. Organic matter will be mulched and redistributed within the construction area (except in trenches and under equipment foundations).

The aggregate Perimeter Road will require approximately 48,800 tons of aggregate in total. The aggregate will be Nevada DOT Class 2 Type A aggregate base. The material is a well grade aggregate with a range from 1" to the #200 sieve.

3.1.4.5 O&M Area Construction

Following environmental clearance and site preparation of the O&M area, construction in the O&M area will commence. The O&M area will also serve as the central construction staging and fabricating area for the Project. This construction task applies only to the initial phase of construction because the O&M area will serve as a common operations and maintenance facility for subsequent construction. Concrete foundations will be poured to support the permanent O&M building and an area adjacent to the building will be paved for

parking. The modular steel building will be erected. A 4-inch aggregate base will be installed on all unpaved areas within the O&M area.

Water tanks for will be erected and connected to a service pump. The active and reserve septic field will be established and connected to O&M buildings waste system. Temporary construction power will be connected to the O&M building. The potable water treatment equipment will be installed in the O&M building and the water pump and line will be connected to the potable water well.

A temporary tent structure will be erected to provide a covered work area for storage and assembly of materials. The tent is used to provide cover from direct sunlight for the construction crew during meeting, pre-assembly and inventory activities. The tent will be removed at the end of the construction period.

Erection of a Clark County dust control sign will be installed at the main entrance gate at this time.

3.1.4.6 Erosion Control and Stormwater Drainage

As discussed in Section 2.2.4.7, all the berms will be constructed outside the perimeter fence. The activities described below will occur after the initial construction activities described above in Section 3.1.4.1 through 3.1.4.5 are completed.

Berms. The drainage control berms, which will be located outside the perimeter fence of the Project site, will occupy approximately 17.7 acres. Construction is anticipated to disturb an additional estimated 11 acres. Prior to berm construction in each phase, the area will be surveyed for desert tortoise and relocation/translocation activities will be conducted; desert tortoise fencing will be installed, as appropriate. Following completion of the drainage structures, areas disturbed during construction will be restored in accordance with an approved restoration plan.

Following the first construction activities, Berms 1, 2, 3, and 4 will be constructed. Construction of Berm 5 will then occur.

Berm 3 will control storm flow from offsite flows originating upstream of the Project site on the alluvial fan. Figures 2-2 and 2-2c show the location of the berms to be constructed in Phases 2 and 3. Figure 2-4 shows a conceptual design of the berms. The existing stormwater flow corridors will not be disturbed except for at-grade road crossings to permit service vehicles to traverse the site and construction of transmission lines. Within these stormwater flow corridors washes, no grading will occur and vegetation will be trimmed only to the extent that it would cast a shadow on the solar array.

Berm 3 will be approximately 3,000 feet long, 5 feet high, and approximately 15 feet wide at the top. Berm 3 will extend south from the existing stormwater flow corridor delineated by Berms 1 and 2 to direct and prevent stormwater flow in the localized area from bypassing the natural wash areas.

Berms 1, 2, 4, and 5 will be placed along some of the existing primary natural washes to prevent the washes from migrating from their current path. Berms will be omitted from the side of some washes to allow storm water that originates upstream from the project site and flows across the solar field to enter the washes. The berms will be built outside the existing

washes and FEMA flood zone to keep the stormwater within the current washes, but still allow the wash to meander within the wash limits defined by the berms. As discussed above, no excavation or vegetation removal would occur inside the washes except for the east and west ends where compacted earth or aggregate roads are required to cross the washes.

Construction Material. Approximately one half of the 58,000 cubic yards of soil material required to construct the berms will be obtained from excess soil material obtained from other excavating activities onsite, primarily the berm construction itself. The remaining soil material will be obtained from an offsite source. To restore the native look to the earthen berms, the top 4 inches of onsite material would be salvaged and placed over the berms to provide a homogenous appearance and preserve sensitive soils.

The inside face of each berm will likely require a more erosion-resistant material than soil. Appropriate sized rock that will be used to minimize erosion would be obtained from onsite grading operations, to the maximum extent possible. By placing a 2-foot thick layer of rock on the wash side of the berm, approximately 25,000 cubic yards of rock material would be required. It is anticipated that a majority of rock material would be obtained from an offsite rock quarry. Rock material obtained from offsite sources would be of a similar color as the onsite rock material. A BLM approved material, such as Permeon, may be applied to the rock surface to assist with weathering and blending of the berm's appearance with the surrounding area. Along the interior washes, vegetation will be re-planted on the southern berm of each wash where it will not cause shading of the solar array.

3.1.4.7 Substation/Switchyard Construction

Areas of the Project designated as substations and switchyards will be constructed based on applicable electrical safety codes. Each substation and switchyard will be separately fenced to provide increased security around the medium and high voltage electrical equipment.

The substation and switchyard areas will be excavated to a depth of 10 feet. A copper grounding grid will be installed and the foundations for transformers and metal structures will be prepared. The areas will be backfilled, compacted and leveled followed by the application of 6 inches of aggregate rock base. The substations and switchyard will require approximately 10,000 tons of aggregate rock in total. The aggregate will be Nevada DOT washed Number 4 concrete aggregate. The material is a uniformly grade aggregate with a range from 1 1/2" to 3/8".

Equipment installation of the transformers, breakers, buswork and metal dead-end structures will follow. A pre-fabricated control house will be installed to house the electronic components required of the substation and switchyard equipment.

3.1.4.8 Overhead Pole/Line Construction

Two types of overhead transmission line poles will be erected – steel monopole 220kV/230kV poles for interconnection of the high voltage electrical system and wooden monopole 34.5kV poles for collection of the medium voltage electrical system.

Stringing areas, as identified on the site layout (Figure 2-2) will be established and the location of each pole will be surveyed and staked. Foundations for each pole type will be constructed. The 220kV/230kV monopoles will have a foundation excavated to 12 to 30 feet

in depth and 4 to 7 feet in diameter depending on the local soil conditions and the purpose of the poles (end and angle structures required deeper foundations). These foundations will be reinforced rebar foundations and backfilled with concrete. The 34.5kV poles will require a 2-foot-wide augured hole 8 feet deep.

After pole erection, conductor stringing and grounding will be performed.

3.1.4.9 PV Equipment Installation

Prior to any construction in PV equipment areas, the environmental clearance and site preparation steps for those areas will be completed. Within each area designated for PV equipment, the construction sequence will follow a generally consecutive order.

The construction of the solar field will proceed in 1MW blocks. Each block will be approximately 700 feet by 400 feet and will contain solar panels, an inverter and step-up transformer. Within each 1MW, a temporary laydown area has been designated for local deployment of materials and equipment prior to construction of that block (see Figures 1-5, 1-7, and 1-9 in Attachment 1).

- Prepare trenches for underground cable
- Install underground cable
- Backfill trenches
- Install ballast or pier supports
- Install/connect tracker motors and linkage (if used)
- Install PV modules
- Install inverter and transformer equipment
- Perform electrical terminations
- Inspect, test and commission equipment

Trenches will be excavated to a depth of 3 feet and width of 2 to 3 feet. Organic material will be mulched and redistributed on-site except under equipment foundations or as trench backfill material. Underground cable will be installed and "stubbed up" to provide cable access during the electrical terminations step.

Trenches will be backfilled with a sand bed 3 to 4 inches above and below buried cables. The trenches will be further backfilled with native soils and compacted. Excess soil will be redistributed on site and used to provide level ground for equipment foundations for inverters, transformers and tracker motor foundations (if used).

Support foundations for PV structures will be composed of either concrete foundations (with an embedded galvanized steel pier) that sit at or below grade or directly driven galvanized steel piers driven to a depth of 8 to 12 feet. The Project is expected to make use of both concrete foundations and driven steel piers. This selection will be finalized after geotechnical and soils data in each area is obtained and prior to construction.

Embedded piers will be installed by either vibratory pounders or hammer type pounders that are mounted to a truck or track hoe. Concrete foundations will be typically laid directly on the ground or poured into a hole augured 18 to 24 inches wide and 6 to 8 feet deep. On steeper portions of the site, creation of small foot pads may be necessary so that vertical elevation change between trackers does not exceed 5 percent.

Atop each pier, a galvanized steel "table" will be installed to provide a mechanical mounting structure for the PV modules. Fixed tilt structures utilize fixed pier mounting that do not allow rotation of the table. Tracking structures utilize rotating pier caps with bushings between the table and foundations.

For tracking structures, a concrete equipment pad is poured to support the drive motor. Mechanical linkage is connected to each tracker unit. The tracker motors/foundations are located at each row and are approximately 700 feet apart. Alternatively, depending on specific horizontal tracking technology selected, tracking motors may be mounted directly on the tracker structures. In this configuration, each tracker assembly has its own drive system and there is no motor foundation or mechanical linkage from one tracker to the next. Hydraulic drive systems will not be used.

PV modules are then mechanically attached to each table.

The inverter/transformer concrete equipment pad is poured to provide a suitable mounting surface for the equipment. A pre-fabricated enclosure containing the inverters and communication equipment is installed on the equipment pad. A 3-phase, medium voltage transformer is also installed on the equipment pad.

Once all equipment is physically and electrically inspected, PV modules are terminated to the inverters and the transformers are terminated to the underground cabling.

3.2 Access and Transportation System

Project-related roads are the access roads, perimeter road, maintenance road, solar field access ways, and service road, as described in Section 2.2.4.6 of this BA and summarized in Table 2-4. The new roads that will be paved are the Project Access Road (County Road RS 2477), Alternate Project Access Road (to be constructed only if the Project Access Road is not constructed by the County), and the Maintenance Road. Access to the Project will be provided by constructing a Project Access Road on the alignment of the existing RS2477 road from the I-15 frontage road to the Project site (see Figures 2-2 and 2-2a). If the County road is not built, alternate site access will be via a new 0.3-mile-long, 30-foot-wide road Alternate Access Road prepared with an aggregate rock base and paved.

A new interior Maintenance Road will be constructed within the fenced area of the site to provide access to the O&M building. The road will be a paved road that begins where the new Project Access Road ends (at the Project site boundary). This road will be approximately 3.85 miles long and 30 feet wide.

A new gravel (aggregate rock) Perimeter Road will be located just inside of the site's perimeter fence and will be constructed to allow access by maintenance and security personnel. This road will be approximately 13.4 miles long and 25 feet wide.

The solar field access ways will be compacted-earth construction. They will comprise approximately 34.9 miles and be approximately 20 feet wide. The access ways will be approximately every 700 feet across the solar field. The existing surface area will be graded and compacted using onsite materials to facilitate use by two-wheel-drive vehicles.

The service road providing secondary site access will be unimproved and graded. An 8.27-mile-long and 15-foot-wide Service Road will be constructed outside the perimeter fence, as illustrated in Figure 2-2, to provide secondary access to the site. The new road will be graded to accommodate four-wheel-drive vehicles. Relevant environmental clearance measures described in Section 3.1.4.1 will be implemented prior to road grading.

Access road beds will typically be 20 feet wide, with 6-foot-wide crushed rock shoulders. A stabilized entrance/exit will be provided to clean vehicle wheels prior to exiting the construction area. Most construction staff and workers will come daily to the jobsite from within Clark County.

During peak construction, an estimated 56 truck trips per day will be required to supply concrete, construction materials, Project components, and equipment to the site. To provide concrete for PV module foundations and other uses, either a concrete batch plant will be located on-site or an off-site ready mix plant will be used. In either case, a similar number of trucks would be required to supply either concrete or concrete raw materials.

Temporary construction parking will be provided in the northwest corner of the project site as indicated on Figure 1-4. This area will provide sufficient parking for the construction workforce traveling to the project site in their personal vehicles. Parking areas for construction vehicles and laydown areas for construction materials will be prepared inside the solar field area (see Attachment 1, Figures 1-5, 1-7 and 1-9, for areas designated as Temporary Construction Laydown Areas).

3.3 Construction Workforce Numbers, Vehicles, Equipment, Timeframes

The onsite construction workforce will consist of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel. The onsite construction workforce is expected to be approximately 230 to 400 depending on the rate of construction.

Construction will generally occur between 7 a.m. and 7 p.m., Monday through Friday. Additional hours may be necessary to make up schedule deficiencies, or to complete critical construction activities. For instance, during hot weather, it may be necessary to start work earlier to avoid pouring concrete during high ambient temperatures. Further, construction requirements will require some night-time activity for installation, service or electrical connection of photovoltaic panels while no sunlight is present. Nighttime activities will be performed with temporary lighting.

Construction materials such as concrete, pipe, PV modules, tracker assemblies, wire and cable, fuels, reinforcing steel, and small tools and consumables will be delivered to the site by truck. Initial grading work will include the use of track-driven excavators, graders, dump trucks, and end loaders, in addition to the support pickups, water trucks, and cranes. It is anticipated that approximately 20 pieces of this type of large equipment will be onsite for the first year of construction for grading. As the Project moves into the next stages of civil work, equipment for foundations and road construction will be brought in, including paving machines, trenching machines, concrete mixers and pumps, additional excavators

for foundation drilling, tractors, and additional support vehicles. Based on similar projects, this type of work will continue into Month 48 of the Project as the solar field is built out.

It is anticipated that the following equipment will be required:

- Scraper (3)
- Motor grader (3)
- Excavator (4)
- Dozer (3)
- Dump truck (4)
- Pad drum vibratory roller (2)
- 4,000-gallon water truck (6)
- Concrete truck (6)
- Backhoe/loader (2)
- Truck mounted crane (5)
- Grade-all (5)
- Flatbed truck (5)
- Trencher (3)
- Lightweight truck (50)

3.4 Site Preparation: Surveying and Staking

A licensed professional surveyor will conduct a land survey of the project site and will stake the construction area as needed before construction begins.

3.5 Site Preparation: Vegetation Removal and Treatment

Vegetation will be trimmed to an average height of not more than 12 inches just ahead of the PV module installation activity. Except where excavation or grading is proposed, the root systems of existing vegetation will be left in place to provide soil stability.

The project will establish a plant nursery on site during clearing as necessary in order to store salvage plants, including cactus and yucca that are protected under Nevada State law (Nevada Revised Statues 527.060-120 and Nevada Administrative Code [NAC] 527). As determined necessary, before clearing, field crews will salvage cacti and yucca to meet requirements established by the State. As determined by BLM, plants will be made available for commercial and public use.

3.5.1 Vegetation Treatment and Weed Management

3.5.1.1 Vegetation Treatment

Vegetation will be cut to a height of less than 12 inches within the solar field area, and areas identified for structures and transmission lines as shown on Figure 2-2 of this BA. Vegetation will be cleared from roadways, access ways and where concrete foundations are used for inverter equipment, substations and the O&M facilities. Vegetation will also be cleared for construction of the drainage control berms. A 20-foot-wide firebreak will be established around the outside of the perimeter fence.

In general, plant root systems will be left in place, except where grading and trenching is required for placement of solar module foundations, underground electric lines, inverter and transformer pads, roads and access ways, drainage control berms, and other facilities. Vegetation will be maintained to a height of no more than approximately 12 inches as needed for site maintenance and fire-risk management using mechanical and chemical controls.

3.5.1.2 Noxious Weed Control

Noxious or invasive weeds are known to occur in the Project area. Nevada Revised Statutes, Chapter 555.05 defines "noxious weeds" and mandates landowners and land management agencies to control noxious weeds on lands under their jurisdiction. BLM defines a noxious weed as a "plant that interferes with management objectives for a given area of land at a given point in time." Noxious weeds may invade disturbed areas such as construction sites and may continue to invade for many years following the initial ground-disturbing activity for construction. In addition, construction equipment is a known noxious weed vector and can transport weeds to previously weed-free areas or cause the rapid increase of noxious weeds that are already established. Some weeds of concern include Sahara mustard (*Barassica tournefortii*), saltcedar (*Tamarix ramosissima*), red brome (*Bromus madritensis* spp. *Rubens*), and filaree (*Erodium* sp.), among others. Weeds are a threat to ecosystem health in southern Nevada. The presence of weeds increases the competition among species for resources. In many situations non-native weeds can out-compete native plants and displace them, disrupting the ecosystem.

A Noxious Weed Control Plan will be prepared and submitted to the BLM for review and approval before construction begins. This plan will follow the Las Vegas Field Office's Resource Management Plan (BLM, 1998), *Noxious Weed Plan* (BLM, 2006), and the interagency guidance *Partners Against Weeds* (BLM, 2007) for an active integrated weed management program using weed control best management practices (BMPs).

The following are project-specific measures that NextLight will implement to control noxious weeds:

- **Noxious Weed Risk Assessment Form—**This form provides information about the types of weed surveys to be conducted, and weed treatment and prevention method schedules appropriate for the types of noxious weeds likely to be present. This form identifies and evaluates the level of noxious weed management necessary.
- **Herbicide Use Proposal—**The project proponent shall prepare, submit, obtain and maintain a herbicide use proposal for the proposed action. NextLight will coordinate weed control activities with the BLM Weed Coordinator, particularly regarding proposed herbicide treatments.
- **Weed Management Plan—**Before ground-disturbing activities begin, NextLight will prepare a weed management plan. The plan will identify potential weed infestations at the Project site and along the Project-associated linear facilities and will prescribe treatment.
- **Weed Infestation Prevention—**NextLight will limit ground disturbance to the minimum necessary to safely construct and operate the Project. NextLight will avoid creating soil conditions that promote weed germination and establishment.
- **Equipment Cleaning Sites—**NextLight will establish equipment-cleaning sites to remove weed seeds, plant parts, or mud and dirt from vehicles. Project-related equipment and machinery will be cleaned using compressed air or water to remove mud, dirt and plant parts before moving into and from relatively weed-free areas. Seeds and plant parts will be collected, bagged, and deposited in dumpsters destined for local landfills, when practical.

The following measures would be implemented to prevent infestations of noxious weeds at the Project site and to control any potential infestations that may occur during project construction and operation:

- Project construction workers will inspect, remove, and dispose of weed seed and plant parts found on their clothing and personal equipment, bag the product, and dispose of in a dumpster for deposit in local landfills. Disposal methods may vary depending on the project.
- Certified weed-free hay bales will be used for erosion control and to contain vehicle station wash water
- Periodic monitoring of the construction site will be conducted to check for noxious weed infestations
- Areas subject to construction, such as the transmission right-of-way, will be rehabilitated and revegetated in accordance with the Rehabilitation Plan (see Section 3.13.4 of this BA and also see Attachment 1, POD Section 2.13.4).

3.6 Site Clearing, Grading, and Excavation

The project will require a positive natural terrain slope of less than 5 percent (existing slope varies from 3.0 to 4.5 percent from east to west). Project development plans will strive to minimize the amount of grading and earthwork necessary to construct and operate the Project. Some grading is required for installation of major structures such as the O&M building, substations and switchyard, and drainage controls. Road and access way development will require grading; however, within the solar field grading activities will occur only where necessary for foundation installation, trenching, and access ways. Trenching will be required for placement of electric lines within the solar field (see Section 2.8, Solar Array Assembly and Construction, for a discussion of trenching). Grading and excavation requirements are described for each of the primary project components below.

Solar Field. Within the solar field, some grading will be required for roads and access ways between the 1MW blocks, and for electrical equipment pads. In general, the design standard for the roads and access ways within the solar field will be consistent with the amount and type of use they will receive. The paved Maintenance Road that travels from the O&M area across the center of the site will be designed to accommodate speeds up to 35 mph, although recommended posted speeds will be between 20 to 25 mph.

The Perimeter Road will be an all weather aggregate surface. This road will generally follow existing perimeter contours. The aggregate Perimeter Road will require approximately 48,800 tons of aggregate in total. The aggregate will be Nevada DOT Class 2 Type A aggregate base. The material is a well grade aggregate with a range from 1" to the #200 sieve.

Within the 1MW blocks the amount of the grading will be minimal when the panel support foundations are driven or drilled. For locations where driven or drilled foundations are not feasible, ballast foundation systems will be required. The elevation difference between any two ballast supported panels must be less than 5 percent in the east-west direction for

proper installation and operation of the drive motors and support systems. In some situations, pads may need to be created to maintain the required tolerances. Grading will also be required within each 1MW block to accommodate a level concrete pad to support the inverter and transformer.

Substations and Switchyard. The substations and switchyard (in total, 8.2 acres) require a graded site to create a relatively flat surface for proper operation, with approximately 1percent maximum slope in either direction. The existing ground surface slope at these locations ranges between 3 to 4.5 percent. The substation and switchyard interiors will be covered with aggregate surfacing for safe operation. The substations and switchyard will require approximately 10,000 tons of aggregate rock in total. The aggregate will be Nevada DOT washed Number 4 concrete aggregate. The material is a uniformly grade aggregate with a range from 1 1/2" to 3/8".

O&M Area. O&M area grading will include the area where the O&M building will be constructed. The remaining area will be graded and appropriately surfaced for parking, roads, material storage and the erection of a temporary assembly structure for use during the construction phase of the Project.

A temporary lined pond, 140 feet by 200 feet, will be excavated near the well field to allow water trucks to draft water during the construction phase of the Project. The pond area will be restored to grade at the completion of the construction phase.

Graded pads for two permanent water storage tanks will be installed at the well field to provide fire water and to provide storage to meet the Project's operational needs.

Drainage Control Structures. Earthwork will be required to protect the site from major stormwater events. The required facilities include a series of berms to control surface flows to existing stormwater flow corridors across the site. Construction of these facilities will require excavation and grading. The estimated area of displaced by these structures is 17.7 acres. An additional area, estimated at 11 acres will be disturbed during construction of structures. Native material will be used to construct the berms. A revegetation plan will be implemented following construction to reduce visual effects and erosion impacts potentially associated with construction of these facilities.

Exterior Fire Break. A 20-foot-wide fire break will be constructed outside the Project perimeter fence. The fire break will follow existing contours. The purpose of the fire break is to remove vegetation to prevent the spread of wildfire to the Project site. Creation of the fire break will require removal of shrubs and bushes. It is anticipated that the firebreak will be scraped with a grader or disc periodically to reduce vegetation. A fire break will not be established along the stormwater flow corridors.

Project Roads. The Project roads are discussed in Section 2.2.4.6 and Section 3.2.

Water Well Construction. The Project water wells will be constructed using standard well drilling techniques to a depth of approximately 600 feet. Well design will be finalized based on estimated groundwater characteristics and potential aquifer yield.

3.7 Solar Array Assembly and Construction

Solar field construction work will require a pre-assembly area on the Project site. The assembled solar equipment will be installed on the pre-cast concrete foundations or embedded piers to form a row of panels. If tracking technology is used, these rows will be attached to an aboveground driveshaft. Specialty trucks will be used to transport the assembled PV modules to the solar field. A small mobile crane will be used for setting the solar modules on the pre-cast ballast or embedded pier foundations. Trenching machines will be used for base trenching, light skiploaders for backfill, and light rollers for compaction. Final solar field assembly will require small cranes, tractors, welding machines, and forklifts.

Cable trenches will be used to provide underground connection of Project equipment. Trenches will contain electrical conductors for power generation and fiber optic cables for equipment communication. Trenches will vary between 2 to 3 feet wide and 2 to 3 feet deep depending on the number of conductors and voltage of equipment to comply with applicable electrical codes. Table 3-5 provides a summary of trenching requirements for each design option and trench locations are shown in Attachment 1 (POD Figures 1-5, 1-7, and 1-9).

TABLE 3-5
Length and Area of Trenching Required for Each PV Technology

	Project Total		Acres (total)
Technology	2 ft wide x 3 ft deep	3 ft wide x 3 ft deep	
Tilted Tracker	135,050 ft	138,700 ft	15.8
Horizontal Tracker	256,595 ft	138,700 ft	21.3
Fixed Tilt	153,300 ft	138,700 ft	16.6

Prior to trench excavation, the area to be trenched will be graded and organic matter removed. Organic matter will be mulched and re-deposited within the site fill except under foundations and in trenches. Trench excavation will be performed with conventional trenching equipment. Excavated soil will be maintained adjacent to the trench and used to backfill the trench once conductors are installed and tested. Excavated soil will not be removed from the Project site. Temporary sheeting or bracing shall be used as necessary to support trench side walls in areas where soils are soft or collapsible.

The trench itself will be first backfilled with 3 to 4 inches of sand to provide suitable bedding for installed conductors, and then 3 to 4 inches of sand will be deposited on top of installed conductors. The remaining backfill will be composed of the native excavated soils and compacted to 90 percent of standard proctor density. During the backfill, underground utility marking tape will be installed 12 inches below grade to indicate the type of conductors installed beneath.

3.8 Construction Waste Management

During construction, the primary waste generated will be nonhazardous solid waste. However, some nonhazardous liquid waste and hazardous waste (solid and liquid) will also be generated. All of the hazardous wastes will be generated at the plant site. The types of waste and their estimated quantities are described in the following discussion. Typical wastes generated during construction are identified in Attachment 1 (POD Table 2-6). NextLight will prepare a Waste Management Plan that will describe the storage, transportation, and handling of wastes and will emphasize the recycling of construction wastes where possible and will identify the specific landfills that will receive construction wastes that cannot be recycled. Construction wastes will be managed in accordance with the Resource Conservation and Recovery Act (RCRA) (42 USC 6901, et seq. and RCRA's implementing regulations at 40 CFR 260, et seq.) and other applicable state and local regulations.

3.8.1 Nonhazardous Solid Waste

The following nonhazardous waste streams potentially could be generated from construction of the Project:

- **Paper, wood, glass, and plastics.** During construction, approximately 200 tons of paper, wood, glass, and plastics will be generated from packing materials, waste lumber, insulation, and empty nonhazardous chemical containers. These wastes will be recycled to the extent practical. Waste that cannot be recycled will be disposed of weekly in a municipal landfill. On site, the waste will be placed in dumpsters.
- **Metal.** Approximately 2 tons of metal including steel (from welding and cutting operations, packing materials, and empty nonhazardous chemical containers) and aluminum waste (from packing materials and electrical wiring) will be generated during construction. Waste will be recycled where practical. All wastes that that cannot be recycled (empty hazardous materials containers, spent welding materials, waste oil) will be deposited in a municipal landfill.

Landfills located nearest the Project site include the Boulder City Landfill in Boulder City (Class I Municipal Solid Waste) and Wells Cargo Landfill in Las Vegas (Class III Industrial Waste).

3.8.2 Wastewater

Wastewater generated during construction will include sanitary waste, stormwater runoff, equipment washdown water and water from excavation dewatering during construction (if dewatering is required). These wastewaters may be classified as hazardous or nonhazardous depending on their chemical quality and handled and disposed of in accordance with applicable law.

3.8.3 Hazardous Waste

A small amount of hazardous waste will be generated during construction primarily from small petroleum spills resulting from the operation of heavy equipment and filling of transformer and hydraulic equipment reservoirs. These spills will be cleaned up when they

occur and the resultant waste material properly disposed in accordance with federal and state regulations.

Most of the hazardous waste generated during construction will consist of liquid waste, such as water from excavation dewatering (if it contains contaminants), flushing and cleaning fluids, passivating fluid (to prepare pipes for use), and solvents. Some hazardous solid waste, such as welding materials and dried paint, may also be generated during construction.

When pipes are cleaned and flushed, waste liquid will be generated. The volume of flushing and cleaning liquid waste generated is estimated to be one to two times the internal volume of the pipes cleaned. The quantity of welding, solvent, and paint waste is expected to be minimal. Wastewaters generated during construction could also be considered hazardous, based on sampling. A SPCC plan will be developed in accordance with federal regulations to protect the environment from spills of petroleum products.

3.9 Gravel, Aggregate, and Concrete Needs and Sources

Concrete ballasts, if used, and pads to support the PV panels and tracker units will be pre-cast and delivered to the site or constructed on site. A small amount of concrete will be poured in place for equipment and building foundations, fence footing and miscellaneous small pads. Aggregate material will be used for the parking lot, substation, switchyard areas and Perimeter Road. An estimated 60,000 tons of aggregate material will be required for construction of the Perimeter Road and surfacing of the substation and switchyard areas. This aggregate will be procured from off-site locations and trucked to the Project site. Concrete will be supplied to the site from a commercial source or an onsite batch plant.

Concrete, mechanical, and electrical works will be performed over a period of 48 months, with the aid of graders, rollers, front loaders, dump trucks, trenching machines, concrete mixer and pump trucks, cranes, and pick-ups.

The drainage control berms to be constructed to reinforce the stormwater flow corridors will require rock reinforcement. Appropriate sized rock that will be used to minimize erosion would be obtained from onsite grading operations, to the maximum extent possible. By placing a 2-foot thick layer of rock on the wash side of the berm, approximately 25,000 cubic yards of rock material would be required. It is anticipated that a majority of rock material would be obtained from an offsite rock quarry. Rock material obtained from offsite sources would be of a similar color as the onsite rock material. A BLM approved material, such as Permeon, may be applied to the rock surface to assist with weathering and blending of the berm's appearance with the surrounding area. Along the interior washes, vegetation will be re-planted on the southern berm of each wash where it will not cause shading of the solar array.

3.10 Electrical Construction Activities

Electrical construction will include installation of electrical equipment and necessary infrastructure to energize the equipment. Construction areas will include the project solar field and interconnecting transmission lines.

Electrical construction will consist primarily of the following elements:

- **Equipment**—Installation of all electrical equipment including transformers, MCCs, circuit breakers, disconnect switches, switchgear and distribution panels, lighting, communication, control, and SCADA equipment.
- **Cables**—Installation of all cables necessary to energize the project equipment including instrument control wiring. High, medium, and low voltage cables will be routed via cable trays, abovegrade conduits, belowgrade conduit in duct bank, and overhead transmission structures as necessary.
- **Grounding**—All equipment and structures will be grounded as necessary. Within the solar field, an appropriate grounding system will be engineered and constructed in order to maintain personnel safety and equipment protection.
- **Telecommunications**—Multiple communication systems will be required for the Project to properly operate, including T-1 internet cables, fiber optic, and telephone. All communications will be installed during electrical construction.

Transmission lines at the site will include underground and overhead 34.5kV lines and overhead 220kV/230kV lines. The transmission line interconnection details are detailed further in Section 3.1 of this document. Transmission line characteristics and construction techniques are briefly summarized below, and standard construction techniques that will be implemented also are provided.

3.10.1 34.5kV Transmission Lines

The 34.5kV output from each medium voltage transformer will be "daisy-chained" together using underground trenched conductors. "Daisy-chain" refers to the manner in which the transformers are electrically connected together on the 34.5kV side. Transformers for this application are ordered as loop-feed transformers meaning that they have two (2) sets of medium-voltage bushings. Each transformer will connect to the transformers from adjacent blocks (using buried conductors in the trenches specified in Attachment 1, Figures 1-5, 1-7, and 1-9), except for the last transformer in each circuit which only connects to one other transformer. Each underground circuit will collect up to 30MW of transformers in this configuration before transitioning to overhead conductors. At the underground-overhead transition, a pole-mounted visible disconnect switch is utilized to isolate conductors for service.

Overhead 34.5kV lines will be installed as double circuit lines on wood poles with post insulators (typical of medium voltage installations in electric distribution systems). Pole height will be 45 feet above grade. Spacing between individual circuits and phases will comply with National Electrical Safety Code requirements, typically 5 feet. A 23-foot ground clearance will be maintained under 34.5kV lines based on the highest expected temperature and loading. A total of 192 wood poles will be installed with 150-foot spacing between poles. Wood poles will be directly embedded to 10 percent of the pole height plus 2 feet, typically 8 feet deep. A ground rod of 8 to 12 feet will be hammered into the ground adjacent to the wood pole.

3.10.2 220kV/230kV Transmission Lines

The Project will use 220kV/230kV transmission lines for interconnection to the electric power system. Overhead 220kV/230kV transmission lines will be installed on steel monopole structures of approximately 90 feet above grade with 15 foot spacing between conductors and minimum ground clearance of 26 feet per local and national electrical code requirements. A total of 22 steel poles will be installed with 800-foot spacing between poles. Steel poles are galvanized steel with a dull gray appearance similar to existing steel poles installed adjacent to the Project or color treated.

3.10.3 Standard Transmission Line Construction Techniques

Standard transmission line construction techniques will be used to construct the 220kV/230kV transmission lines and the 34.5kV collector lines. Primary stages in transmission line construction are foundation installation, pole installation, and conductor stringing. These stages are briefly described below for each of the transmission line types that will be installed at the site.

Foundation Installation. The 220kV/230kV steel monopoles will be supported by steel-reinforced poured pier concrete foundations which are suitable for the sandy soils conditions at the site. These foundations are constructed by auguring a cylindrical hole using a truck-mounted drilling rig. Reinforcing steel and anchor bolt cages will be installed in the hole and then the hole will be backfilled with concrete. Steel monopole foundations will range in size from approximately 4 to 7 feet in diameter, and range in depth from 12 to 30 feet. Larger diameter and deeper foundations will be located where the transmission line turns at an angle of 30 degrees or greater.

Wood poles will be embedded into the ground to a depth of at least 10 percent of the pole height plus 2 feet. For the Project installation of wood poles is anticipated to require auguring holes approximately 2 feet in diameter and 8 feet deep. Aggregate or high-strength backfill will be used to stabilize the installed poles. One foundation hole for each transmission line structure and directly embedded pole is expected.

Pole Installation. Poles will be staged either in a designated laydown/stringing area, or they may be delivered and unloaded adjacent to their respective final locations.

Poles will be placed onto their foundations (for wood, placed into their holes) using backhoes or heavy lifter vehicles for the smaller, lighter poles, or a crane for longer poles. The poles will be supported, as necessary, during backfilling or bolting to the foundation to ensure correct pole seating and raking. Taller steel poles, typically those that are over 45 feet long, will be composed of multiple sections that will be stacked on each other and then "jacked" together (aligning the boltings on each pole so that they can be properly fastened).

For dead-end wood poles or turning poles, guys and anchors will be installed with auger trucks placing the anchors. Wood pole dead-ends for a double circuit will possibly be two independent poles, two poles lashed together with guys, or more simply, a steel pole on a drilled pier foundation with davit arms designed to hold the tension of a double circuit.

Conductor Stringing. Conductor stringing will likely be conducted one phase at a time, with all equipment in the same operational place until all phases of that operation are strung. The sequence of conductor stringing operations is summarized below.

- Finger Lines: The finger line is used to pull the later pilot line through travelers installed on each davit arm. The finger line is typically a small diameter synthetic rope that can be pulled by hand or crawler tractor.
- Pilot Lines: The finger line, once in place, is used to pull the pilot line which is a larger synthetic rope or small steel line. This requires a vehicle at each side of the pulling area, a Bullwheel tensioner truck doing the pulling of the pilot line, and a drum puller truck on the other side holding the reel.
- Conductor: Using the pilot line, the conductor is pulled through. Other activities may include offset clipping if suspension insulators are not plumb, or splicing together two reels of conductor. Once complete, the traveler equipment will be removed.
- Tensioning: After the conductor is completely strung through a section, the section is tensioned to comply with design specifications. Once the conductor has been tensioned or loosened to meet the appropriate sag specification given the ambient temperature, the dead-end clamps will be tightened.

Grounding. Ground rods will be hammered into the earth with a jackhammer device attached to a small excavator (such as a Bobcat). Typically, the rods are 8 to 12 feet long and can be longer if needed by joining multiple rods. For the 34.5kV wood poles, a 3-foot square by 2-foot-deep area will be excavated to expose the ground rod for connection to the plant's grounding grid. The poles can then be connected by laying in ground wire below grade to connect to the ground grid via trenching. Ground rods can be connected to the pole or in the case of the steel pole, to the anchor bolts. The 220kV/230kV poles may be connected to the overall plant ground grid or remain independent.

It is expected that an area of approximately 100 feet by 150 feet will be required at each 220kV/230kV pole location for use as temporary laydown or as a staging area for equipment, poles, and hardware. In general, little to no grading is expected to be required for these areas.

Typical equipment expected to be used for transmission line construction includes: (1) backhoe, (2) truck-mounted pole hole auger, (3) forklift, (4) crane, (5) line truck with air compressor, (6) various pickup and flatbed trucks, (7) conductor reel and pole trailers, (8) bucket trucks, and (9) truck-mounted tensioner and puller.

Switchyard construction will consist of site grading, concrete equipment foundation forming and pouring, crane-placed electrical and structural equipment, underground and overhead cabling and cable termination, ground grid trenching and termination, control building erection, and installation of all associated systems including, but not limited to HVAC, distribution panels, lighting, communication and control equipment, and lightening protection.

3.11 Aviation Lighting

The nearest existing airport, the Jean Airport (OL7), is approximately 9 miles north of the Project site. The Project is exempt from filing Federal Aviation Administration (FAA) Form 7460 (Notice of Proposed Construction or Alteration) for compliance with the FAA's

regulations at 14 CFR Part 77 for the Jean Airport because the Project is more than 20,000 feet from the existing runways. However, the southern end of the nearest runway planned for the proposed Southern Nevada Supplemental Airport is approximately 11,000 feet from the northern Project boundary. Because of the proximity to the proposed airport, NextLight may be required to file Notices of Proposed Construction or Alternation (Form 7460s) with the FAA. NextLight will file any necessary notices prior to Project construction as may be required by the FAA. The FAA review process will identify any aviation-related lighting requirements. The tallest structures at the site will be the 90-foot-high transmission towers.

3.12 Site Stabilization, Protection, and Reclamation Practices

3.12.1 Erosion and Sediment Control Measures

Because of the large amount of soil and vegetation that will be removed or disturbed during construction, appropriate water erosion and dust-control measures will be required to prevent an increased dust and sediment load to ephemeral washes around the construction site. Except for cactus and yucca species protected by Nevada state law, no cleared vegetation will leave the site. It will be mulched or composted on site to assist in erosion control and limit waste disposal. In some areas to be graded that lie outside of the solar field, native vegetation may be harvested for replanting to augment soil stabilization. Cactus and yucca removal will meet salvage requirements established by the State. Plants will be made available for commercial and public use.

Soil stabilization measures will be used to prevent soil being detached by stormwater runoff. NextLight will employ BMPs to protect the soil surface by covering or binding soil particles. The Project will incorporate erosion-control measures required by regulatory agency permits and contract documents as well as other measures selected by the contractor. Site-specific BMPs will be designed by the contractor, and associated figures are to be included in the final Project SWPPP. At a minimum, the Project will implement the following practices for temporary and final erosion control:

Year-round:

- Monitor the weather using National Weather Service reports to track conditions and alert crews to the onset of rainfall events.
- Preserve existing vegetation where required and when feasible. Conduct clearing and grading only in areas necessary for project activities and equipment traffic. Install temporary fencing prior to construction along the boundaries of the construction zone to clearly mark this zone, preventing vehicles or personnel from straying onto adjacent offsite habitat.
- Sequence construction activities with the installation of erosion control and sediment control measures. Arrange the construction schedule as much as practicable to leave existing vegetation undisturbed until immediately prior to grading.
- Protect slopes susceptible to erosion by installing controls such as hay bales, fiber rolls, and gravel bags.

- Stabilize non-active areas as soon as feasible after construction is complete and no later than 14 days after construction in that portion of the site has temporarily or permanently ceased. Reapply as necessary to maintain effectiveness.
- Place covers over stockpiles prior to forecasted storm events and during windy conditions. Place sediment controls (fiber rolls or gravel bags) around the perimeter of stockpiled materials year-round. Excess sand and gravel will be stockpiled for BLM material sale.

Maintain sufficient erosion control materials on site to allow implementation in conformance with General Permit requirements and as described in the SWPPP. This includes implementation requirements for active areas and non-active areas that require deployment before the onset of rain.

- Promptly repair and reapply controls according to BMPs in areas for which erosion is evident.

During the rainy season:

- Implement temporary erosion control measures such as fiber rolls, straw bales, geotextiles and mats, and gravel bags at regular intervals throughout the defined rainy season and as needed determined by site conditions.
- Inspect and stabilize disturbed areas with temporary or permanent erosion control measures before rain events.

During the non-rainy season:

- Conduct construction activities that will have an impact on waters of the United States during the dry season to the extent feasible to minimize erosion.

A combination of the following erosion controls may be used at the site:

- Scheduling of activities to avoid times of erosion susceptibility
- Preservation of existing vegetation
- Mulch and hydraulic mulch
- Straw mulch
- Geotextiles and mats
- Earth dikes and drainage swales
- Velocity dissipation devices
- Slope drains
- Streambank stabilization

BMPs will be deployed in a sequence to follow the progress of grading and construction. As the locations of soil disturbance change, erosion controls will be adjusted accordingly to control stormwater runoff at the downgrade perimeter.

3.12.2 Sediment Control Measures

Sediment controls are intended to complement and enhance selected erosion control measures and reduce sediment discharges from active construction areas. Sediment controls are designed to intercept and settle out soil particles that have been detached and

transported by the force of water. The Project will incorporate sediment control measures required by regulatory agency permits and contract documents as well as other measures selected by the contractor. The Project will implement the following practices for temporary sediment control:

Year-round:

- The installation of detention ponds to control all stormwater flow off site. The ponds will be designed to control sediment transport off site. Sediment will be removed from the ponds periodically and transported off site to a designated fill area.
- Maintain the following temporary sediment control materials onsite: silt fence materials, gravel bags for linear barriers, and fiber rolls in sufficient quantities throughout the project to implement temporary sediment controls in the event of predicted rain and to respond to failures or emergencies, in conformance with General Permit requirements and as described in the SWPPP. Install gravel filter berms at the base of slopes adjacent to delineated sensitive areas (wetlands, dry washes), if any. Native onsite stones/rocks will be used in construction of gravel filter berms or check dams.
- Install gravel filter berms along the boundaries of delineated sensitive areas, if any, within the boundaries of the Project site or areas that receive runoff from the Project site. Native onsite stones/rocks will be used in construction of gravel filter berms or check dams.

During the rainy season:

- Implement temporary sediment controls at the draining perimeter of disturbed soil areas, at the toe of slopes, and at outfall areas.

During the non-rainy season:

- Implement temporary sediment controls such as hay bales, fiber rolls, or gravel bags at the draining perimeter of disturbed soil areas.

A combination of the following sediment controls may be used at the site:

- Silt fence
- Sediment basin
- Sediment trap
- Check dam
- Fiber rolls
- Gravel bag berm
- Street sweeping and vacuuming

BMPs will be deployed in a sequence to follow the progress of grading and construction. As the locations of soil disturbance change, sedimentation controls will be adjusted accordingly to control stormwater runoff at the downgrade perimeter.

3.12.3 Dust Control

NextLight will use water to control dust to comply with Clark County dust control requirements. Where water is insufficient to control dust, soil stabilizers approved by BLM and USFWS, will be used within the fenced solar field to control dust to County standards.

3.12.4 Rehabilitation and Decommissioning Plans

NextLight will develop a Site Rehabilitation Plan for the revegetation and rehabilitation of areas disturbed by the Project. This plan will be implemented immediately after construction for the areas that are temporarily disturbed, such as portions of the transmission line route that involve disturbance.

The Project facilities have an expected life of 50 years or more and the Site Rehabilitation Plan will include plans for the restoration of the Project site assuming the cessation of operation and eventual removal (see Decommissioning Plan below). The Site Rehabilitation Plan will cover the following topics:

- Goals and objectives of the plan
- Methods to be used to achieve site rehabilitation
- Criteria to be used to determine the success or failure of the rehabilitation
- Monitoring and maintenance of the site during and periodically after rehabilitation
- Noxious weed control during rehabilitation
- Annual reporting
- Rehabilitation implementation and monitoring schedule

3.12.4.1 Decommissioning Plan

In order to ensure that the permanent closure of the facility does not have an adverse effect, a Facility Decommissioning Plan will be developed at least 6 months prior to commencement of site closure activities. The Facility Decommissioning Plan will be developed in coordination with the BLM, with input from other agencies as appropriate. The Facility Decommissioning Plan will address future land use plans, removal of hazardous materials, impacts and mitigation associated with closure activities, schedule of closure activities, equipment to remain on the site, and conformance of the plan with applicable regulatory requirements and resource plans. The Decommissioning Plan will be consistent with requirements and goals set for in the Rehabilitation Plan.

The activities involved in the facility closure will depend on the expected future use of the site. Certain facility equipment may be utilized for future uses of the site, such the operations and maintenance building, electrical transmission lines, and roads. Therefore, the extent of site closure activities will be determined at the time of the closure, in accordance with a Decommissioning Plan.

Closure activities may include:

- Removal of solar panels and supports
- Removal of foundations
- Removal of underground facilities to a depth of at least two feet below the ground surface

- Removal of inverters and transformers
- Removal of the substation
- Disposal of chemicals and hazardous waste
- Draining of transformers and disposal of dielectric oils (if transformers cannot be resold)
- Demolition and removal of the operations and maintenance building and removal of building foundations
- Removal of on-site wooden transmission poles and conductors
- Removal of 220kV/230kV steel transmission poles and conductors, and removal of foundations to a depth of at least 2 feet below the ground surface
- Closure and abandonment of water wells and septic tank
- Removal of site fencing
- Regrading and restoration of original site contours
- Revegetation of areas disturbed by closure activities in accordance with the Rehabilitation Plan

3.13 Construction Water Usage

Construction activities are expected to take place over a period of approximately 48 months. Water requirements for construction activities will be met by an on-site well. A temporary lined pond, 140 feet by 200 feet, will be excavated near the water supply well to allow water trucks to draft water for use at the site during construction. Upon completion of construction the basin can be removed.

The total construction water requirement for the Project is estimated to be 600 acre-feet during the 4-year construction period, or an average water requirement of 150 acre-feet per year. The maximum volume of construction water in any given year is not expected to exceed 200 acre-feet. The primary use of the water will be for dust control.

3.14 Operation and Maintenance Needs

The operation and maintenance of the solar PV plant will require up to 15 full-time personnel, consisting of plant operators, maintenance technicians, and site security. Staff will be present on site 24-hours per day. Maintenance and administrative staff typically work 8-hour days, Monday through Friday. During periods when non-routine maintenance or major repairs are in progress, the maintenance force will typically work longer hours.

3.15 Maintenance Activities

Prior to project financing and commencement of construction, long-term maintenance schedules will be developed to include periodic maintenance and overhauls in accordance with manufacturer recommendations. Solar PV module replacement rates are anticipated to be less than 0.5 percent per year, on average.

At this time it is assumed that periodic routine maintenance will consist of monthly, quarterly, semi-annual and annual inspections and service. There are very few moving parts in a solar PV project and no process water, gas or fuels are required for the power generation process. This results in a maintenance protocol mainly composed of routine inspections. The frequency and type of maintenance is described below by equipment type. During the first year of operation, the frequency of inspections will be increased to address settling and electrical termination torque (e.g., for year 1, inspections shown as semi-annually are performed quarterly, inspections shown as annual are performed semi-annually).

Periodic routine maintenance comprises monthly, quarterly, semi-annual and annual inspections and service. A solar PV project has very few moving parts, and no process water, gas, or fuels are required for the power generation process. Therefore, the maintenance protocol is mainly routine inspections. The frequency and type of maintenance is described below by equipment type. During the first year of operation, the frequency of inspections will be increased to address settling and electrical termination torque (e.g., for year 1, inspections shown as semi-annually are performed quarterly, inspections shown as annual are performed semi-annually). Routine maintenance procedures are listed in Table 3-6.

TABLE 3-6
Routine Maintenance Protocol

Equipment	Maintenance Interval	Task
PV Modules	Quarterly	• Visually inspect panels for breakage and secure mounting • Visually inspect modules for discoloration • Visually inspect wiring for connections and secure mounting • Visually inspect mounting structure for rust and erosion around foundations • Manually clean localized debris from bird droppings, etc.
	Semi-Annually	• Clean modules
Inverters	Semi-annually	• Perform temperature checks on breakers and electrical terminations • Visual inspection of all major components and wiring harnesses for discoloration or damage • Measure all low voltage power supply levels • Inspect/remove any dust/debris inside cabinet • Inspect door seals • Check proper fan operation • Inspect (replace if necessary) filters • Check electrical termination torque • Check all fuses • Check the operation of all safety devices (e-stop, door switches, ground fault detection)

TABLE 3-6
Routine Maintenance Protocol

Equipment	Maintenance Interval	Task
Inverters, cont.	Annually	• Check all nuts, bolts and connections for torque and heat discoloration • Calibrate control board and sensors • Inspect air conditioning units for proper operation
Medium voltage transformers	Semi-annually	• Perform temperature check • Inspect door seals • Record all gauge readings • Clean any dirt/debris from low voltage compartment
Substation transformers	Semi-annually	• Inspect access doors/seals • Inspect electronics enclosure and sensor wiring • Record all gauge readings
	Annually	• Inspect fans for proper operation • Calibrate temperature and pressure sensors
Breakers and switchgear	Semi-annually	• Inspect for discoloration of equipment and terminations • Inspect door seals
	Annually	• Check open/close operation
Overhead transmission lines	Annually (and after heavy rains)	• Inspect guy wires and pole angle • Visual inspection of supports/insulators • Visual inspection for discoloration at terminations
Roadways	Annually (and after heavy rain)	• Inspect access ways and roads that cross drainage paths for erosion
Vegetation	Semi-annually	• Inspect for localized vegetation control to restrict height to less than 12 inches to address faster growth vegetation
	Every 3 years	• Mowing as required to reduce vegetation height to 9 inches
Water Wells	Annually	• Visual inspection • Pressure test
O&M Building	Semi-annually	• Check smoke detectors
	Annually	• Check weather stripping and door/window operation • Check emergency lighting • Inspect electrical service panel
Fencing	Annually (and after heavy rain)	• Inspect fence or vandalism and erosion at base

Routine cleaning of the PV modules is required to minimize performance degradation at a level below 3 percent. As noted above, it is anticipated that the panels will require washing once or twice a year.

No heavy equipment will be used during normal plant operation. Operation and maintenance vehicles will include trucks for onsite welding, lubricating, and panel washing. In addition, pick-up trucks will be in daily use on the site.

3.16 Operations Workforce and Equipment

The Project will require a workforce of up to 15 full-time equivalent (FTE) positions. This workforce will include administrative and management personnel, operators, and security and maintenance personnel. This workforce will be based at the O&M building. Employees will be onsite to maintain equipment and provide security. Operation and maintenance will require the use of vehicles and equipment including trucks for onsite welding and PV panel washing.

Operation and maintenance will require the use of vehicles and equipment including trucks for onsite welding, re-fueling, lubricating, panel washing and crane trucks for minor equipment maintenance. Additional maintenance equipment will include forklifts, manlifts, and chemical application equipment for weed abatement and soil stabilizer treatment in the bioremediation area. Flatbed trucks, dump trucks, and pick-up trucks will be in daily use on the site.

At designated intervals, approximately every 10 to 15 years, major equipment maintenance will be performed. On occasions, large heavy-haul transport equipment, including overhead cranes, will be brought on site. No heavy equipment will be used during normal plant operation.

3.17 Emergency Response Planning

An emergency response plan will be prepared for the Project. The plan will contain a section that presents the results of a comprehensive facility hazard analysis and, for each identified hazard, a response plan. Emergencies may include brush or equipment fires, transformer oil leaks or spills, attempted acts of sabotage, and airplane crashes. The emergency response plan will assign roles and actions for onsite personnel and responders and will designate assembly areas and response actions.

SECTION 4

Minimization Measures

The following subsection describes the measures proposed by NextLight to avoid and minimize the potential adverse effects to the desert tortoise resulting from the Project construction, operation, and maintenance. An overriding objective of these measures is to reduce or eliminate lethal take of desert tortoises and limit disturbance to desert tortoise habitat to the maximum extent possible. For reference, Section 9 of the ESA, and federal regulation pursuant to Section 4(d) of the ESA, prohibit the take of endangered and threatened species, respectively, without special exemption. **Take** is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. **Harm** is further defined by USFWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. **Harass** is defined by USFWS as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include but are not limited to breeding, feeding, or sheltering. **Incidental take** is defined as take that is incidental to and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to and intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of the incidental take statement.

The primary strategy for eliminating lethal take is to secure the boundary of construction areas with tortoise exclusionary fencing; either permanent or temporary. The solar field and support facilities would be secured with a permanent chain-link, metal-fabric security fence with attached desert tortoise exclusionary fencing. All desert tortoises currently occupying the solar field and support facilities would be relocated to an area outside of the fenced areas as specified by an approved relocation/translocation plan and the terms and conditions of the Biological Opinion. While the relocation/translocation activity would still result in take in the form of harassment, the objective in relocating tortoises would be to reduce or eliminate mortality during construction Other measures focus on reducing the potential from all forms of take during construction, operation, and maintenance activities; primarily those activities occurring outside of the perimeter fence of the solar field.

4.1 Construction Minimization Measures

This section lists measures intended to minimize take of desert tortoise that would be implemented during construction.

1. Authorized biologists would conduct activities including locating desert tortoises and their sign (i.e., conduct presence/absence and clearance surveys) and attempting to ensure that the effects of the project on the desert tortoise and its habitat are minimized in accordance with the measures stated in this BA and the terms and conditions of the biological opinion. Authorized biologists would keep current with the latest information

on USFWS protocols and guidelines. An authorized biologist will have thorough and current knowledge of desert tortoise behavior, natural history, and ecology, physiology, and will have demonstrated substantial field experience and training to safely and successfully:

- Handle and temporarily hold desert tortoises
- Excavate burrows to locate desert tortoise or eggs
- Relocate desert tortoises
- Reconstruct desert tortoise burrows
- Unearth and relocate desert tortoise eggs
- Locate, identify, and record all forms of desert tortoise sign

NextLight would obtain approval of authorized biologists from USFWS for individuals who have the appropriate qualifications.

2. Desert tortoise monitors would oversee all project construction activities with the potential to affect the desert tortoise. Desert tortoise monitors would provide oversight to ensure proper implementation of protective measures, record and report desert tortoise and tortoise sign observations in accordance with approved protocol, report incidents of noncompliance in accordance with the biological opinion and other relevant permits, and move desert tortoises from harm's way and place the animals in "safe areas" pre-selected by authorized biologists or maintain the desert tortoises in their immediate possession until an authorized biologist assumes care of the animal.

   The desert tortoise monitors will assist the authorized biologists during surveys and often serve as "apprentices" to acquire experience. Desert tortoise monitors would not be authorized to conduct desert tortoise presence/absence or clearance surveys unless directly supervised by an authorized biologist. Directly supervised means the authorized biologist would be in direct voice and sight contact with the desert tortoise monitor.

   Desert tortoise monitors would be individuals who have appropriate qualifications and have been approved by an authorized biologist.

3. A Worker Environmental Awareness Program (WEAP) would be prepared to address the types of construction activities that may affect the desert tortoise. The WEAP would describe the protective measures stipulated in the biological assessment and in the terms and conditions of the biological opinion. Special emphasis would be placed on explaining the protective measures developed for the desert tortoise and the consequences of noncompliance. At a minimum, the program would contain information on physical characteristics, distribution, behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protective measures associated with the desert tortoise. Information provided in a fact sheet developed by BLM entitled "The Threatened Desert Tortoise" would be incorporated into the WEAP. The WEAP would be administered to all onsite personnel including employees, contractors, contractors' employees, supervisors, inspectors, subcontractors, and delivery personnel. The program would be administered onsite by the authorized biologist or desert tortoise monitor. It may include an oral presentation,

video/PowerPoint, and written materials. The WEAP would be approved by the BLM and USFWS.

4. NextLight would designate a field contact representative (FCR) who would be responsible for overseeing compliance with the protective measures. The FCR would be onsite during all activities that may result in the take of the desert tortoise. The FCR would have the authority to halt all activities that are in violation of the desert tortoise protective measures identified in the biological opinion. If the FCR identifies a violation of the desert tortoise protective measures, work would proceed only after corrective measures have been taken. The FCR would have a copy of the biological opinion with them during all construction activities. The FCR may be an authorized biologist, desert tortoise monitor, construction supervisor, or any other employee with the authority to halt construction activity.

5. During construction, NextLight would comply with the *Guidelines for Handling Desert Tortoises during Construction Projects* (Desert Tortoise Council, 1999) or the most current guidelines available.

   (a) The boundaries of all areas to be disturbed (for example, project site, stormwater drainage control features, and linear corridors) would be flagged before beginning any activities, and all disturbances would be confined to the flagged areas. All survey crews on site prior to construction would be escorted by an authorized biologist. All project vehicles and equipment would be confined to the flagged areas. Survey crew vehicles would remain on existing roads. Disturbance beyond the construction zone would be prohibited except to complete a specific task within designated areas or emergency situations.

   (b) NextLight would relocate tortoises currently occupying the area within the solar field following the USFWS-approved protocol (Desert Tortoise Council, 1999). If the Desert Tortoise Council releases a revised protocol for handling desert tortoises before initiation of project activities, the revised protocol would be implemented for the Project. The relocation/translocation effort would adhere to the following procedures as well as those stipulated in the Terms and Conditions of the Biological Opinion.

      (1) NextLight would identify relocation/translocation sites for tortoises relocated from within the solar field and prioritize selection of potential relocation/translocation sites that are located immediately adjacent to the north, east, and west of the Project site subject to approval by the BLM and USFWS.

      (2) The authorized biologist would maintain a record of all desert tortoises encountered and relocated during project surveys and monitoring. This information would include for each individual: the locations (narrative, vegetation type, and maps) and dates of observations; general conditions and health; all apparent injuries and state of healing; if moved, the location from which it was captured and the location in which it was released (whether animals voided their bladders); and diagnostic markings (such as identification numbers, if present).

(3) All burrows with the potential to be occupied by tortoises within the solar field fenced area would be searched for presence. In some cases, a fiber optic scope could be used to determine presence or absence within a deep burrow. Burrows inhabited by tortoises would be excavated using hand tools by authorized biologists or desert tortoise monitors. The biologists or monitors would be supervised by an authorized biologist. To prevent reentry by a tortoise or other wildlife, all burrows would be collapsed after absence has been determined. Tortoises excavated from burrows would be relocated immediately following excavation to unoccupied natural or artificial burrows outside the fenced area. Prior to release, tortoises would have an identification number affixed to the shell with epoxy.

(4) Tortoises within the solar field fenced area would be relocated to unoccupied natural or artificially constructed burrows. Relocated tortoises would be placed in burrows of similar size, shape, and orientation. If an existing burrow similar to the original burrow is not available, the authorized biologist or desert tortoise monitor would construct one. Burrow construction would follow the appropriate protocols outlined in *Guidelines for Handling Desert Tortoise during Construction Projects* (Desert Tortoise Council, 1999).The animals would be transported in clean cardboard boxes. A new box would be used for each individual tortoise and would be properly discarded after a single use. The new burrow would be located at least 300 feet from the outside of a fenced area and would be of similar size, shape and orientation to the original burrow. The new burrow locations would be determined by the authorized biologist. Relocated tortoises would not be placed in existing occupied burrows.

(5) The authorized biologist would wear disposable surgical gloves when handling desert tortoises. A new pair of gloves would be used for each tortoise handled to avoid the transmission of upper respiratory tract disease (URTD). Shell notching would not be performed. All equipment used on the tortoises would be sterilized between each use.

(6) Desert tortoises would be treated in a manner to ensure that they do not overheat, exhibit signs of overheating (gaping, foaming at the mouth, etc.), or are placed in a situation where they cannot maintain surface and core temperatures necessary to their well-being. Desert tortoises would be kept shaded at all times until it is safe to release them. No desert tortoise would be captured, moved, transported, released, or purposefully caused to leave its burrow for any reason when the ambient air temperature is above 95 degrees Fahrenheit (°F) (35°C). Ambient air temperature would be measured in the shade, protected from wind, at a height of 2 inches (5 centimeters) above the ground surface. No desert tortoise would be captured if the ambient air temperature is anticipated to exceed 95°F (35°C) before handling and relocation/translocation can be completed. If the ambient air temperature exceeds 95°F (35°C) during handling or processing, desert tortoises would be kept shaded in an environment that does not exceed 95°F (35°C), and the animals would not be released until ambient air temperature declines to below 95°F (35°C).

(7) To monitor for survivorship and health, for a period of 1 year following their relocation/translocation, the desert tortoises within the relocation/translocation area would be surveyed monthly by the authorized biologist during the periods of activity (spring: March to May, and fall: August to October) and once during the two non-active periods (summer: June to July, and winter: November to February). For the following 2 years, the relocation/translocation area would be surveyed at least once in the spring and once in the fall. The focus of these surveys would be to locate and observe relocated tortoises. An authorized biologist would determine the level of effort and methods needed to locate tortoises. All pertinent information on tortoises observed would be recorded, such as behavior, physical characteristics, health characteristics and any visible signs of URTD, as well as any potential anomalies the individual desert tortoise might display.

6. Tortoise handling, artificial burrow construction, egg handling and other procedures would follow those described in the *Guidelines for Handling Desert Tortoise during Construction Projects* (Desert Tortoise Council, 1999) for all tortoise relocation/translocation.

7. A relocation/translocation plan for desert tortoises would be developed following guidance from the DTRO. This guidance is currently in draft form. All relocation and translocation activities would adhere to this plan as well as the terms and conditions of the Biological Opinion.

8. Prior to the initiation of solar field construction activities of, NextLight would enclose the boundary of a solar field construction area with desert tortoise exclusionary fencing; both permanent and temporary. Permanent chain-link fencing around the perimeter of the solar field would include desert tortoise exclusionary fencing attached to the bottom of the chain link fencing in areas where appropriate to permanently maintain the separation of the solar field and remaining desert tortoise habitat. The design of the permanent desert tortoise exclusionary fencing would follow that specified in Attachment 2. Desert tortoise guards would be installed at the gated entries to prevent desert tortoises from gaining entry. Permanent fencing would prevent tortoises from entering the Project site for the duration of facility operation. The temporary exclusionary fencing of construction areas would consist of galvanized hard wire cloth, silt fencing, or orange construction fencing. The fencing would be buried approximately 6 inches below ground or bent at a right angle toward the outside of the work area and covered with dirt, rocks, or gravel to discourage desert tortoises from digging under the fence. Temporary fencing would prevent tortoises from entering a cleared construction area.

9. The exclusionary fencing of a solar field construction area would be installed prior to the onset of clearing and grubbing. The fence installation would be supervised and monitored under the direction of authorized biologists and desert tortoise monitors. Ongoing maintenance of the fencing would be performed with the oversight of an authorized biologist.

10. Within 24 hours before installing the desert tortoise exclusionary fencing around the boundary of a solar field construction area, a desert tortoise survey would be conducted

using techniques providing 100 percent coverage of the fenced construction area to provide coverage of an area approximately 60 feet wide centered on the fence alignment. Transects would be no greater than 30 feet apart. The fence alignment would be flagged prior to the biological survey. Two complete passes of complete coverage would be conducted. All desert tortoise burrows, and burrows constructed by other species that might be used by desert tortoises, would be examined and excavated to their terminus to determine occupancy. Any burrow within the fence line would be collapsed after confirmation that it is not occupied by a desert tortoise, or if occupied, the desert tortoise has been removed. Removed tortoises would be relocated. The authorized biologists would be primarily responsible for this survey.

(a) Following installation of desert tortoise exclusionary fencing, the solar field construction area would be cleared of desert tortoises. Up to three complete passes with complete coverage would be conducted. The first pass transects would be conducted at 15-foot intervals. Subsequent transects would be no wider than 30 feet. Each separate survey would be walked in a different direction to allow opposing angles of observation. Two consecutive passes would be completed without finding any tortoises or new tortoise sign prior to declaring the site clear of tortoises. If no desert tortoises are observed during the second survey, a third survey would not be conducted. The authorized biologists would be primarily responsible for the clearance surveys. Some authorized biologists may be substituted with desert tortoise monitors and would be placed between authorized biologists during the surveys. After the area surveyed is determined to be absent of desert tortoises, the areas may be open to a vegetation salvage program, if the BLM stipulates vegetation salvage.

(b) All potential desert tortoise burrows located would be excavated by hand by an authorized biologist, desert tortoises removed, and collapsed or blocked to prevent occupation by desert tortoises. If excavated during May through July, the authorized biologist would search for desert tortoise nests/eggs, which are typically located near the entrance to burrows. All desert tortoise handling and removal, and burrow excavations, including nests, would be conducted by an authorized biologist in accordance with the USFWS-approved protocol (Desert Tortoise Council, 1999). If the Desert Tortoise Council releases a revised protocol for handling of desert tortoises before initiation of project activities, the revised protocol would be implemented for the project.

(c) Following the desert tortoise clearance and relocation/translocation out of a solar field construction area and vegetation salvage, heavy equipment would enter the solar field fenced sites to clear, grub, level, and trench. A desert tortoise monitor would be on site during initial clearing and grading to relocated tortoises missed during the clearance survey. Should a desert tortoise be discovered, an authorized biologist would remove the tortoise.

11. The transmission line and new access ROWs would be surveyed and, if necessary, cleared of desert tortoises. Tortoises would not be relocated from these areas unless an occupied burrow is observed. Tortoises excavated from burrows would be relocated to unoccupied natural or artificially constructed burrows immediately following excavation. The artificial or unoccupied natural burrows must occur 150 to 300 feet from the original burrow. Relocated tortoises would not be placed in existing occupied

burrows. If an existing burrow that is similar in size, shape, and orientation to the original burrow is unavailable, the authorized biologist would construct one. Desert tortoises moved during less active periods would be monitored for at least 2 days after placement in the new burrows to ensure their safety. The authorized biologist would be allowed some judgment and discretion to ensure that survival of the desert tortoise is likely. Desert tortoises that are found above ground and need to be moved from harm's way would be placed in the shade of a shrub, from 150 to 300 feet from the point of encounter. The authorized biologist would inform workers in the area that the tortoise is present and may re-enter the work area. Relocation/translocation would be authorized by the USFWS biological opinion and would be part of the overall project relocation/translocation activity.

12. The stormwater drainage control features construction areas would be temporarily fenced. The temporary exclusionary fencing would consist of galvanized hard wire cloth, silt fencing, or orange construction fencing. The fencing would be buried approximately 6 inches below ground or bent at a right angle toward the outside of the work area and covered with dirt, rocks or gravel to discourage desert tortoises from digging under the fence. The fence installation would be supervised and monitored under the direction of authorized biologists and desert tortoise monitors during construction. The stormwater drainage control features construction areas would be surveyed and, if necessary, cleared of desert tortoises. Tortoises found in a burrow would be relocated. Tortoises excavated from burrows would be relocated to unoccupied natural or artificially constructed burrows immediately following excavation. The artificial or unoccupied natural burrows would be located 150 to 300 feet from the boundary of the construction area. Relocated tortoises would not be placed in existing occupied burrows. If an existing burrow that is similar in size, shape, and orientation to the original burrow is unavailable, the authorized biologist will construct one. Desert tortoises moved during less active periods would be monitored for at least 2 days after placement in the new burrows to ensure their safety. The authorized biologist would be allowed some judgment and discretion to ensure that survival of the desert tortoise is likely.

13. Access by project-related personnel to the Project site would be restricted to established access roads. Cross-country vehicle and equipment use outside designated work areas would be prohibited.

14. NextLight would require personnel to exercise caution when traveling to and from the site. To minimize the likelihood of vehicle strikes of desert tortoises outside the fenced areas, a 25 mile per hour speed limit would be enforced on authorized access routes to the work site. Speed limit signs would be posted on both sides of these roads.

15. Trash receptacles at the work site would have self-locking lids to prevent entry by opportunistic predators such as common ravens and coyotes. Trash receptacles would be emptied at least weekly or when full.

16. Other than law enforcement or security personnel, project personnel would be prohibited from bringing pets and firearms to the project site.

17. Project employees working outside a cleared, fenced area would be required to check under a vehicle or equipment before it is moved. If a desert tortoise is encountered the vehicle would not be moved until the animal has voluntarily moved a safe distance from the parked vehicle. Desert tortoises may be moved by an authorized biologist or desert tortoise monitor for this purpose.

    All activities would be restricted to pre-approved locations. If unforeseen circumstances require expansion of activities, the potential expanded work areas would require approval by the BLM and possibly re-initiation of the Section 7 consultation. The expanded work areas would be surveyed by an authorized biologist for desert tortoises prior to requesting approval from the BLM. Use of protection measures would be implemented within the expanded work areas based on the judgment of the BLM and an authorized biologist.

18. At the end of each work day, NextLight would ensure that bores and other excavations outside the permanently fenced area that constitute wildlife pitfalls would either be immediately backfilled, sloped at a 3:1 ratio at the ends to provide tortoises and other wildlife escape ramps, covered, or fully enclosed with fencing to prevent any entrapment. All excavations outside a fenced area would be inspected periodically throughout and at the end of each workday by an authorized biologist, desert tortoise monitor, or the FCR. Should a tortoise become entrapped, an authorized biologist would remove and relocate the tortoise to a safe location.

19. Any construction pipe, culvert, or similar structure with a diameter greater than 3 inches, stored less than 8 inches above ground and within desert tortoise habitat (outside a fenced area) for one or more nights, would be inspected for tortoises before the material is moved, buried, or capped. As an alternative, all such structures may be capped before being stored outside the fenced area, or placed on pipe racks. These materials would not need to be inspected or capped if they are stored within a fenced area after the clearance surveys have been completed.

20. All vehicles and equipment would be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. All fuel or hazardous waste leaks, spills, or releases would be stopped or repaired immediately and cleaned up at the time of occurrence. NextLight would be responsible for spill material (including contaminated soil) removal and disposal to an approved offsite landfill or other licensed facility. Servicing of construction equipment would take place only at a designated area. Service/maintenance vehicles would carry a bucket and pads to absorb leaks or spills. Further, NextLight will prepare a Waste Management Plan and SPCC plan that addresses wastes and hazardous materials, respectively (refer to the POD in Attachment 1 (Section 1.3.10.2, Waste and Hazardous Materials Management).

21. All unused material and equipment, including soil and rock piles, would be removed upon completion of any construction activities located outside the permanently fenced area.

22. To compensate for desert tortoise impacts of the Project, NextLight would offset these effects by paying a per acre fee for lands that are being disturbed. This remuneration

would be used by the federal agencies to fund management actions expected to provide a direct benefit to the tortoise over time. Action may include: habitat acquisition, population or habitat enhancement or protection, research that increases knowledge of desert tortoise biology, habitat requirements or factors affecting habitat attributes, reducing loss of animals, or other actions.

23. An authorized biologist or FCR would notify the BLM and USFWS within 24 hours upon locating a dead or injured desert tortoise. The notification would be made by telephone and in writing. The report would include the date and time of the finding or incident (if known), location of the carcass, a photograph, cause of death (if known), and other pertinent information. Tortoises fatally injured or killed from Project-related activities would be submitted for necropsy, at the expense of NextLight, as outlined in *Salvaging Injured, Recently Dead, Ill, and Dying Wild, Free-Roaming Desert Tortoises (*Gopherus agassizii*)* (Berry, 2001). Tortoises with minor injuries would be transported to a nearby qualified veterinarian for treatment at the expense of NextLight. If an injured animal recovers, the BLM, USFWS, and NDOW would be contacted by NextLight for final disposition of the animal.

24. A Noxious Weed Control Plan would be prepared and submitted to the BLM for review and approval before construction begins. This plan will follow the Las Vegas Field Office's Resource Management Plan (BLM, 1998), *Noxious Weed Plan* (BLM, 2006), and the interagency guidance *Partners Against Weeds* (BLM, 2007) for an active integrated weed management program using weed control BMPs. (Note more detail is provided in the POD in Section 1.3.10.2, Noxious Weed Control).

25. NextLight would develop a Site Rehabilitation Plan for the revegetation and rehabilitation of areas disturbed by the Project. This plan will be implemented immediately after construction for the areas that are temporarily disturbed, such as portions of the transmission line route that involve disturbance.

4.2 Operation and Maintenance Minimization Measures

The following protection measures would be common to all O&M activities performed during life of the Project outside of the permanently fenced solar field areas:

1. NextLight would designate an FCR who would be responsible for overseeing compliance with the desert tortoise protection measures during operation or maintenance activities outside of the permanently fenced area of the solar field. The on-call FCR would be an authorized biologist approved by the BLM and USFWS. The FCR would follow the applicable measures described in Section 2.6.1 to reduce effects to desert tortoise or further habitat disturbance.

2. NextLight would notify the BLM and USFWS within 24 hours upon locating a dead or injured desert tortoise. Tortoises with minor injuries would be transported to a nearby qualified veterinarian for treatment at the expense of NextLight. If an injured animal recovers, the BLM and USFWS would be contacted by NextLight for final disposition of the animal.

3. Vehicle parking, material stockpiles, and construction-related materials used for maintenance or repair activities would be located within the permanently fenced area.

4. WEAP training would continue for all Project personnel during the operation phase. All employees and contractors involved with operation and maintenance would attend the agency-approved WEAP training. These employees would participate in the education program prior to initiation of work activities. New employees would receive formal, approved training prior to working on site. During the WEAP training, employees would be instructed to exercise caution when commuting to the project area. To minimize the likelihood for vehicle strikes of desert tortoises, the posted speed limit on the access roads would be 25 miles per hour. Speed limit signs would be posted on both sides of access roads to remind drivers of the speed limit when entering and exiting. This training would be conducted by NextLight personnel familiar with the approved WEAP.

5. Existing routes of travel to and from the Project site would be used outside the cleared and fenced areas. Cross-country use of vehicles and equipment outside the cleared and fenced areas would be strictly prohibited.

SECTION 5

Affected Environment

5.1 Regional Overview

The Project is located in the Ivanpah Valley, which is bounded by the Lucy Gray Range and McCullough Mountains to the east, the New York Mountains and the Mid-Hills to the south, the Ivanpah Mountains, Mescal Range, and Clark Mountain to the west, and the Clark Mountain and southernmost Spring Range to the north. The valley-facing slopes of these mountain ranges empty into Ivanpah and Roach dry lakes. From the rugged mountains to the dry lake basins, Ivanpah Valley encompasses a diverse assemblage of landscape features and vegetation communities.

The Ivanpah Valley has been affected by a variety of activities ranging from the construction and continued use of major highways such as I-15 and secondary roads, unimproved roads and trails, pipelines, the Union Pacific Railroad, casinos and retail businesses, recreational opportunities (such as the Primm Golf Club and land sailing/racing on the Ivanpah Dry Lakebed), electrical transmission lines and substations, and other facilities developed around the Nevada communities of Jean and Primm as well as the California community of Nipton, and the unzoned ranchette development along Nipton Road. The BLM also issues year-round cattle grazing allotments in the Ivanpah Valley (BLM, 2001).

The closest community to the Project is the town of Primm, Nevada. A retail and casino center along the I-15 corridor, with only a few residential facilities for casino employees, is located just west of the Project. The town of Jean, Nevada is located approximately 15 miles north of Primm along I-15. The southern outskirts of greater Las Vegas are about 30 linear miles north-northeast of the Project.

The proposed Project is located on an alluvial fan that extends westward from the Lucy Gray Mountains to the Ivanpah and Roach dry lakes. The alluvial fan is dissected by numerous ephemeral washes. Most are small (active channels 3 to 10 feet wide), but a few are larger, with bank-to-bank widths of 11 to 20 wide (CH2M HILL, 2009a).

5.2 Habitat and Vegetation

Mojave creosote bush (*Larrea tridentata*) scrub is the predominant vegetation type within the project area. Very small inclusions of Mojave wash scrub are also present. Mojave creosote bush scrub corresponds to the Holland type of the same name (Holland, 1986) and may correspond to one or more of the Creosote bush, Sonora-Mojave creosote bush-white bursage, or black bush series of *A Manual of California Vegetation* (Sawyer and Keeler-Wolf, 1995). Mojave creosote bush scrub comprises widely spaced evergreen and drought-deciduous shrubs, cacti, and yucca, from 1 to 9 feet in height. Creosote bush is the dominant species with burrobush (*Ambrosia dumosa*), cheesebush (*Hymenoclea salsola*), Nevada ephedra (*Ephedra nevadensis*), and Mojave yucca (*Yucca schidigera*) as common associates. Several species of cacti including California barrel cactus (*Ferocactus cylindraceus* var. *lecontei*),

clustered barrel cactus (*Echinocactus polycephalus* var. *polycephalus*), Engelmann's hedgehog cactus (*Echinocereus engelmannii*), buckhorn cholla (*Opuntia acanthocarpa* var. *coloradensis*), pencil cactus (*Opuntia ramosissima*), and beavertail cactus (*Opuntia basilaris* var. *basilaris*) are also common in parts of this community.

Numerous ephemeral washes occur throughout the Project area. During the reconnaissance surveys conducted by Sycamore Environmental Consultants, Inc. (2009), the beds of the ephemeral washes were reported as being mostly devoid of vegetation. Shrubs located along the banks of the ephemeral washes were generally larger than the shrubs located in upland areas. Species observed in and immediately adjacent to ephemeral washes in the Project area were similar to those observed in the surrounding Mojave creosote bush-scrub.

5.3 Wildlife Species

The diversity of vegetation and landscape features in and around the project area provides habitat for a rich variety of native Mojave Desert wildlife. These include the desert tortoise and other reptiles such as side-blotched lizards (*Uta stansburiana*) and long-nosed leopard lizards (*Gambelia wislizenii*) (Sundance Biology Inc., 2009).

The Project area provides forage, cover, roosting, and nesting habitat for a variety of bird species. Resident and migratory birds use the resources during the winter, migratory, and breeding seasons. This includes birds such as black-throated sparrow *(Amphispiza bilineata)*, sage sparrow (*Amphispiza belli*), mourning dove (*Zenaida macroura*), horned lark (*Eremophila alpestris*), and red-tailed hawk (*Buteo jamaicensis*) (Sundance Biology Inc., 2009). Additionally, the common raven (*Corvus corax*) is present year-round in the Ivanpah Valley due primarily to human developments (for example, electrical transmission lines and golf courses).

The Project area is likely to support a variety of mammal species such as desert woodrat (*Neotoma lepida*), black-tailed jackrabbit (*Lepus californicus*), whitetail antelope ground squirrel (*Ammospermophilus leucurus*), kit fox (*Vulpes macrotis*), and coyote (*Canis latrans*) (Sundance Biology Inc., 2009). The Clark Mountains and McCullough Range support mule deer (*Odocoileus hemionus hemionus*) and desert bighorn sheep (*Ovis canadensis nelsoni*).

SECTION 6

Status of Species and Habitat

6.1 Mojave Desert Tortoise (*Gopherus agassizii*)

This section describes the status, natural history, distribution, abundance and habitat of the Mojave desert tortoise relative to the Project area and includes the results of USFWS protocol surveys conducted in 2008 and 2009. The report documenting those surveys and the findings are provided in an appendix to this report.

6.1.1 Status

On April 2, 1990, USFWS determined the Mojave population of the desert tortoise to be a threatened species warranting protection under the ESA (USFWS, 1990). The tortoise was listed in response to loss and degradation of habitat caused by numerous human activities including urbanization, agricultural development, military training, recreational use, mining, and livestock grazing. The loss of individual desert tortoises to increased predation by common ravens, collection by humans for pets or consumption, collisions with vehicles on paved and unpaved roads, and mortality resulting from diseases also contributed to the listing.

The desert tortoise recovery plan details are the primary strategy for recovery and delisting of this species (USFWS, 1994b). As part of the recovery strategy, the USFWS designated critical habitat for the desert tortoise in portions of California, Nevada, Arizona, and Utah (USFWS, 1994b). Critical habitat was designated to identify areas containing key biological and physical attributes that are essential to the desert tortoise's survival and conservation, such as space, food, water, nutrition, cover, shelter, and reproductive sites. As part of the actions needed to accomplish the recovery of this species, land management goals include restriction of human activities that adversely affect desert tortoises within critical habitat (USFWS, 1994b).

The Project is not located within or adjacent to designated critical habitat for this species. The closest critical habitat is located in California approximately 1 mile south of the Project (CH2M HILL, 2009b).

6.1.2 Natural History, Distribution, Abundance, and Habitat

The desert tortoise is a long-lived reptile with a high domed shell, stocky, elephant-like limbs and a short tail. *Gopherus agassizii* is one of four tortoise species found in North America. The desert tortoise's range includes the Mojave Desert region of Nevada, southern California, the Arizona Strip, and the southwestern corner of Utah and the Sonoran Desert region of Arizona and northern Mexico. The desert tortoise is divided into two administratively designated populations, the Mojave and the Sonoran. The Mojave population is located north and west of the Colorado River and the Sonoran includes all tortoises south and east of the river in Arizona and Mexico (Averill-Murray and Swann,

2002). The Mojave population is primarily found in creosote bush-dominated basins with adequate annual forbs for forage.

Adult desert tortoises typically weigh 10 pounds or more and reach lengths of 11 to 16 inches (USFWS, 1994a). Desert tortoises have been known to live up to 70 years or more but the typical adult likely lives 25 to 35 years (USFWS, 1994a). Like many long-lived species, the tortoise has a relatively slow rate of reproduction. Sexual maturity is primarily size dependent (≥ 180 to 208 millimeters) with tortoises typically achieving breeding status at 15 to 20 years of age. Mating generally occurs in the spring (mid-March to late-May), with nesting and egg-laying occurring from April to July (Rostral et al., 1994; USFWS, 1994b). Desert tortoises have also been known to lay eggs in the fall (USFWS, 1994b). The female tortoise typically lays her eggs in an earthen chamber approximately 2.7 to 3.9 inches deep, excavated near the mouth of a burrow or under a bush (Woodbury and Hardy, 1948; USFWS, 1994b). Following egg-laying, the female covers the eggs with soil. Clutch size ranges from 2 to 14 eggs, with an average of 5 to 6 eggs (Luckenbach, 1982). Females can produce as much as three clutches in a season. Eggs are subject to predation from a variety of predators, and female tortoises have been observed apparently defending their clutches from Gila monsters (Gienger and Tracy, 2008). The eggs typically hatch 90 to 120 days later, between August and October. Hatchlings are born with a yolk sac that protrudes through the plastron. The yolk sac typically sustains the animal for up to 6 months. Eggs incubated above 89.3°F develop into females and males are the result of cooler incubation (USFWS, 1994b). Hatchling desert tortoises often go into hibernation in the late fall but often emerge for short active periods on warm sunny or rainy days (Luckenbach, 1982).

Desert tortoise activity is seasonally variable. Peak adult and juvenile desert tortoise-activity typically coincides with the greatest annual forage availability during the early spring and summer. However, tortoises will emerge from their burrows at any time of year when the weather is suitable. Hatchling desert tortoises typically become active earlier than adults and their greatest activity period can be expected between late winter and spring. During active periods, tortoises feed on a wide variety of herbaceous plants, including cactus, grasses, and annual flowers (USFWS, 1994b).

Annual home ranges have been estimated between 10 and 450 acres and are age, sex, seasonal, and resource density dependent (USFWS, 1994b). Although adult males can be aggressive toward each other during the breeding season, there can be a great deal of overlap in individual home ranges (USFWS, 1994b). More than 1.5 square miles of habitat may be required to meet the life history needs of a tortoise and individuals have been known to travel more than 7 miles at a time (BLM, 2001). In drought years, tortoises can be expected to wander farther in search of forage.

During their active period, desert tortoises retreat to shallow burrows and aboveground shade to escape the heat of the day. They will also retire to burrows at nighttime. Desert tortoises are primarily dormant in winter in underground burrows and sometimes congregate in communal dens.

Tortoise population densities have changed over time, resulting in their federal and state listing. Estimated densities of the total desert tortoise population in the 1980s ranged from 10 to 84 individuals per 0.5 hectare (Boarman, 2002). The same estimate for tortoises less than 140 millimeters in length ranged from 2 to 63 individuals for every 0.5 hectares, with

the realization that juvenile tortoises are more difficult to find and likely underrepresented in population estimates based solely on survey data. As presented in Boarman (2002), juvenile survivorship of 75 percent per year may be necessary to maintain population stability and survivorship of upwards to 97 percent may be required for the recovery of a declining population, making raven predation a major cause for concern.

It is well established that the desert tortoise is distributed throughout Ivanpah Valley with the exception of the dry lakes and developed areas. The non-lakebed portion of Ivanpah Valley area is excellent quality tortoise habitat with some of the highest population densities in the East Mojave while the North Ivanpah Valley area is quantified as good quality tortoise habitat (BLM, 2002).The project area is within the Northeastern Mohave Recovery Unit, one of six designated evolutionarily significant units within the range of the tortoise (USFWS, 1994b). When determining the size and location of Desert Wildlife Management Areas (DWMAs), the USFWS estimated that stable tortoise populations are likely to have densities of at least 10 adults per square mile (USFWS, 1994b). When the 1994 Recovery Plan was being issued some of the highest known tortoise densities were in southern Ivanpah Valley, with 200 to 250 adults per square mile (USFWS, 1994b). These 1990s densities were less than estimates for the southern Ivanpah Valley in the 1970s. That 20-year decline has been heavily attributed to raven predation (USFWS, 1994a). Densities for the northern Ivanpah Valley in the 1990s were typically less than 50 adults per square mile (USFWS, 1994b). According to the 1994 recovery plan, tortoise densities in the Ivanpah Valley DWMA were estimated between 5 and 250 adult tortoises per square mile and the area was given a threat level of 3 out of 5 (5 = extremely high) (USFWS, 1994b). The Desert Tortoise Recovery Planning Assessment Committee (DTRPAC) recommended revising the threat level for the Ivanpah Valley DWMA to a 4 to reflect 2003 conditions (DTRPAC, 2004).

As a result of 2002 line distance sampling surveys in the Ivanpah Valley plots within the Mojave National Preserve, live tortoises were found on 16 percent of the transects while carcasses were found on 46 percent, but there was not enough statistical data to suggest a recent decline in the adult population (DTRPAC, 2004).

6.1.3 Distribution and Abundance in the Project Area

6.1.3.1 Survey Methodology

As recommended in the USFWS Survey Protocol for any Non-Federal Action that may occur within the Range of the Desert Tortoise (USFWS, 1992), a desert tortoise presence or absence survey was conducted within the Project area. Modified TRED sampling configurations were employed. The Desert Tortoise Survey Report is provided in Attachment 3 and provides more detailed information. The purpose of the surveys was to estimate the desert tortoise population densities within the Project area. The survey area included Sections 1-3, 9-12, 14-16, 22, 23, and 26 or portions thereof that were surveyed October 20-31, 2008; and Sections 4, 5, 13, 24, and 25 or portions thereof that were surveyed August 26-28, 2009. All Sections are within Township 27S and Range 59E, Mount Diablo Base and Meridian.

6.1.3.2 Survey Results

In 2008, one live tortoise in a soil burrow was observed within the proposed Project boundary in the southeastern quarter of Section 11. In 2009, three live tortoises in two cover sites were observed within the proposed Project boundary in the northwestern quarter of

Section 25. Desert tortoise sign was observed in all Sections comprising the proposed Project site, with the exception of Section 12. Between the two surveys, all size/age classes were represented in the recent tortoise sign observed, one indicator of a healthy population. Reproduction appears to be occurring as well.

Calibration transects were not conducted for the Project. Based on old calibration values for over 1,000 transects conducted throughout the west and east Mojave desert between 1990 through the present, tortoise density estimates for the proposed Project area are approximately 20 or fewer tortoises per square mile in Section 1, 2, 9, 10, 11, 12, 13, 14, 23, 24, 25, and 26; and are approximately 20 to 50 tortoises per square mile in Sections 3, 4, 5, 15, 16, and 22. There were no estimates of greater than 50 tortoises per square mile.

Using these results, the estimated number of desert tortoises to be displaced within the fenced solar array area was calculated (Table 6-1). These calculations yield an estimate of 88 tortoises using the midrange of the density estimates. Using the low and high range of density estimates, tortoise numbers could range from 42 individuals on the low end to 123 individuals on the high end. It is reasonable to assume, on average, the mid-range estimates are sufficiently accurate for planning and permitting purposes.

The midrange calculations (see Table 6-1) used 10 tortoises per square mile for the zero to 20 category and 35 tortoise per square mile for the 20 to 50 category. For each section, the midrange estimate was multiplied the by the area of the solar array within a section of land. For example, in Section 2, 10 tortoises per square mile multiplied by 0.9 square mile yielded a midrange estimate of 9 tortoises for that section. In a similar manner, the low and high end estimates were made using the low and high estimate of tortoises per square mile for each section.

TABLE 6-1
Estimated Number of Tortoise to be Displaced within the Solar Field Fenced Area

Section Number	Area within the Fence (Square Mile)	Estimated range (mid-range) Tortoises/square mile	Low # tortoises	High # tortoises	Mid-Range # tortoises
3	.4	20-50 (35)	8	20	14
15	.4	20-50 (35)	8	20	14
2	.9	0-20 (10)	0	18	9
11	.9	0-20 (10)	0	18	9
14	.5	0-20 (10)	0	10	5
27	.1	--	0	0	0
26	.1	0-20 (10)	0	2	1
22	.9	20-50 (35)	18	45	32
23	.4	0-20 (10)	0	8	4
Totals	4.6		42	123	88

SECTION 7

Effects of the Proposed Action

7.1 Introduction

This section includes a summary of the analysis of the potential direct, indirect and cumulative effects to the desert tortoise resulting from the construction and operation of the proposed Project. Impacts to desert tortoise would be minimized by the construction and operation minimization measures described in Section 2.6 and were considered in this analysis

7.2 Direct Effects

Direct effects are those that are caused by the Proposed Action and occur at the same time and place.

The Proposed Action area is not located within designated critical habitat for the desert tortoise. It is located approximately 1 mile north of the nearest critical habitat unit. The Project area is within suitable habitat for the desert tortoise, and four live tortoises were observed during the combined 2008 and 2009 protocol-level surveys of the Project area. During the life of the Project, approximately 2,966.37 acres of desert tortoise habitat would be disturbed. Desert tortoises may be harmed during clearing and grubbing activities. Project activities could result in direct mortality, injury, or harassment of individuals as a result of encounters with vehicles or heavy equipment, whether in the Project area or from vehicles straying from designated access or designated areas into adjacent habitat. Other direct effects could include individual tortoises being crushed or entombed in their burrows, collection or vandalism, disruption of tortoise behavior during construction or operation of facilities, disturbance by noise or vibrations from the heavy equipment, injury or mortality from encounters with workers' or visitors' pets, and trash that may attract predators such as ravens and coyotes. Desert tortoises may also be attracted to the construction area by application of water to control dust, placing them at higher risk of injury or mortality. Minimization measures would be effective in reducing or eliminating direct mortality or injury to tortoise; however, relocating tortoises would be a form of harassment.

Increased human activity and vehicle travel would occur from the construction, which could disturb, injure, or kill individual tortoises. Also, tortoises may take shelter under parked vehicles and be killed, injured, or harassed when the vehicle is moved. Minimization measures would be effective in reducing or eliminating direct mortality or injury to tortoise; from vehicles.

Installation of the exclusionary fencing of the solar field could result in direct effects such as mortality, injury, or harassment of desert tortoises from equipment operation, installation activities, removal of tortoise burrows, and tortoise relocation/translocation. An estimated 88 tortoises would require relocation/translocation from the solar field.

The fencing would preclude desert tortoises from re-entering. This would result in fragmentation of habitat and individual home ranges. Capturing, handling, and relocating desert tortoises from the proposed site after the installation of the fencing would result in harassment and may also result in death or injury. Blythe et al. (2003) found that translocated Sonoran desert tortoises moved less than 0.5 mile returned to their home ranges within a few days. Tortoises moved outside their home ranges would likely attempt to return to the area from which they were moved; therefore, making it difficult to remove them from the potential adverse effects associated with project construction. Removal of habitat within a tortoise's home range or segregating individuals from their home range with a fence would likely result in displacement stress that could result in loss of health, exposure, increased risk of predation, increased intraspecific competition, and death. Tortoises may die or become injured by capture and relocation/translocation if these methods are performed improperly, particularly during extreme temperatures, or if they void their bladders. Averill-Murray (2001) determined that tortoises that voided their bladders during handling had significantly lower overall survival rates (0.81-0.88) than those that did not void (0.96). If multiple desert tortoises are handled by biologists without the use of appropriate protective measures and procedures, such as reused latex gloves, pathogens may be spread among the tortoises.

Hazardous materials and wastes pose potential threats to desert tortoises. However, NextLight's implementation of their Waste Management Plan, and SPCC plan would be effective in reducing, if not eliminating, these threats when properly implemented.

Fire poses a threat to desert tortoise habitat. Construction and operation and maintenance activities could result in fires. To prevent this from occurring, NextLight will install as fire protection water system as described in the POD (Section1.3.11, Fire Protection). This system would be effective in reducing, if not eliminating, the threat of fire when properly implemented.

7.3 Indirect Effects

Indirect effects are those that are caused by, or result from, the proposed action and are later in time, but reasonably certain to occur. In contrast to direct effects, indirect effects are more subtle, and may affect individuals and populations and habitat quality over an extended period of time, long after construction activities have been completed. Indirect effects are of particular concern for long-lived species such as the desert tortoise because project-related effects may not become evident in individuals or populations until years later.

Habitat quality would be reduced with the potential introduction of invasive plant species and compaction of soils. Additionally, the introduction of noxious weeds may lead to increased wildfire frequency (Brooks et al., 2003). Minimization measures would be effective in preventing invasive plant species from being import to the Project area. Other potential indirect effects include the permanently fenced area acting as barriers that would impede any long-term natural movements of desert tortoises attempting to return to their original home ranges and burrows.

The potential for severe long-term effects include collisions and collections along the paved access roads where vehicle frequency and speed is generally greatest. Census data indicate

that desert tortoise numbers decline as vehicle use increases (Bury et al., 1977) and that tortoise sign increases with increased distance from roads (Nicholson, 1978). Additional effects that may occur from casual use of the access roads in the vicinity of the action area include unauthorized trail creation and off-highway vehicle use. Minimization measures, as part of the Proposed Action, would be effective in reducing the effects of vehicular travel.

Human activities may provide food in the form of trash and litter or water that attracts tortoise predators such as the common raven, desert kit fox, feral dogs, and coyote (Berry, 1985; BLM, 1990). Facility infrastructure such as power poles could provide perching and nesting opportunities for ravens. Natural predation rates may be altered or increased when natural habitats are disturbed or modified. Common raven populations in some areas of the Mojave Desert have increased 1,500 percent from 1968 to 1988 in response to expanding human use of the desert (Boarman, 2002). Since ravens were scarce in the Mojave Desert prior to 1940, the current level of raven predation on juvenile desert tortoises is considered to be an unnatural occurrence (BLM, 1990). In addition to ravens, feral dogs have emerged as significant predators of the tortoise. Dogs may range several miles into the desert and have been found digging up and killing desert tortoises (USFWS, 1994a; Evans, 2001). Dogs brought to the project site with visitors may harass, injure, or kill desert tortoises, particularly if allowed off leash to roam freely in occupied desert tortoise habitat. Minimization measures would be effective in reducing or eliminating these effects. The addition of transmission line towers would provide new nesting and roosting locations for ravens. Ravens prey on hatchling and juvenile tortoises.

During construction, breaches in the solar field desert tortoise exclusionary fencing may occur; thus allowing tortoises to pass through the barrier and be affected by project-related activities. If breaches occur, materials and equipment left behind following construction and maintenance activities may entrap or entangle tortoises, attract desert tortoise predators such as common ravens and coyotes, or provide shelter for tortoises, which when removed may result in displacement or injury of the tortoise. During operation, surface water flows could also undercut and compromise the exclusion of the tortoise fences and, therefore, allow short-term access to desert tortoise and their predators until such time as repairs are made. Timely repair of the fencing would eliminate or greatly reduce these adverse effects.

Displaced (relocated or translocated) tortoises from the construction area would be moved into areas supporting other tortoises. As a result, there would be increased competition for forage; especially during drought years. This competition could have lasting effects on the vegetation communities as well as the desert tortoise population. Increased tortoise densities may lead to increased inter-specific encounters and thereby increase the potential for spread of disease. This would reduce overall health of the population. Increased tortoise densities would also lead to increased competition for shelter sites. Displaced tortoises would be exposed to increased predation as they learn new surroundings and find shelter.

7.4 Cumulative Effects

Cumulative effects are of those future state and private activities, excluding federal activities that are reasonably foreseeable. Because the BLM, U.S National Park Service, and Department of Defense administer much of the land surrounding the Project, many of the

actions that are reasonably expected to occur would be subject to the requirements of Section 7 consultation.

Development within the Ivanpah Valley has caused habitat loss, degradation, and fragmentation for the local desert tortoise population; as well as increased harm and harassment of individual tortoises. Urbanization, grazing, vandalism, illegal dumping, mining, off-road recreation, and construction of utility corridors, facilities and roads continue to contribute to the cumulative degradation of biological resources in the area. In general, actions on private lands within and adjacent to desert communities in Nevada including Las Vegas, Jean and Primm, and Barstow in California, are expected to continue to increase in proportion to increases in the human populations and access in these areas. Planned future actions, such as those that may occur as a result of the development of the Ivanpah Valley Airport, completion of rail lines, and others would likely continue this trend.

SECTION 8

References

Averill-Murray, R. C. and D. E. Swann. 2002. Impacts of Urbanization on Desert Tortoises at Saguaro National Park: Tortoise Density along the Southern Park Boundary. Technical Report 199, Nongame and Endangered Wildlife Program, Arizona Game and Fish Department. Phoenix, Arizona.

Averill-Murray, R. C. 2001. Program MARK survival analysis of tortoises voiding their bladders during handling. Proceeding of the 2001 Desert Tortoise Council Symposium. pp. 48.

Berry, K. H. 1985. Avian predation on the desert tortoise (*Gopherus agassizii*) in California.

Berry, K. H. 2001. Salvaging Injured, Recently Dead, Ill, and Dying Wild, Free-Roaming Desert Tortoises (*Gopherus agassizii*). Protocol prepared for Fish and Wildlife permit TE006556-11. June.

Blythe, A. K., D. E. Swann, R. J. Steidl, and E. W. Stitt. 2003. Movement patterns of translocated desert tortoises. Proceeding of the 2003 Desert Tortoise Council Symposium. p. 81.

Boarman, W. I. 2002. *Reducing predation by common ravens on desert tortoises in the Mojave and Colorado Deserts*. Unpublished report prepared for the Bureau of Land Management. July 18, 2002. 33 pp.

Brooks, M. L., T. C. Esque, and J. R. Matchett. 2003. Current status and management of alien plants and fire in desert tortoise habitat. Proceedings of the 2003 Desert Tortoise Council Symposium. Page 82.

Bury, R. B., R. A. Luckenbach, and S. D. Busak. 1977. Effects of off-road vehicles on vertebrates in the California desert. U. S. Department of the Interior, Wildlife Research Report 8, Washington, D.C.

CH2M HILL. 2009a. *Delineation of Waters of the United States for the Silver State Photovoltaic Power Project*. October.

CH2M HILL. 2009b. Wildlife and Migratory Bird Literature Review: Silver State North and South Photovoltaic Power Projects. August.

Desert Tortoise Council. 1994 (Revised 1999). *Guidelines for Handling Desert Tortoises during Construction Projects*. Edward L. LaRue, Jr., editor. Wrightwood, California.

Desert Tortoise Recovery Office (DTRO). 2005. Desert Tortoise Exclusion Fence. Available at: http://www.fws.gov/ventura/speciesinfo/protocols_guidelines/docs/dt/DT_Exclusion-Fence_2005.pdf

Desert Tortoise Recovery Plan Assessment Committee (DTRPAC). 2004. *Desert Tortoise Recovery Plan Assessment*. October.

Evans, R. 2001. Free-roaming dog issues at the United States Marine Corps Air Ground Combat Center, Twentynine Palms, California. Proceedings of the 2001 Desert Tortoise Council Symposium. p. 61.

Gienger, C., R. C. Tracy. 2008. Ecological Interactions Between Gila Monsters (*Heloderma suspectum*) and Desert Tortoises (*Gopherus agassizii*). *The Southwestern Naturalist*: 53(2): 265-268.

Holland, R. F. 1986. Preliminary descriptions of the terrestrial natural communities of California. California Department of Fish and Game. Unpublished report.

Luckenbach, R. A. 1982. Ecology and Management of the Desert Tortoise (*Gopherus agassizii*) in California. Pages 1-37 in R.B. Bury, ed., North American Tortoise and Conservation Ecology. U.S. Department of Interior, Fish and Wildlife Service, Wildlife Research Report 12.

NextLight Renewable Power, LLC. 2010. *Draft Plan of Development, Amendment Silver State Solar Silver State Solar NVN-085077 (as amended to include NVN-085801)*. Prepared for Bureau of Land Management Las Vegas Field Office. January.

Nicholson, L. 1978. The effects of roads on desert tortoise populations. Proceedings of the 1978 Desert Tortoise Council Symposium 1978:127-129.

Rostral, D. C., V. A. Lance, J. S. Grimbles, and A. C. Alberts. 1994. Seasonal reproductive cycle of the desert tortoise (*Gopherus agassizii*) in eastern Mojave Desert. *Herpetology Monographs*. Volume 8. 72-102 pp.

Sawyer, J. and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society, Sacramento.

Stebbins, R. C. 1985. *Peterson Field Guides: Western Reptiles and Amphibians*. Houghton Mifflin Company, Boston, Massachusetts.

Sundance Biology, Inc. 2009. *Presence/Absence Survey for the Desert Tortoise (*Gopherus agassizii*), on the proposed Silver State Solar Project in Ivanpah Valley, Clark County, Nevada*. September.

U.S. Bureau of Land Management (BLM). 1990. *Draft raven management plan for the California Desert Conservation Area*. Prepared by Bureau of Land Management, California Desert District, Riverside, California. April.

U.S. Bureau of Land Management (BLM). 1998. Las Vegas Resource Management Plan and Environmental Impact Statement. Volumes I and II. U.S. Department of the Interior, BLM, Las Vegas Field Office.

U.S. Bureau of Land Management (BLM). 2002. Proposed Northern and Eastern Mojave Desert Management Plan (NEMO), Amendment to the California Desert Conservation Area Plan, Draft California Desert Conservation Area Plan Amendments for the Northern and Eastern Mojave Planning Area Final Environmental Impact Statement. July 2002. Available at: http://www.blm.gov/ca/news/pdfs/nemo2002/.

U.S. Bureau of Land Management (BLM). 2006. Noxious Weed Plan. U.S. Bureau of Land Management, Las Vegas Field Office. December.

U.S. Bureau of Land Management (BLM). 2007. Partners Against Weeds. http://www.nv.blm.gov/Resources/noxious_weeds.htm

Bureau of Land Management (BLM). 2008. *Solar Energy Plan of Development*. July 3.

U.S. Fish and Wildlife Service (USFWS). 1990. Endangered and threatened wildlife and plants; determination of threatened status for the Mojave population of the desert tortoise. *Federal Register* 55(63):12178-1219.

U.S. Fish and Wildlife Service (USFWS). 1992. *Field Survey Protocol for Any Federal Action That May Occur within the Range of the Desert Tortoise*. January.

U.S. Fish and Wildlife Service (USFWS). 1994a. Federal Register, Department of the Interior, Fish and Wildlife Services. Rules and Regulations. Determination of Critical Habitat for the Mojave Population of the Desert Tortoise; Final Rule. 50 CFR Part 17. 59 FR 5820-5866. February 8.

U.S. Fish and Wildlife Service (USFWS). 1994b. *Desert Tortoise (Mojave population) Recovery Plan*. Portland, Oregon. 73 pages plus appendices.

Woodbury, A. M. and R. Hardy. 1948. Studies of the desert tortoise, *Gopherus agassizii*. *Ecology Monographs*. Volume 18, Number 2. 145-200 pp.