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November 15, 2010

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DCANNON@LIONELSAWYER.COM

HAND DELIVERY

Donna Skau, Commission Secretary
PUBLIC UTILITIES COMMISSION OF NEVADA
1150 E. William Street
Carson City, Nevada 89701

Re: **DOCKET NO. 10-03010**; APPLICATION OF AMARGOSA VALLEY SOLAR I, LLC FOR AUTHORITY UNDER THE PROVISIONS OF THE UTILITY ENVIRONMENTAL PROTECTION ACT FOR A PERMIT TO CONSTRUCT THE AMARGOSA SOLAR POWER PROJECT CONSISTING OF A 536 MW SOLAR THERMAL PLANT, RELATED ELECTRIC AND WATER TRANSMISSION FACILITIES, WASTEWATER SEPTIC SYSTEM, AND ASSOCIATED FACILITIES TO BE LOCATED APPROXIMATELY 80 MILES NORTHWEST OF LAS VEGAS IN NYE COUNTY, NEVADA.

Dear Donna:

Accompanying this letter, for filing with the Public Utilities Commission of Nevada (the "Commission") in Docket No. 10-03010, and pursuant to the Nevada Utility Environmental Protection Act, is the Second Amended Application of Amargosa Valley Solar I, LLC for authority and a permit to construct a solar-thermal power plant and related electric and water transmission facilities and wastewater disposal facilities. Also enclosed is a Draft Notice for the Application and Lionel Sawyer & Collins' Check No. 501657, in the amount of $50.00 for the filing fee. Should you have any questions, or require additional information, please advise.

Sincerely,

Dan R. Reaser, Esq.
Douglas A. Cannon, Esq.

DRR:dlw
Enclosures: Second Amended Application, Draft Notice & Check No. 501657
cc: Parties of Record

PUBLIC UTILITIES COMMISSION OF NEVADA
DRAFT NOTICE
(Applications, Tariff Filings, Complaints, and Petitions)

Pursuant to Nevada Administrative Code ("NAC") 703.162, the Commission requires that a draft notice be included with all applications, tariff filings, complaints and petitions. Please complete and include **ONE COPY** of this form with your filing. (Completion of this form may require the use of more than one page.)

A title that generally describes the relief requested (see NAC 703.160(5)(a)):

> Application of Amargosa Valley Solar I, LLC for authority under the provisions of the Utility Environmental Protection Act for a permit to construct the Amargosa Solar Power Project consisting of a 536 MW solar thermal plant, related electric and water transmission facilities, wastewater septic system, and associated facilities to be located approximately 80 miles northwest of Las Vegas in Nye County, Nevada.

The name of the applicant, complainant, petitioner or the name of the agent for the applicant, complainant or petitioner (see NAC 703.160(5)(b)):

> Amargosa Valley Solar I, LLC

A brief description of the purpose of the filing or proceeding, including, without limitation, a clear and concise introductory statement that summarizes the relief requested or the type of proceeding scheduled **AND** the effect of the relief or proceeding upon consumers (see NAC 703.160(5)(c)):

> See Public Notice of Second Amended Application at Exhibit G-2 of Second Amended Application.

A statement indicating whether a consumer session is required to be held pursuant to Nevada Revised Statute ("NRS") 704.069(1)[1]:

> Not applicable

If the draft notice pertains to a tariff filing, please include the tariff number **AND** the section number(s) or schedule number(s) being revised.

> Not applicable.

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[1] NRS 704.069 states in pertinent part:

> 1. The Commission shall conduct a consumer session to solicit comments from the public in any matter pending before the Commission pursuant to NRS 704.061 to 704.110 inclusive, in which:
> (a) A public utility has filed a general rate application, an application to recover the increased cost of purchased fuel, purchased power, or natural gas purchased for resale or an application to clear its deferred accounts; and
> (b) The changes proposed in the application will result in an increase in annual gross operating revenue, as certified by the applicant, in an amount that will exceed $50,000 or 10 percent of the applicant's annual gross operating revenue, whichever is less.

Utility Environmental Protection Act
Second Amended Application for Permit to Construct

Amargosa Solar Power Plant Project

Applicant: Amargosa Valley Solar I, LLC

Transmittal Letter
Draft Form of PUCN Notice
UEPA Application (Second Amended)

- Exhibit G-2– Public Notice of Second Amended Application
- Exhibit H-2– Proof of Publication of Notice of Second Amended Application
- Exhibit I-2– Proof of Service of Second Amended Application to Nevada State Clearinghouse
- Exhibit J-3 – Pre-Construction Schedule of Permits, Licenses & Approvals
- Exhibit J-4 – Additional List of Permits, Licenses & Approvals
- Exhibit L – Final Environmental Impact Statement

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UTILITY ENVIRONMENTAL PROTECTION ACT
SECOND AMENDED APPLICATION FOR PERMIT TO CONSTRUCT

AMARGOSA- SOLAR POWER PLANT PROJECT

APPLICANT: AMARGOSA VALLEY SOLAR I, LLC

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PUBLIC UTILITIES COMMISSION OF NEVADA

IN THE MATTER OF:

Application of Amargosa Valley Solar I, LLC for authority under the provisions of the Utility Environmental Protection Act for a permit to construct the Amargosa Solar Power Project consisting of a 536 MW solar thermal plant, related electric and water transmission facilities, wastewater septic system, and associated facilities to be located approximately 80 miles northwest of Las Vegas in Nye County, Nevada.	)	**Docket No. 10-03010**

UTILITY ENVIRONMENTAL PROTECTION ACT
SECOND AMENDED APPLICATION FOR PERMIT TO CONSTRUCT

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PUBLIC UTILITIES COMMISSION OF NEVADA

IN THE MATTER OF:

Application of Amargosa Valley Solar I, LLC for authority under the provisions of the Utility Environmental Protection Act for a permit to construct the Amargosa Solar Power Project consisting of a 536 MW solar thermal plant, related electric and water transmission facilities, wastewater septic system, and associated facilities to be located approximately 80 miles northwest of Las Vegas in Nye County, Nevada.	)	**Docket No. 10-03010**

UTILITY ENVIRONMENTAL PROTECTION ACT
SECOND AMENDED AND RESTATED APPLICATION FOR PERMIT TO CONSTRUCT

The Applicant, Amargosa Valley Solar I, LLC (the "Applicant" or "Company"), acting by and through its legal counsel, Lionel Sawyer & Collins, respectfully submits to the Public Utilities Commission of Nevada (the "Commission"), this second amended application for a permit to construct (the "Second Amended Application") the Amargosa Solar Power Project (the "Project"). This Second Amended Application is made and based on the provisions of the Nevada Utility Environmental Protection Act ("UEPA"), codified at Sections 704.820 to 704.900 of the Nevada Revised Statues (the "NRS") and Sections 703.415 to 703.427 of the Nevada Administrative Code (the "NAC"). In support of the Second Amended Application, the Company provides the following evidence and information. Where indicated, the Company has restated information from the Original Application in order to assist the Commission and the Regulatory Operations Staff in their review of the Project.

I. INTRODUCTION

The Company filed an application on March 3, 2010, requesting authority under the provisions of UEPA to construct a nominal 500 megawatt gross power plant (in two phases), related electric and water transmission facilities, wastewater septic system and associated facilities (the "Original Application"). The Commission docketed the matter as Docket No. 10-

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03010. On March 19, 2010, the Draft Environmental Impact Statement for the Amargosa Farm Road Solar Energy Project (NVN-084359) (the "DEIS") was released by the Bureau of Land Management ("BLM"). On April 15, 2010 the Company filed an amended application (the "Amended Application") containing the DEIS. On October 15, 2010, the BLM released the Final Environmental Impact Statement ("FEIS") for the Project. The purpose of this Second Amended Application is to provide the Commission and Regulatory Operations Staff ("Staff") with a copy of the FEIS and to restate, amend and supplement the information contained in the Original Application and the Amended Application in light of the information contained in the FEIS. The Company anticipates the release of a record of decision ("ROD") no sooner than 30-days after the release of the FEIS.

II. INFORMATION REGARDING THE APPLICANT

The Company is a Delaware limited liability company qualified to do business in the state of Nevada. The Applicant's corporate headquarters and principal place of business is located at 1111 Broadway, 5th FL, Oakland, California 94607. The Company is a wholly owned subsidiary of Solar Millennium, LLC, which is a subsidiary of Solar Trust of America, LLC, a joint venture between Solar Millennium AG and Ferrostaal AG. Solar Trust of America, LLC is an integrated industrial solar solutions company strategically positioned to support the critical need for renewable energy generation in the United States, with a focus on commercially viable and proven parabolic trough solar thermal energy technology.

All communications or correspondence regarding the Application should be addressed or directed to the Company as follows (please note the new address for the Company):

Billy Owens, Senior Director – Project Development
SOLAR MILLENNIUM, LLC
1111 Broadway, 5th Floor
Oakland, California 94607
Telephone: 510.463.6522
Electronic mail: owens@solarmillennium.com

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With additional copy to:

SOLAR MILLENNIUM, LLC
Attn: Legal Counsel
1111 Broadway, 5th Floor
Oakland, California 94607
Telephone: 510.524.4517

And

Dan R. Reaser, Esq.
LIONEL SAWYER & COLLINS
1100 Bank of America Plaza
50 West Liberty Street
Reno, Nevada 89501
Telephone: 775.788.8619
Telecopy: 775.788.8682
Electronic mail: dreaser@lionelsayer.com

III. RESPONSES TO REQUIRED DISCLOSURES

The information required by NAC 703.421 and, as applicable, NAC 703.423, as set forth in the Original Application and Amended Application is restated, amended and supplemented in the following sections and exhibits in the order specified by the cited administrative regulations of the Commission to the extent such information is currently available.

Description of Location

1. A description of the location of the proposed utility facility as required by subsection 1 of NRS 704.870 including:

   (a) A general description of the location of the proposed utility facility, including a regional map that identifies the location of the proposed utility facility (NAC 703.421(1)(a) and NAC 703.423(1)(a));

This section of the Original Application and Amended Application is restated, amended and supplemented by Section ES-1.1 (Pages ES-1 to ES-3), Figure ES-1 (Page ES-2) and Figure ES-2 (Page ES-4) of the Executive Summary and Section 1.3 (Pages 1-3 to 1-6) of the FEIS.

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(b) A legal description of the site of the proposed utility facility, with the exception of electric lines, gas transmission lines, and water and wastewater lines, for which only a detailed description of the site is required (NAC 703.423(1)(b)); and

(i) Site of the Proposed Utility Facility

This section of the Original Application and Amended Application is restated, amended and supplemented by Section 1.3 (Pages 1-3) of the FEIS.

(ii) Site of electric transmission lines

This section of the Original Application and Amended Application is restated, amended and supplemented by Figure 1-2 (Page 1-5) of the FEIS.

(iii) Site of water transmission and wastewater facilities

This section of the Original Application and Amended Application is restated, amended and supplemented by Figures 1-2 (Page 1-5), 2-1 (Page 2-7), 2-4 (Page 2-17), 2-5 (Page 2-24), and Appendix B Figure 1 of the FEIS.

(c) Appropriately scaled site plan drawings of the proposed utility facility, vicinity maps and routing maps (NAC 703.423(1)(c)).

This section of the Original Application and Amended Application is restated, amended and supplemented by Figures 1-2 (Page 1-5), 2-2 (Page 2-9) and 2-4 (Page 2-17) and Sections 1.3 (Page 1-3) and 2.3 (Page 2-6) of the FEIS.

General Description of Facility

2. A description of the proposed utility facility, including:

(a) The size and nature of the proposed utility facility (NAC 703.421(2)(a) and NAC 703.423(2)(a));

This section of the Original Application and Amended Application is restated, amended and supplemented by Section ES-1.4.1 of the Executive Summary and Sections 1.2 (Page 1-2) and 2.3 (Page 2-6) of the FEIS.

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(b) The natural resources that will be used during the construction and operation of the proposed utility facility (NAC 703.421(2)(b) and NAC 703.423(2)(b));

(i) Natural resources use during construction

This section of the Original Application and Amended Application is restated, amended and supplemented by Sections 2.3 (Page 2-6) and 2.4 (Page 2-39) and Chapter 4 of the FEIS.

(ii) Natural resources use during operations

This section of the Original Application and Amended Application is restated, amended and supplemented by Sections 2.3 (Page 2-6) and 2.4 (Page 2-39) and Chapter 4 of the FEIS.

(c) Layout diagrams of the proposed utility facility and its associated equipment (NAC 703.423(2)(c)); and

This section of the Original Application and Amended Application is restated, amended and supplemented by Figure ES-2 (Page ES-4) of the Executive Summary and Figures 1-2 (Page 1-5), 2-2 (Page 2-8), 2-4 (Page 2-17), and Section 2.3.1 (Page 2-12) of the FEIS.

(d) Scaled diagrams of the structures at the proposed utility facility (NAC 703.423(2)(d)).

This section of the Original Application and Amended Application is restated, amended and supplemented by Figures 2-2 (Page 2-9), 2-4 (Page 2-17) and 4-11B (Page 4-107) of the FEIS.

Environmental Studies

3. A copy and summary of any studies which have been made of the environmental impact of the proposed utility facility as required by subsection 1 of NRS 704.870 and a summary of any studies which the applicant anticipates will be made of the environmental impact of the proposed utility facility as required by subsection 2 of NRS 704.870 and (NAC 703.421(3) and NAC 703.423(3)).

This section of the Original Application and Amended Application is restated, amended and supplemented as follows. The FEIS was released by the BLM to the public on October 15, 2010. A ROD is expected no sooner than 30 days after the release of the FEIS. A copy of the FEIS can be found at **Exhibit L**. In addition, the FEIS can be viewed on the internet at:

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http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/proposed_solar_millenium.html.

Reasonable Alternate Locations

4. A description of any reasonable alternate locations for the proposed utility facility, a description of the comparative merits or detriments of each location submitted, and a statement of the reasons why the location is best suited for the proposed utility facility, as required by subsection 1 of NRS 704.870 and (NAC 703.421(1)(b)-(c) and NAC 703.423(4)).

This section of the Original Application and Amended Application is restated, amended and supplemented by Sections ES-1.4.4.1 (Page ES-12) and 2.2.1.1(Page 2-2) of the FEIS which reviews and discusses the alternative sites that were evaluated, the criteria applied in the evaluation and the reasons for rejecting the alternative sites.

Public Notice

5. A copy of the public notice of the application or amended application and proof of the publication of the public notice, as required by subsection 4 or NRS 704.870 and (NAC 703.421(4) and NAC 703.423(5)).

A copy of the public notice of the Second Amended Application is provided in **Exhibit G-2.** The proof of publication of the public notice of the Second Amended Application accompanies this application as **Exhibit H-2.**

State Clearinghouse

6. Proof that a copy of the application or amended application has been submitted to the Nevada State Clearinghouse within the Department of Administration to enable agency review and comment (NAC 703.421(5) and NAC 703.423(6)).

A copy of the Proof of Service of the Second Amended Application on the Nevada State Clearinghouse accompanies this application as **Exhibit I-2**.

Probable Effect on Environment

7. An explanation of the nature of the probable effect on the environment, including:

(a) A reference to any studies, if applicable (NAC 703.423(7)(a)); and

Bureau of Land Management, Draft Environmental Impact Statement for the Amargosa Farm Road Solar Energy Project (NVN-084359), (March 19, 2010).

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Bureau of Land Management, Final Environmental Impact Statement for the Amargosa Farm Road Solar Energy Project (NVN-084359), (October 15, 2010).

(b) An environmental statement that includes (NAC 703.423(7)(b)):

(1) The name, qualifications, professions and contact information of each person with primary responsibility for the preparation of the environmental statement (NAC 703.423(7)(b)(1));

This section of the Original Application and the Amended Application is restated, amended and supplemented as follows. A list of preparers and reviewers and their qualifications and professions can be found in Section 5.5 of the FEIS (Page 5-15). The following is the contact information for the preparers and reviewers identified in the FEIS:

BLM
Nevada State Office
P.O. Box 12000
1340 Financial Blvd.
Reno, Nevada 89520
Telephone: 775.861.6400

BLM
Las Vegas and Pahrump Field Office
4701 North Torrey Pines Drive
Las Vegas, Nevada 89103
Telephone: 702-515-5000

EPG, Inc.
2020 West Sunset Road, Suite 100
Henderson, Nevada 89014
Telephone: 702.263.6553

GeoTrans, Inc.
363 Centennial Parkway, Suite 210
Louisville, Colorado 80027
Telephone: 303.665.4390

LFR, Inc.
10580 North McCarran Boulevard
Reno, Nevada 89503
Telephone: 775.324.7311

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University of Nevada-Reno
Southern Extension
Attn: George ("Buddy") Borden
4505 South Maryland Parkway
Las Vegas, Nevada 89154
Telephone: 702.222.3130

University of Nevada-Reno
Department of Resource Economics
Attn: Mariah Evans
Reno, Nevada 89557
Telephone: 775.784.6333

(2) The name, qualifications, professions and contact information of each person who has provided comments or input in the preparation of the environmental statement (NAC 703.423(7)(b)(2));

This section of the Original Application and Amended Application is restated, amended and supplemented as follows. A public scoping process was held prior to the release of the DEIS as well as following the release of the DEIS. The scoping process is detailed in Section 5.1 of the FEIS (Page 5-1). In total 298 people attended scoping meetings, 188 comments (151 prior to DEIS and 37 following publication of DEIS) were received addressing 1,175 individual topics of interest. The topics of interest are summarized in Table 5-4 of the FEIS (Page 5-6). A copy of all comments submitted following the release of the DEIS and comments received at public scoping meetings can be found in Appendix G of the FEIS. The Company does not have the name, qualifications, professions and contact information for each of the individuals that submitted comments beyond the information contained in the comments in Appendix G to the FEIS.

In addition to the public comments, six government entities accepted BLM's invitation to participate as cooperating agencies. The involvement of these cooperating agencies is detailed in Section 5.3 of the FEIS (Page 5-12). The cooperating agencies include:

Department of Defense
Attn: DeEllen Brasher
Regional Environmental Coordination Office (N40)
937 North Harbor Drive, Box 81, Building 1
San Diego, California 92132

Department of Energy
Linda Cohn
P.O. Box 98518
Las Vegas, Nevada 89193

National Park Service
Dan McGolothlin
1201 Oak Ridge Drive
Fort Collins, Colorado 80525

U.S. Army Corp of Engineers
Chris Hansen
300 Booth Street, Suite 2103
Reno, Nevada 89509
Nevada Department of Wildlife
Brad Hardenbrook
4747 Vegas Drive
Las Vegas, Nevada 89108

Nye County
Douglas Baker
P.O. Box 887
Tonopah, Nevada 89049

Moreover, BLM sent formal consultation letters to the following tribes:

Timbisha Shoshone Tribe
P.O. Box 206
Death Valley, California 92328

Pahrump Paiute Tribe
P.O. Box 3411
Pahrump, Nevada 89041

Las Vegas Paiute Tribe
One Paiute Drive
Las Vegas, Nevada 89106

Chemehuevi Indian Tribe
P.O. Box 1976
Havasu Lake, California 92363

Colorado River Indian Tribes
P.O. Box 26600
Parker, Arizona 85344

The FEIS was also filed with the U.S. Environmental Protection Agency. A biological assessment is being prepared for submission to the U.S. Fish and Wildlife Service as required by Section 7 of the Endangered Species Act. A Biological Opinion was signed November 1, 2010.

(3) A bibliography of materials used in the preparation of the environmental statement (NAC 703.423(7)(b)(3)); and

A complete bibliography of materials used in the preparation of the FEIS can be found in Chapter 6 of the FEIS.

(4) A description of (NAC 703.423(7)(b)(4)):

(I) The environmental characteristics of the project area existing at the time the application or amended application is filed with the Commission;

This section of the Original Application and the Amended Application is restated, amended and supplemented as follows. As indicated in the Original Application, the Company is proposing to construct and operate a nominal 500 megawatt gross solar power generation facility on 4,350 acres of land predominantly managed by the BLM (the total area to be included in the right of way is approximately 6,320 acres). The Project is located in Nye County, approximately 80 miles northwest of Las Vegas, Nevada. The land on which the Project is located is predominantly described as barren, desert pavement with a widely scattered growth of forb and grass species. While vegetation in the Project area is generally very sparse, the most common plant species on the Project site are creosote bush and burrobush. No federally threatened, endangered, proposed or candidate plant species were located during a survey of the Project area. A very limited number of cacti were identified in the Project area. While these cacti are not considered rare, they are protected under Nevada's statute for the protection of Christmas trees, cacti and yucca (NRS 527.060-.120).

The Project area is relatively flat with a slope of approximately 1 foot in 200 feet (0.5 percent slope). The area is traversed by numerous defined, intermittent and braided washes, though no riparian habitat was identified in the Project area. No continuous sources of surface

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water were observed in the Project area. Water users in the vicinity of the Project area rely on groundwater.

In a survey of the Project area, no federally listed threatened or endangered animal species were observed. The Project area is considered low grade desert tortoise habitat. Four abandoned desert tortoise burrows were identified in the Project area. In addition, some abandoned borrowing owl burrows were identified. The Project area also contains habitat for a number of fowl, lizard and snake species.

A complete description of the current environmental characteristics of the Project area is contained in Chapter 3 of the FEIS. Chapter 3 reviews the existing conditions of air quality, geological and mineral resources, soils, water resources, noise, biological resources, visual resources and other resources.

(II) The environmental impacts that the construction and operation of the proposed utility facility will have on the project area before mitigation; and,

The information contained in this section of the Original Application and Amended Application is restated, amended and supplemented as follows.

Air Quality

Effects on air quality can be separated into two project phases. First, are air quality effects during construction. Construction is anticipated to take approximately 39 months. During this period emissions will be similar to those associated with any large industrial project. Construction related emissions could include fugitive dust, PM10, PM2.5 and tailpipe emissions from heavy construction equipment and worker vehicles. The Company will comply with Federal and State air quality standards. Particulate emissions during construction would be transient in nature and may cause some unavoidable, short-term impacts. Mitigation measures will be implemented during construction to reduce air quality effects.

Second, are air quality effects during Project operation. Sources of emissions will include the LPG fueled auxiliary boiler (used at start-up), LPG fueled heater for freeze protection, a diesel fueled emergency fire water pump, a diesel fueled emergency generator, the

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cooling towers and various vehicles used in connection with operations. The Project is considered a minor source of air quality pollutant emissions from facility operations. The Project will not cause or contribute to a violation of any applicable National Ambient Air quality Standards ("NAAQS") or Potential for Significant Deterioration ("PSD") increment. The Project will require a Class I or II Air Quality Operating Permit. A detailed discussion on the air quality effects of the Project is contained in Section 4.1 of the FEIS (Page 4-1).

Soils

The Project will result in up to 4,350 acres of desert lands being cleared. The soils in the Project area consist of desert pavement and are not considered suitable for supporting agriculture. Clearing and grubbing the soil of vegetation will increase the possibility of wind and water induced soil erosion. Once the generation facility is in operation no additional effect on soil resources is expected. A detailed discussion on the effects of the Project on the soil is contained in Section 4.3 of the FEIS (Page 4-15).

Vegetation Resources

The Project will result in the clearing and grubbing of about 4,350 acres of native vegetation, primarily creosote bush and burrobush. The Project area would be maintained clear of vegetation for the life of the Project. The Project area did not contain any federally listed threatened or endangered plant species, through it did contain a small population of State protected cacti. A detailed discussion on the effects of the Project on vegetative resources is contained in Section 4.6.1 of the FEIS (Page 4-40).

Wildlife Resources

The Project area contains limited potential habitat for a number of fowl, mammal and reptile species. For example, the Project area is considered low quality habitat for the desert tortoise and is suitable habitat for burrowing owls No active desert tortoise burrows or burrowing owl nesting sites were identified in the Project area. The 4,350 acres of the Project area to be cleared would no longer be suitable wildlife habitat for the duration of the Project. A detailed discussion on the effects of the Project on wildlife is contained in Section 4.6.2 of the FEIS (Page 4-43).

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Water Resources

The Company will be purchasing or leasing existing groundwater water rights and will convert those water rights from irrigation to industrial use. As such, the proposed Project will not increase groundwater pumping in the hydrographic basin in which the Project is located. It is believed that impacts from groundwater pumping on groundwater levels and sensitive wildlife species, if any, will be negligible (see groundwater model in Appendix B of the FEIS).

There are no surface water resources in the Project area. Fortymile Wash traverses the Project area and is subject to periodic flood flows. Fortymile Wash will be re-routed as a result of the Project. A detailed discussion on the water resource effects of the Project is contained in Section 4.4 of the FEIS (Page 4-17).

Visual Resources

In the short term, visual impacts would occur due to the introduction of construction equipment and increased dust from construction activities. Long term impacts to visual resources will occur due to the introduction of various Project components (e.g., solar troughs, transmission lines, power block) to what has historically been a rural and natural setting. A detailed discussion on the visual resource effects of the Project is contained in Section 4.12 of the FEIS (Page 4-80).

A summary of the overall environmental effects of the Project is contained in Table ES-1-4 in the Executive Summary of the FEIS. A detailed discussion of the environmental effects of the Project is contained in Chapter 4 of the FEIS.

(III) The environmental impacts that the construction and operation of the proposed utility facility will have on the project area after mitigation.

This section of the Original Application and the Amended Application is restated, amended and supplemented as follows. The Company has designed the Project in a manner that significantly mitigates the environmental effects of the Project. Based on proposed mitigation measures, the FEIS states that "[t]he Proponent has committed to implementing mitigation measures in its Project design to avoid or minimize potential impacts from construction and

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operation of the Proposed Action. Implementation of the Proponent-committed environmental protection measures, and adherence to stipulations associated with any required federal, state, or local permit or approval, would reduce unavoidable adverse impacts on the human and natural environment." (FEIS § 4.14). The proposed mitigation measures are detailed in Appendix A to the FEIS. Below is a summary of some of the proposed mitigation measures.

Air Quality

During construction the Company will comply with all federal and state air quality standards. The Company will implement a comprehensive dust management program. A discussion of air quality related mitigation can be found in Section 4.1.4 of the FEIS (Page 4-13). A general discussion on the air quality effects of the Project with mitigation can be found in Sections 4.1 (Page 4-1) and 4.17.5.1 (Page 4-146) of the FEIS.

Soils

The Company is implementing a storm water management program to help reduce the risk and magnitude of erosion on the Project site and will strictly follow best management practices during construction and operations. The Company will also be installing various soil treatments (e.g. gravel, pavement) to reduce erosion throughout the life of the Project. The Company will be channelizing and re-routing Fortymile wash to control storm water flows on the Project site and surrounding properties. A discussion of soil related mitigation can be found in Section 4.3.4 of the FEIS. A general discussion on the effect of the Project on soils, including mitigation, can be found in Sections 4.3 (Page 4-15) and 4.17.5.3 (Page 4-147) of the FEIS.

Vegetation Resources

State protected cacti species will be salvaged. The lifespan of the proposed Project is expected to span at least 30 years. At the end of the Project's useful lifespan, the facilities will either be repowered or decommissioned. The decommissioning process will involve steps to dismantle and remove equipment, stabilize soil and drainages, and regrade and reshape features as necessary. Consistent with BLM requirements, a detailed decommissioning plan would be developed in a manner that both protects public health and safety and is environmentally acceptable. A discussion of vegetation resource related mitigation can be found in Section

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4.6.1.4 of the FEIS. A general discussion on the vegetative effects of the Project, including mitigation, can be found in Sections 4.6.1 (Page 4-40) and 4.17.5.6 (Page 4-150) of the FEIS.

Wildlife Resources

A pre-construction clearance survey of the Project area will occur to identify and relocate effected wildlife. The Project area will be fenced to prevent wildlife from entering the site. These actions will help reduce wildlife mortality due to Project activities. Because the Company is using existing water rights that have historically been placed to beneficial use there should be no effect on groundwater levels in the hydrographic basin. Using the best available model and a conservative assumption that Project pumping would add to, rather than replace existing pumping, impacts to water levels in Devils Hole were determined to be negligible. Therefore, indirect impacts from groundwater pumping to Devils Hole and associated sensitive wildlife species at Ash Meadows are also presumed to be negligible. A discussion of wildlife resource related mitigation can be found in Section 4.6.2.4 of the FEIS. A general discussion on the effects of the Project on wildlife, including mitigation, can be found in Sections 4.6.2 (Page 4-43) and 4.17.5.7 (Page 4-151) of the FEIS.

Water Resources

The use of existing water rights that have historically been placed to beneficial use will avoid the adverse effects of a new appropriation on existing groundwater levels. A discussion of water resource related mitigation can be found in section 4.4.5 of the FEIS. A general discussion on the water resource effects of the Project, including mitigation, can be found in Sections 4.4 (Page 4-17) and 4.17.5.4 (Page 4-148) of the FEIS. The Company notes that it has entered a water mitigation agreement with the U.S. Fish and Wildlife Service, the National Park Service and the BLM. The water mitigation agreement is discussed on Page 1-16 of the FEIS. A groundwater model for the Project can be found in Appendix B of the FEIS.

Visual Resources

The Company will implement dust control measures to mitigate short term visual effects. Long term impacts would be based on the introduction of moderate/strong visual contrast associated with Project components (e.g., solar troughs, power block, transmission lines, and

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ancillary buildings) within a rural to natural setting that would be visible to moderate and high sensitivity viewers. The majority of long term impacts are anticipated to range from low to moderate based on the relatively low profile of the project and the occurrence of various existing landscape features (i.e., topography, ornamental vegetation, and structures associated with the town of Amargosa Valley) that would screen the project and reduce contrast from moderate and high sensitivity viewers. Through mitigation measures the Company expects to comply with BLM Visual Resource Management Class IV objectives. A discussion of visual resource related mitigation can be found in Section 4.12.5 of the FEIS. A general discussion on the visual resource effects of the Project, including mitigation, can be found in Sections 4.12 (Page 4-80) and 4.17.5.13 (Page 4-157) of the FEIS. Additional analysis of visual resources can be found in Appendix D of the FEIS.

The environmental effects of the Project and associated mitigation measures are discussed in detail in Table ES-1-4 of the FEIS Executive Summary, Chapter 4 and Appendix A (Proposed Avoidance, Minimization and Mitigation Measures) of the FEIS. Additional mitigation measures may be identified in the ROD.

Reliable Utility Service

8. An explanation of the extent to which the proposed utility facility is needed to ensure reliable utility service to customers in this State, including:

   (a) If the proposed utility facility was approved in a resource plan or an amendment to a resource plan, a reference to the previous approval by the Commission (NAC 703.423(8)(a)); or

The information in this section is restated from the Original Application. The utility facility has not been approved in connection with a resource plan of NV Energy or an amendment thereto. The electric power produced by the first unit of this utility facility is intended for sale and use in Nevada pursuant to a power purchase agreement ("PPA") under negotiation with NV Energy. The electric power produced by the second unit of this utility facility may be sold to and used in California through a PPA that will be negotiated with an electric utility which desires to acquire such energy.

(b) If the proposed utility facility was not approved in a resource plan or an amendment to a resource plan, a description of the extent to which the proposed utility facility will:

(1) Provide utility service to customers in this State (NAC 703.423(8)(b)(1));

The information in this section is restated from the Original Application. Under Nevada's Renewable Portfolio Standard ("RPS") policy, NV Energy must acquire 6,057 MW hours of renewable energy by 2013. The Project will generate 7.5-10 percent of this total for use by electric customers in Southern Nevada, supporting Nevada's economic vitality and energy independence.

The output of the Project will be optimal during hottest months of the year and thus assist in satisfying peak summer electricity demands in the Las Vegas metropolitan area. The addition of up to 232 MW net in solar generated electric power will assist the State of Nevada to meet its RPS requirements. To the extent electric power is generated by the Project, Nevada can reduce reliance on less environmentally responsible alternative sources for electric power.

(2) Enhance the reliability of utility service in this State (NAC 703.423(8)(b)(2)); and

The information in this section is restated from the Original Application. Solar-thermal power plants with thermal storage technology are capable of providing reliable power supplies while reducing the adverse environmental impacts resulting from generating electricity using technologies that require the burning of fossil fuel. To the extent Nevada can obtain reliable domestically produced solar generated power, the State's exposure to price fluctuations or inventory constraints for power produced from fossil fuels in the regional energy markets is reduced.

(3) Achieve interstate benefits by the proposed construction or modification of transmission facilities in this State, if applicable (NAC 703.423(8)(b)(3)).

The information in this section is restated from the Original Application. This criterion is not applicable to the subject utility facility.

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Need Versus Effect on Environment

9. An explanation of how the need for the proposed utility facility as described in subsection eight balances any adverse effects on the environment as described in subsection seven (NAC 703.423(9)).

This section of the Original Application and Amended Application is restated, amended and supplemented as follows. The need for the Project stems from the Legislature's 2001 energy policy mandate which came in the form of the adoption of energy portfolio standards. As these standards exist today 25 percent of energy sold by a provider by 2025 must come from a Portfolio Energy System. NV Energy alone is required to acquire 6,057 megawatt hours of renewable energy by 2013. The Project will generate between 7.5-10 percent of this total requirement. Renewable energy projects in Nevada not only allow the portfolio standard to be met consistent with the Legislature's purposes, but also position Nevada to enjoy greater energy independence and allows Nevada to reap the economic and job growth benefits that flow from the proposed Project.

As discussed in detail above, the Company has sited and designed the Project in a manner that will minimize the environmental and public health effects. The Project area is classified as containing desert pavement soils with sparse vegetation consisting primarily of creosote bush and burrobush. This type of land is not suitable for agricultural activities and provides low quality wildlife habitat, evidenced by the minimal amount of wildlife activity identified in the Project area. The Company will be utilizing existing certificated groundwater rights and mitigation water rights and will therefore not be increasing the amount of water pulled from the underlying aquifer. The Company is also taking steps to mitigate visual effects associated with the Project. Based on all these facts the BLM, through the FEIS, identifies the construction of a dry-cooled solar electric generation facility, as proposed by the Company, as its preferred alternative (FEIS § ES-1.4.5).

In this case, the Legislature has mandated that a percentage of energy provided in Nevada be from renewable sources. The Company is proposing to construct a facility that would allow NV Energy, the largest electric provider in the State, to obtain up to 10 percent of its required

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2013 portfolio standard. This can be achieved through the construction of an energy production facility that will produce virtually no greenhouse gases, has nominal effects on vegetation and wildlife, will rely entirely on existing water resources and is located on land that has limited utilization potential from a resource management perspective. In the case of the Project, the State will obtain significant energy benefits with nominal environmental and public health effects.

Minimum Adverse Impact on Environment

10. An explanation of how the proposed utility facility represents the minimum adverse effect on the environment, including:

(a) The state of available technology (NAC 703.423(10)(a));

This section of the Original Application and the Amended Application is restated, amended and supplemented by Section 2.2.1.2 (Page 2-5) of the FEIS.

(b) The nature of various alternatives (NAC 703.423(10)(b)); and

This section of the Original Application and Amended Application is restated, amended and supplemented by Section 2.2 (Page 2-1) of the FEIS.

(c) The economics of various alternatives (NAC 703.423(10)(c)).

This section of the Original Application and the Amended Application is restated, amended and supplemented by Sections 3.9 (Page 3-104) and 4.9 (Page 4-52) of the FEIS.

Facility Conforms to Local Laws

11. An explanation of how the location of the proposed utility facility conforms to applicable state and local laws and regulations, including a list of all permits, licenses and approvals required by federal, state and location statutes, regulations and ordinances. The explanation must include a list that indicates:

(a) All permits, licenses and approvals the applicant has obtained, including copies thereof (NAC 703.423(11)(a)); and,

This section of the Original Application and Amended Application is restated, amended and supplemented as follows. The Company is actively pursuing the permits required for the construction and operation of the Project. A copy of the Company's development agreement with Nye County, Nevada can be found in Appendix F of the FEIS. The Company also has two

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water right applications pending with the Nevada Division of Water Resources (Application Nos. 79783 and 79699).

(b) All permits, licenses and approvals the applicant is in the process of obtaining to commence construction of the proposed utility facility. The applicant must provide an estimated timeline for obtaining these permits, licenses and approvals (NAC 703.423(11)(b)).

This section of the Original Application and Amended Application is restated, amended and supplemented as follows. The Company has prepared a revised schedule of permits, licenses or approvals necessary to commence construction of the proposed utility facility. This revised schedule is contained in **Exhibit J-3**. In addition, **Exhibit J-4** contains a table of other permits, licenses or approvals the Company will require prior to commencing operation. If the Commission includes the issuance of other permits as a condition to the issuance of the UEPA permit, the Company requests that the conditions be limited to those permits identified in **Exhibit J-3** (permits required to commence construction).

Public Interest

12. An explanation of how the proposed utility facility will serve the public interest, including:

(a) The economic benefits that the proposed utility facility will bring to the applicant and this State (NAC 703.423(12)(a));

This section of the Original Application and the Amended Application is restated, amended and supplemented Sections 4.9 (Page 4-52) and 4.17.5.10 (Page 4-153) of the FEIS.

(b) The nature of the probable effect on the environment in this State if the proposed utility facility is constructed (NAC 703.423(12)(b));

This section of the Original Application and Amended Application is restated, amended and supplemented as follows. In light of the proposed mitigation measures (see Appendix A of the FEIS), the Project will not result in unavoidable environmental effects. The nature of the environmental effects of the Project are detailed in Table ES-1-4 of the Executive Summary of the FEIS and in Chapter 4 of the FEIS. After the FEIS is released the BLM will issue a ROD that will contain a finding as to whether the Project will have a significant effect on the environment.

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The Company intends to file the ROD with the Commission when it is issued. The ROD will provide further information relevant to the probable effect of the Project on the environment.

(c) The nature of the probable effect on the public health, safety and welfare of the residents in this State if the proposed utility facility is constructed (NAC 703.423(12)(c)); and

This section of the Original Application and Amended Application is restated, amended and supplemented as follows. The BLM, after completing the FEIS, has identified the construction of the Project as its preferred alternative (FEIS § ES-1.4.5). This alternative was selected over a wet-cooled option, as well as a no action alternative (under which no facility would be constructed). The Project will allow energy to be produced without the environmental effects commonly associated with fossil fuel energy production. The Project in the long-term provides a means of producing energy in a manner that causes negligible effects on public health, safety and welfare. The Company anticipates the BLM's issuance of a ROD that will contain a finding that the Project will have no significant effect on public health, safety or welfare. The Company does not anticipate any significant effects and remains committed to mitigating any significant public health, safety or welfare issues.

The Company intends to file the ROD with the Commission when it is issued. The ROD will provide further information relevant to the probable effect of the Project on public health, safety and welfare.

(d) The interstate benefits expected to be achieved by the proposed electric transmission facility in this State, if applicable (NAC 703.423(12)(d)).

The information in this section is restated from the Original Application. This criterion is not applicable to the subject utility facility.

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IV. CONCLUSION

The Applicant reserves that right to amend and supplement this Second Amended Application as permitted and contemplated pursuant to NRS 704.820 to 704.900 and NAC 703.415 to 703.427. Based on the Original Application, the Amended Application, the Second Amended Application and any other amendment or supplement thereto, the Applicant requests the Commission approve and issue a permit under the UEPA to construct the Project.

DATED and respectfully submitted this 15th day of November, 2010.

LIONEL SAWYER & COLLINS

By: _____

Dan R. Reaser , Esq.
Nevada State Bar No. 1170
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Attorneys for the Applicant

CERTIFICATE OF SERVICE

I hereby certify that I am an employee of Lionel Sawyer & Collins and on November 15, 2010, I caused to be served, a true and correct copy of the foregoing **SECOND AMENDED APPLICATION FOR PERMIT TO CONSTRUCT** via U.S. Mail or as indicated below to the following parties:

Tammy Cordova, Staff Counsel
Regulatory Operations Staff
PUBLIC UTILITIES COMMISSION OF NEVADA
101 Convention Center Drive, Suite 250
Las Vegas, Nevada 89109

Eric Witkoski, Chief Deputy Attorney General
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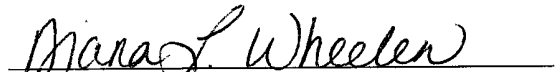
NYE COUNTY
Post Office Box 193
Tonopah, Nevada 89049

TOWN OF AMARGOSA VALLEY
HCR 69 Box 401W
Amargosa Valley, Nevada 89020

DATED this 15th day of November, 2010.



Diana L. Wheelen

EXHIBIT G-2

EXHIBIT G-2

BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA
NOTICE OF SECOND AMENDED APPLICATION FOR A PERMIT TO CONSTRUCT UTILITY FACILITY UNDER THE UTILITY ENVIRONMENTAL PROTECTION ACT

On March 3, 2010, Amargosa Valley Solar I, LLC (the "Company") submitted an application, pursuant to the Nevada Utility Environmental Protection Act ("UEPA"), to the Public Utilities Commission of Nevada (the "Commission") for authority and a permit to construct a solar-thermal power plant and related electric and water transmission facilities and wastewater septic system. The Commission has designated this matter as Docket No. 10-03010. On March 19, 2010, the Draft Environmental Impact Statement for the Amargosa Farm Road Solar Energy Project (NVN-084359) (the "DEIS") was released and on April 15, 2010, the Company filed its first amended application with the Commission. On October 15, 2010, the Final Environmental Impact Statement for the Amargosa Farm Road Solar Energy Project (NVN-084359) (the "FEIS") was made available. With the release of the FEIS the Company will be filing a second amended application with the Commission to submit the FEIS and to provide additional information about the proposed project.

The project will be located within Nye County approximately 80 miles northwest of Las Vegas, Nevada on approximately 4,350 acres of federally managed land and forty acres of privately owned land, situated North of Farm Road approximately four miles West of Nevada State Route No. 373 in Amargosa Valley, Nevada.

This project is being undertaken to generate up to 536 megawatt ("MW") gross of new electric power pursuant to a power purchase agreement with NV Energy for use in the Las Vegas metropolitan area and to provide reliable electric power consistent with federal and state renewable energy portfolio objectives.

The contents of the UEPA Application include, but are not limited to:

1. A general description of the location of the project;
2. An statement on the environmental effect of the project, including the relative attributes of electric power generated by a solar-thermal power plant as compared to a comparable fossil fuels power plant generating 536 MW gross, as well as the relative impacts on environmental and economic interests of developing and operating a dry-cooled solar-thermal power plant and a comparably sized and configured wet-cooled plant;
3. A description of the proposed utility facilities;
4. A description of how the utility facility and related transmission facilities will aid in providing customers with reliable service and will serve the public interest.

A copy of the application as first amended is available on the Commission's website. A copy of the second amended application will be available on the Commission's website following the Company's filing of that application on or about November 15, 2010. Additional information about the UEPA process and a person's right to participate in that process can be found in Nevada Revised Statutes and Nevada Administrative Code Chapters 703 and 704.

EXHIBIT H-2

EXHIBIT H-2

AFFP DISTRICT COURT
Clark County, Nevada

AFFIDAVIT OF PUBLICATION

STATE OF NEVADA)
COUNTY OF CLARK) SS:

Stacey M. Lewis, being 1st duly sworn, deposes and says: That she is the Legal Clerk for the Las Vegas Review-Journal and the Las Vegas Sun, daily newspapers regularly issued, published and circulated in the City of Las Vegas, County of Clark, State of Nevada, and that the advertisement, a true copy attached for,

LIONEL SAWYER & COLLINS 7888666LIO 6753635

was continuously published in said Las Vegas Review-Journal and / or Las Vegas Sun in 1 edition(s) of said newspaper issued from 10/30/2010 to 10/30/2010, on the following days:

10/30/2010

EMILY GONZALEZ
Notary Public State of Nevada
No. 09-8940-1
My appt. exp. Nov. 13, 2012

Signed: Stacey M. Lewis

SUBSCRIBED AND SWORN BEFORE ME THIS, THE 1st day of Nov., 2010.

Emily Gonzalez
Notary Public

BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA

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4. A description of how the utility facility and related transmission facilities will aid in providing customers with reliable service and will serve the public interest.

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PUB: October 30, 2010
LV Review-Journal

Affidavit of Publication

State of Nevada, County of Nye

I, Phyllis Trice, Legal Clerk for the Pahrump Valley Times, a bi-weekly newspaper published in Pahrump, Nye County, Nevada, being duly sworn, hereby certify that the following advertisement appeared in the Pahrump Valley Times: NOTICE OF SECOND AMENDED APPLICATION

A copy of the above-described advertisement is hereon attached. It was published in the Pahrump Valley Times on this date or dates:

NOVEMBER 3, 2010

Signed before a notary public:

Signature Phyllis Trice

Date November 3, 2010

Subscribed and sworn to before this notary on this date:

Date November 3, 2010

Holly Hernandez

Notary Public Signature

HOLLY HERNANDEZ
NOTARY PUBLIC
STATE OF NEVADA
NYE COUNTY
APPT. No. 07-4195-14
MY APPT. EXPIRES JULY 9, 2011

BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA
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PUBLISH: Nov. 3, 2010.

EXHIBIT I-2

EXHIBIT I-2

CERTIFICATE OF SERVICE

I hereby certify that I am an employee of Lionel Sawyer & Collins and on November 15, 2010, I caused to be served, a true and correct copy of the foregoing **SECOND AMENDED APPLICATION FOR PERMIT TO CONSTRUCT** via U.S. Mail or as indicated below to the following parties:

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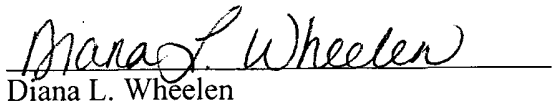
901 S. Stewart Street, Suite 4001
Carson City, Nevada 89701

NEVADA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
901 S. Stewart Street, Suite 5001
Carson City, Nevada 89701

NYE COUNTY
Post Office Box 193
Tonopah, Nevada 89049

TOWN OF AMARGOSA VALLEY
HCR 69 Box 401W
Amargosa Valley, Nevada 89020

DATED this 15th day of November, 2010.



Diana L. Wheelen

EXHIBIT J-3

EXHIBIT J-3

CONSTRUCTION PERMITTING GUIDE
Amargosa Valley Solar I, LLC - Amargosa Solar Power Plant Project
Nye County, Nevada

TYPE	PERMIT NAME	APPLICABILITY	WHERE TO SUBMIT	SUBMITTAL NECESSITIES	CONTACT	EST. REVIEW TIME
S	Surface Area Disturbance/Dust Control	This permitting generally deals with emitting facilities and surface area disturbance (SAD). A SAD is required if the project disturbs 5 or more acres of land. Relevant Code: NAC 445B.	NDEP-Bureau of Air Pollution Control.	http://ndep.nv.gov/bapc/permitd.html	Matthew DeBurle 775-687-9391 mdeburle@ndep.nv.gov	2 weeks. Recommend submit 2 months prior to construction. Obtain prior to construction of any air pollution emitting source or land disturbance
S	NPDES-Construction Stormwater Discharge	This permit is part of the federal National Pollution Discharge Elimination System (NPDES) program. This permitting generally deals with erosion control and discharge of sediment and other regulated substances during construction activities. A construction stormwater discharge permit and stormwater pollution prevention plan (SWPPP) is required for land disturbances of 1 acre or more. Relevant Code: NAC 445A	NDEP-Bureau of Water Pollution Control.	http://ndep.nv.gov/bwpc/storm_cont03.htm	Cliff Lawson 775-687-9435 clawson@ndep.nv.gov	Obtain prior to any land disturbance associated with construction activities.
S	NPDES-Industrial Activities	This permit is part of the federal National Pollution Discharge Elimination System (NPDES) program. This permit is generally required for facilities that discharge (wastewater, cooling water, etc.) to surface conveyance. Per conversation with Chad Schoop at NDEP, this permit may be required for the project if steam discharge can not be contained on-site	NDEP-Bureau of Water Pollution Control.	http://ndep.nv.gov/bwpc/storm_ind03.htm	Cliff Lawson 775-687-9435 clawson@ndep.nv.gov	30 days. Obtain prior to construction. NOI must be submitted at least 48 hours before a discharge of stormwater associated with industrial activity occurs
S	NPDES-Groundwater Discharge	This permit is part of the federal National Pollution Discharge Elimination System (NPDES) program. This permit deals with the discharge of water to the ground in area of Jurisdictional Waters	NDEP-Bureau of Water Pollution Control.	http://ndep.nv.gov/bwpc/nevapp03.pdf	Janine Hartley 775-687-6458 jhartley@ndep.nv.gov	6 to 8 months. Obtain prior to construction.
S	Commercial Septic System	This permitting generally applies to the construction and operation of on-site sewage disposal systems including septic systems.	NDEP-Bureau of Water Pollution Control if greater than 3,000 gallon capacity. Nye County Building & Safety Department if less than 3,000 gallon capacity.	http://ndep.nv.gov/bwpc/uic_lcssinfo.htm	Alex Lanza 775-687-9468 alanza@ndep.nv.gov	30 Days. Obtain prior to construction.
S	401 Water Quality Certificate	A 401 Water Quality Certificate is required for projects that would result in a discharge of a pollutant or impact to waters of the United States. Required if Section 404 permit is needed. State certification that federal permit does not violate water quality standards.	NDEP-Bureau of Water Quality Planning	http://ndep.nv.gov/bwqp/401cert.htm	Glen Gentry 775-687-9448 ggentry@ndep.nv.gov	Permit is concurrent with 404 Permit application. Can't not be determined until Jurisdictional Determination is complete. Obtain prior to construction.
F	Application for Transportation and Utility Systems and Facilities on Federal Lands (SF 299) ROW Authorization Permit	This ROW Authorization permit serves all commercial solar energy facilities per BLM Instruction Memorandum No. 2007-097, April 4, 2007 (BLM Solar Energy Development Policy). This application starts the process to gain right of way on BLM land. The SF 299 was filed on November 20, 2007.	BLM	http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS_REALTY_AND_RESOURCE_PROTECTION_/cost_recovery.Par.70932.File.dat/FormSF-299.pdf		ROW issued upon issuance of EIS Record of Decision. Obtain prior to construction.
F	Plan of Development	This ROW Authorization is a plan for construction and operation of solar facility. Part of application process for obtaining the federal ROW grant.	BLM			Obtain prior to construction.

F = Federal, S = State, L = Local (Nye County)

CONSTRUCTION PERMITTING GUIDE
Amargosa Valley Solar I, LLC - Amargosa Solar Power Plant Project
Nye County, Nevada

TYPE	PERMIT NAME	APPLICABILITY	WHERE TO SUBMIT	SUBMITTAL NECESSITIES	CONTACT	EST. REVIEW TIME
F	Form 2920	Temporary Use Permit for geotechnical investigations.	BLM			Obtain prior to onsite geotechnical investigation.
F	Environmental Impact Statement (EIS) and Record of Decision	An evaluation of the project's effects on natural and human resources to determine the potential for significant impacts. Activities which result in the environmental effects that meet the definition of significance.	BLM – National Environmental Policy Act (NEPA)			Obtain prior to construction.
F	National Historic Preservation Act (NHPA)	The Nevada State Historic Preservation Officer, Department of Parks and Recreation and appropriate Tribal Historic Preservation Officers must be consulted when projects are subject to review under Section 106 of the NHPA. This act requires that all federal agencies take into account the affect of their actions on historic properties (properties on or eligible for the National Register of Historic Places). Requirements of Section 106 review apply to any federal undertaking, funding, license, or permit. The Advisory Council on Historic Preservation (ACHP) must be provided an opportunity to comment.	BLM to contact Nevada State Historic Preservation Office and Tribal Historic Preservation Office (as appropriate)			With EIS
	Cultural Resource Use Permit	Archeological contractor to obtain Cultural Resource Use Permit from BLM prior to beginning work. Many Contractors may already have permits .	BLM, State Office	Permit to be obtained by archeological contractor; application includes outline of proposed work; name of institution and project principal investigator; dates of field work; type of investigations; description of site(s) with specific location information; and copy of agreement with institution where collections would be preserved..		With EIS

F = Federal, S = State, L = Local (Nye County)

CONSTRUCTION PERMITTING GUIDE
Amargosa Valley Solar I, LLC - Amargosa Solar Power Plant Project
Nye County, Nevada

TYPE	PERMIT NAME	APPLICABILITY	WHERE TO SUBMIT	SUBMITTAL NECESSITIES	CONTACT	EST. REVIEW TIME
F	Field Use Authorization	Holder of Cultural Resource Use Permit obtains a Field Use Authorization for the project from BLM field office.	BLM - Local Field Office	Field Authorization Form requests specific information on the location, schedule and nature of the archeological fieldwork and allows BLM to communicate specific constraints on a project type, schedule or location.	Local BLM Field Office Acheologist	With EIS. Submit reports during/after project.
F	Archaeological Resources Protection Act (ARPA) Permit	Archaeological Resources Protection Act (ARPA) of 1979, as amended, Section 4 Holder of Cultural Resource Use Permit, provides a research design and plan of work for the research project to obtain an ARPA permit.	BLM			With EIS
F	Department of Defense R 2508 Complex Sustainability Office review and approval	Review the project and its potential impact on military overflights and operations.	DOD - U.S. Department of Defense	A letter from the DOD, stating that construction and operation of the array would not adversely affect DOD operations will be sufficient to meet this requirement; such a letter would be included in the EIS	Deborah MacNeill - Director of Public Partnerships 702-652-7777	
F	Section 404 permit: Preconstruction Notification or Individual Permit	This permit is required if it is determined by jurisdictional determination that the project impacts a Water of the U.S.	USACE - U.S. Army Corps of Engineers			Individual Permit - 6 months to 1 year. Nationwide Permit - 45 days. General Permit - 30 days
F	No Hazard Declaration	Federal Regulation Title 14 Part 77. Establishes standards and notification requirements for projects affecting navigable airspace	Federal Aviation Administration			Prior to construction
F	Biological Opinion/Incidental Take Permit	Endangered Species Act (ESA) Section 7 Consultation, Biological Assessment	USFWS - U.S. Fish and Wildlife Service in consultation with Nevada Department of Wildlife			With EIS
	Water Rights - Temporary Construction Water	Required for temporary construction water	Nevada Department of Conservation and Natural Resources Division of Water Resources			2-6 weeks
S	Business Tax License	Required if intending to operate a business in Nevada.	Nevada Department of Taxation			Upon starting business in Nevada.

F = Federal, S = State, L = Local (Nye County)

CONSTRUCTION PERMITTING GUIDE
Amargosa Valley Solar I, LLC - Amargosa Solar Power Plant Project
Nye County, Nevada

TYPE	PERMIT NAME	APPLICABILITY	WHERE TO SUBMIT	SUBMITTAL NECESSITIES	CONTACT	EST. REVIEW TIME
S	Disturbance of any Native Plant Species and/or Native Plant Habitat Regarded as Threatened with Extinction	Conditional Permit for Disturbance or Destruction of Critically Endangered Plants. Relevant Code: NAC 527.260 through 527.300	Nevada Division of Forestry			Prior to Construction
S	Disturbance of Wildlife and/or Wildlife Habitat (Not specific to endangered species)	Written Approval Prior to Handling Any Wildlife as Defined by the State of Nevada. Relevant Code: NRS 445, 501.181, and NRS 503.597; NAC 504.520.	Nevada Department of Wildlife			Prior to Construction
L	Building permits	Building permits for structures.	Nye County Building Division		Richard Johnson, Manager of Building Safety - 775-751-4035	
L	Business License	Required for conducting business in Nye County. Administrative requirement	Nye County Licensing			1 month
L	Drainage Plan Approval	Required if project proposes to alter or construct within a drainage way.	Nye County Department of Public Works	http://www.nyecounty.net/DocumentView.aspx?DID=8064	David Fanning, Interim Director - 775-209-4134	4 weeks for initial submittal and 4 weeks for response to comments.
L	Amargosa Farm Road/Access Road Improvement Plan Approval	Required for improvements to public roadways.	Nye County Department of Public Works		David Fanning, Interim Director - 775-209-4134	

F = Federal, S = State, L = Local (Nye County)

EXHIBIT J-4

EXHIBIT J-4

OPERATION PERMITTING GUIDE
Amargosa Valley Solar I, LLC - Amargosa Solar Power Plant Project
Nye County, Nevada

TYPE	PERMIT NAME	APPLICABILITY	WHERE TO SUBMIT	SUBMITTAL NECESSITIES	CONTACT	EST. REVIEW TIME
S	Stationary Class II Source Operating Permit	This permitting generally deals with air emitting facilities. Relevant Code: NAC 445B	NDEP-Bureau of Air Pollution Control	http://ndep.nv.gov/bapc/permitd.html	Matthew DeBurle 775-687-9391 mdeburle@ndep.nv.gov	70 days. Submit prior to start of operations.
S	Safe Drinking Water (Privately Owned Public Water System)	This permit is required for public water systems providing water for consumptive use. A public water system is generally defined as a system, regardless of ownership, that provides 15 or more service connections or regularly serves 25 or more residents. Relevant Code: NRS 445, NAC 445A.450 through 445A.6731.	NDEP-Bureau of Safe Drinking Water.	http://ndep.nv.gov/bsdw/nws.htm	Jim Balderson 775-687-9517 jbalderson@ndep.nv.gov	30 days plus response to comment period. 60 days if treatment required plus response to comment period. Obtain prior to operations.
S	Boiler & Pressure Vessel Certificate	Required if intending in operating a bolier and/or pressure vessel.	NV Industrial Relations Division			1 week for review and approval
S	Water Rights	Required if water rights will need to be obtained from a private owner.	Nevada Department of Conservation and Natural Resources Division of Water Resources			Dependant on availability. If water availabile, 4-6 months request for permssion to use.
L	Fire Safety Compliance Certification	Building and operation fire safety	Nye County Building Division		Richard Johnson, Manager of Building Safety - 775-751-4035	2-3 weeks review and approval

F = Federal, S = State, L = Local (Nye County)

EXHIBIT L

EXHIBIT L

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Southern Nevada District
Pahrump Field Office
4701 N. Torrey Pines Drive
Las Vegas, NV 89130
http://www.blm.gov/nv/st/en/fo/lvfo.1.html

In Reply Refer To:
N-084359 2800 (NVS3100)

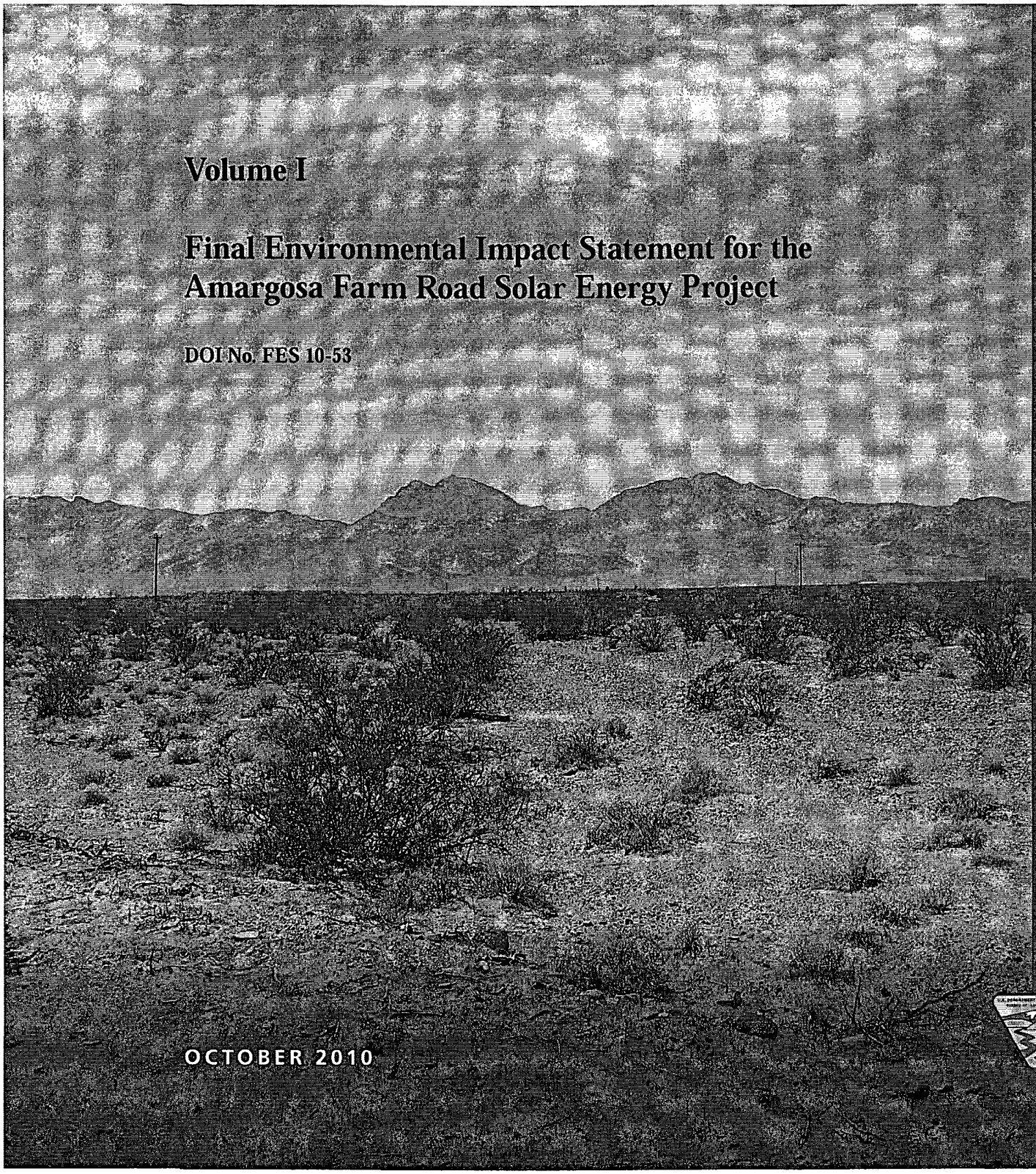
October 2010

Dear Reader:
Enclosed for your review is the *Amargosa Farm Road Solar Energy Project Final Environmental Impact Statement* (EIS). The Bureau of Land Management (BLM) Pahrump Field Office has prepared this Final EIS in response to a right-of-way application submitted by Solar Millennium, LLC to construct and operate two concentrated solar thermal parabolic trough power plant facilities on public lands in Amargosa Valley, approximately 80 miles northwest of Las Vegas, in Nye County, Nevada. Cooperating agencies for this Final EIS include the Department of Defense, Department of Energy, National Park Service, U.S. Army Corps of Engineers, Nevada Department of Wildlife, and Nye County. The purpose of this Final EIS is to assist BLM in its decision-making process with respect to the requested right-of-way.

This Final EIS considers the expected environmental effects associated with granting the right-of-way on public land and subsequent construction and operation of the Amargosa Farm Road Solar Energy Project. There was a 45 day comment period following the publication of the Draft EIS, during which comments were received via email, fax, and postal mail. There were also 4 public meetings held for comments to be received and entered into the public record. Overall 37 comment documents were received, and all of the comments have been addressed and can be found in Appendix G.

The Amargosa Farm Road Solar Energy Project Final EIS will be available for 30 days. A description of new or missed information within the Final EIS may be submitted within thirty days to:

BLM, Pahrump Field Office
Attn: Greg Helseth
Renewable Energy Project Manager
4701 N. Torrey Pines Dr.
Las Vegas, NV 89130
Fax: 702.515.5023
Email: solar_millennium@blm.gov



Volume I

Final Environmental Impact Statement for the Amargosa Farm Road Solar Energy Project

DOI No. FES 10-53

OCTOBER 2010

BLM

Pahrump Field Office

FINAL ENVIRONMENTAL IMPACT STATEMENT

FOR THE
AMARGOSA FARM ROAD
SOLAR ENERGY PROJECT
(NVN-084359)

Prepared for and under the Direction of:
Bureau of Land Management
Pahrump Field Office

Prepared by:
EPG, Inc.

On Behalf of:
Solar Millennium, LLC

October, 2010

BLM/NV/PA/ES-10/16+1793

BLM Mission Statement

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

BLM/NV/PA/ES-10/16+1793

DOI No. FES 10-53

Environmental Impact Statement for the Amargosa Farm Road Solar Energy Project

( ) Draft (X) Final

Lead Agency:	United States Department of the Interior Bureau of Land Management
Cooperating Agencies:	Department of Defense Department of Energy National Park Service United States Army Corps of Engineers Nevada Department of Wildlife Nye County
Counties Directly Affected:	Nye County, Nevada

Environmental Impact Statement Contact:

Greg Helseth
Renewable Energy Project Manager
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

Date Final EIS filed with U.S. Environmental Protection Agency: October 8, 2010

Abstract

The Bureau of Land Management (BLM) Pahrump Field Office has prepared this Final Environmental Impact Statement (EIS) in response to a right-of-way application submitted by Solar Millennium, LLC to construct and operate the Amargosa Farm Road Solar Energy Project (Project). The proposed Project would be located on BLM- administered lands, approximately 80 miles northwest of Las Vegas, in the Amargosa Valley in Nye County, Nevada. Some portions of the proposed Project would be located on private lands, including a 40-acre parcel at the south end of the Project area and possibly the water pipeline(s) that would supply water to the Project site.

The Project area is located approximately five miles south of U.S. Highway 95 and five miles west of NV 373. The majority of the proposed Project area would be located north of Amargosa Farm Road and east of Valley View Boulevard. Solar Millennium's original right-of-way request of 7,670 acres was refined to include only 6,320 acres based on biological and cultural resources surveys conducted during the spring 2009. Because the results were consistent throughout the proposed Project right-of-way, the acreage was reduced to the preliminary design configuration.

Project facilities would be located on approximately 4,350 acres and would include the solar fields, power blocks (one power block located in the center of each solar field), an office and maintenance building, parking area, lay-down area, stormwater detention basin, and switchyard.

This Final EIS considers the expected environmental effects associated with granting a right-of way on public land and subsequent construction and operation of the proposed Project. The BLM will use the EIS when rendering a decision about the requested right-of-way. The BLM's decision will be to grant, grant with modifications, or deny the request for a right-of-way on public lands administered by the BLM. This Final EIS satisfies the requirements of the National Environmental Policy Act, which mandates that federal agencies analyze the environmental consequences of major federal actions.

Official responsible for the EIS:

Gayle Marrs-Smith

10/7/2010

Date

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ACRONYMS AND ABBREVIATIONS

°C	Celcius
°F	Fahrenheit
AC	alternating current
ACEC	Area of Critical Environmental Concern
afy	acre-feet per year
amsl	above mean sea level
APE	Area of Potential Effect
APVE	Area of potential visual effect
BA	Biological Assessment
BAPC	Bureau of Air Pollution Control
BLM	Bureau of Land Management
BMP	Best Management Practices
BWPC	Bureau of Water Pollution Control
BWQP	Bureau of Water Quality Planning
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFATS	Chemical Facility Antiterrorism Standard
CFR	Code of Federal Register
CMI	Conservation Management Institute
CO	carbon monoxide
CO_2	carbon dioxide
CWA	Clean Water Act
dB	Decibel
dBA	A-weighted decibel
DC	direct current
DCS	Distributed Control System
DOD	U.S. Department of Defense
DOE	Department of Energy
DOI	U.S. Department of the Interior
DVRFS	Death Valley Regional Flow System
EIS	Environmental Impact Statement
EJ	environmental justice
EO	Executive Order

EPA	Environmental Protection Agency
EPAct	Energy Policy Act
EPCRA	Emergency Planning and Community Right to Know Act of 1986
ESA	Endangered Species Act
ESRI	Environmental Systems Research Institute
et seq.	"and the following"
FEMA	Federal Emergency Management Agency
FLPMA	Federal Land Policy and Management Act
FMU	Fire Management Unit
FSC	Field Supervisor Controller
GIS	geographic information system
HAZCOM	Hazard Communication
HCE	heat collection element
HMA	herd management area
HTF	heat transfer fluid
IMPLAN	Impact Analysis for Planning
IMV	Industrial Mineral Ventures
IPCC	Intergovernmental Panel on Climate Change
KOP	key observation point
kV	kilovolt
Ldn	day-night average sound exposure
LEPC	Local Emergency Planning Committee
LPG	Liquefied petroleum gas
MBTA	Migratory Bird Treaty Act
MMBtu/hr	British thermal units per hour
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NAICS	North American Industry Classification System
NBMG	Nevada Bureau of Mines and Geology
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Agency

NHPA	National Historic Preservation Act
NNHP	Nevada Natural Heritage Program
NO_2	nitrogen dioxide
NOI	Notice of Intent
NOx	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRS	Nevada Revised Statute
NV	Nevada State Route
NWR	National Wildlife Refuge
O_3	ozone
OHV	off-highway vehicle
OSHA	Occupational Safety and Health Administration
Pb	lead
PEC	Preferred Equities Corporation
PEIS	Programmatic EIS
PEL	Permissable Exposure Limit
PFYC	Potential Fossil Yield Classification
PL	Public Law
PM	particulate matter
PM_{10}	particulate matter less than 10 microns
$PM_{2.5}$	particulate matter less than 2.5 microns
POD	Plan of Development
PPE	personal protective equipment
Project	Amargosa Farm Road Solar Energy Project
Proponent	Solar Millennium, LLC
PRPA	Paleontological Resources Preservation Act of 2009
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
RMP	Resource Management Plan
RO	reverse osmosis
ROD	Record of Decision
ROI	Region of Influence
SAD	Surface Area Disturbance

SAMM	Southern Amargosa Embedded Model
SARA	Superfund Amendments and Reauthorization Act of 1986
SCA	solar collector assembly
SDWA	Safe Drinking Water Act
SEGS	Solar Energy Generating Systems
SERC	State Emergency Response Commission
SHPO	State Historic Preservation Office
SLRU	Sensitivity Level Rating Unit
SO_2	sulfur dioxide
SOI	Statement of Interest
SPCC	Spill Prevention, Control, and Countermeasure
SQRU	Scenic Quality Rating Unit
SVP	Society of Vertebrate Paleontology
SWPPP	Stormwater Pollution Prevention Plan
TDS	total dissolved solids
TWA	Time weighted average
US 95	United States Highway 95
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VEA	Valley Electric Association, Inc.
VOC	volatile organic compounds
VRI	Visual Resource Inventory
VRIC	Visual Resource Inventory Classes
VRM	Visual Resource Management
WEG	wind erodibility group
WEI	wind erodibility index
Western	Western Area Power Administration

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EXECUTIVE SUMMARY

The Pahrump Field Office of the Bureau of Land Management (BLM) has prepared this Final Environmental Impact Statement (EIS) in response to a right-of-way application submitted by Solar Millennium, LLC (Proponent) to construct and operate the Amargosa Farm Road Solar Energy Project (Project). The proposed Project includes the construction and operation of two dry-cooled solar power plants, each with a nameplate capacity of 250-megawatt (MW) and a net output of approximately 232 MW, equipped with thermal energy storage capability and associated ancillary linear facilities. Facilities located within the Project area would occupy approximately 4,350 acres and would include solar fields, power blocks, an office and maintenance building, parking area, lay-down area, switchyard, evaporation ponds and a stormwater detention basin.

The proposed Project would utilize parabolic trough solar thermal technology to produce electrical power using steam turbine generators fed by solar steam generators. The main element of a parabolic trough power plant is the solar field. The solar field consists of numerous parallel rows of solar collectors, arranged on a north-south axis. The solar collectors follow the path of the sun from east to west during the day to keep the sun's rays continuously focused on a receiver tube. The reflectors consist of parabolic mirrors made from transparent, silver-coated glass, which concentrate the incident solar radiation 80-fold, focusing it onto the receiver tube in the solar collector. The receiver tube contains a heat transfer fluid, which is temperature-stable synthetic oil in a closed circuit that can be heated to temperatures of up to 752 degrees Fahrenheit (400 degrees Celsius). Once heated, the oil is pumped to a centrally located power block, where it flows through a heat exchanger.

The remainder of the process is similar to the steam cycle used in conventional power plants. The steam produced by the heat exchanger is used to drive a turbine connected to a generator, which produces electricity to be fed into a substation. With solar thermal technology, the heat is stored (referred to as thermal storage) and used during periods of cloud cover and up to 4.5 hours after sundown.

At this time, it is anticipated the proposed Project would be built in two separate phases, with the construction of the first phase beginning in 2011, or immediately following issuance of the BLM right-of-way grant and other federal, state, and local permits and approvals. Project construction is expected to occur over a total of 39 months. The Proponent would phase construction so that the first power plant would be operational approximately one year before the second power plant becomes operational.

ES-1.1 PROJECT OVERVIEW

The proposed Project is located on BLM-administered lands, approximately 80 miles northwest of Las Vegas, in the Amargosa Valley in Nye County, Nevada (Figure ES-1). Some portions of the proposed Project would be located on private property, including a 40-acre parcel south of Amargosa Farm Road and the well and pipelines to be used to supply water to the proposed Project.

Amargosa Farm Road Solar Energy Project (NVN-84359)

Project Vicinity
Figure ES-1

LEGEND

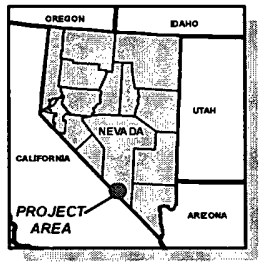
Project Area

Surface Management

- Department of Defense
- Department of Energy
- National Park Service
- US Fish and Wildlife Service
- US Forest Service

General Reference Features

- Interstate
- US Highway
- State Highway
- State Boundary
- County Boundary
- City / Town



Source: Surface Management - BLM, 2007;
Ash Meadows - USFWS, 2005;
Highways, Imagery - ESRI, 2009

February 2010

0 10 20 Miles

The Project area is located approximately 5 miles south of United States Highway 95 (US 95) and 3 miles west of NV 373. The majority of the Project area would be located north of Amargosa Farm Road, and east of Valley View Boulevard. The Proponent's initial application for a right-of-way and subsequent Plan of Development erroneously stated the area of the right-of-way to be 7,810 acres. The actual area, by legal description, is 7,630 acres.

On August 6, 2009, the Proponent sent a letter to the BLM requesting a reduction in the acreage from 7,630 acres to 6,320 acres. The Proponent's decision to release a portion of the lands from further consideration was based upon refinement of the Project layout following surveys conducted in the spring of 2009. The lands released from further consideration are shown on Figure ES-2, Project Area. The legal description of BLM-administered lands requested under the Proponent's request is provided in Table ES-1-1.

Table ES-1-1 Legal Description of Lands Requested under Proponent's Right-of-Way Application

Township (T)	Range (R)	Section/Portion
T16 South	R48 East	Sec. 1 and 12 – all
T16 South	R48 East	Sec. 2, 11, 13, and 14 – Partial Section
T16 South	R49 East	Sec. 6, 7, and 17 – all
T16 South	R49 East	Sec. 5, 8, 9, 16 18 – Partial Section

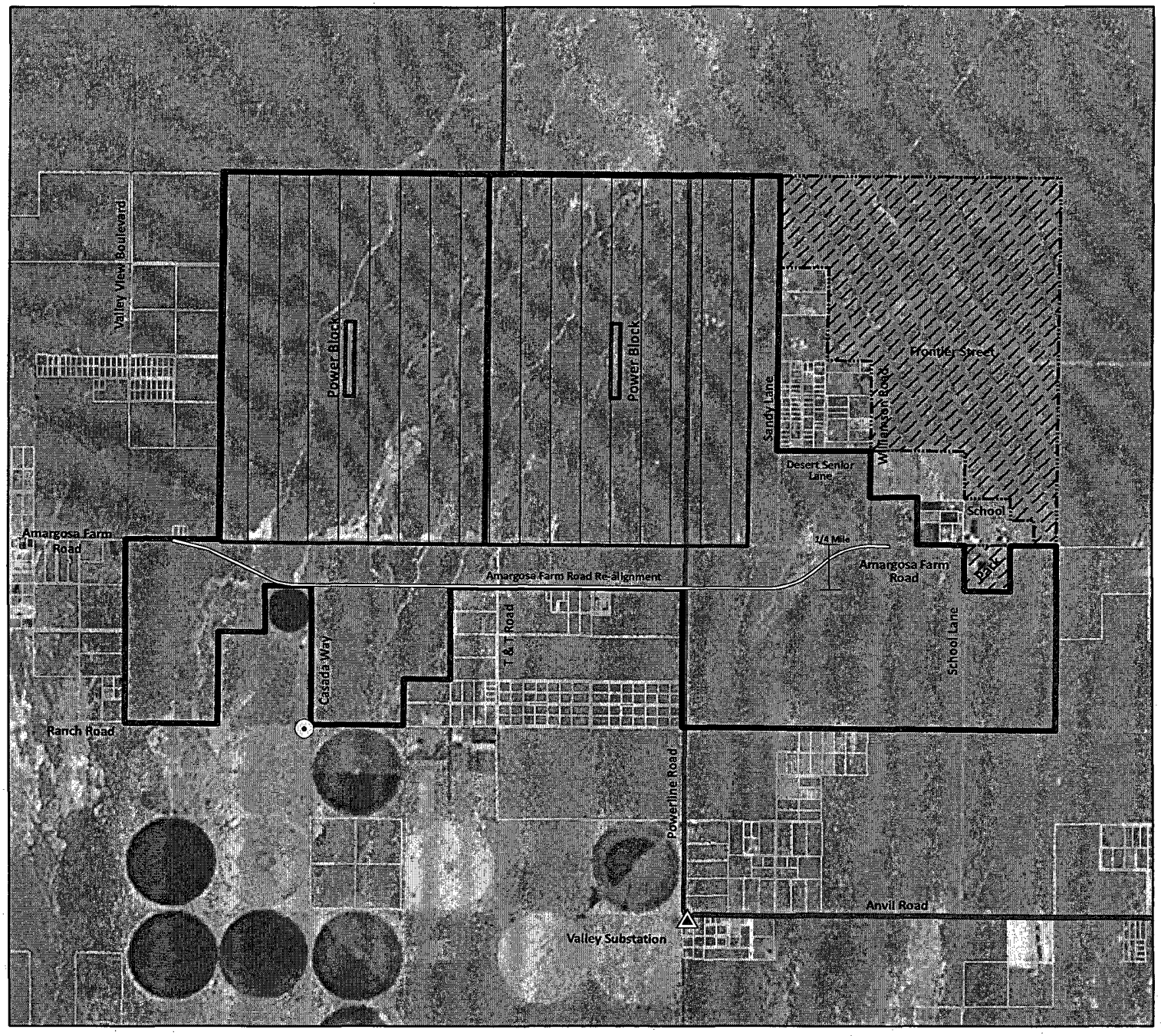
ES-1.2 PURPOSE AND NEED FOR ACTION

ES-1.2.1 Bureau of Land Management Purpose and Need

The BLM's purpose and need is to respond to Solar Millennium's application under Title V of the Federal Land Policy and Management Act (FLPMA) (43 USC § 1701-1782) for a right-of-way grant to construct, operate and decommission a 500-MW solar thermal generation facility and associated infrastructure in accordance with FLPMA, BLM right-of-way regulations (43 Code of Federal Register [CFR] Part 2800), and other applicable federal laws. The BLM will decide whether to approve, approve with modification, or deny issuance of a right-of-way grant to Solar Millennium for the proposed Project. That is, the decision the BLM will make is whether or not to grant the requested right-of-way, and if so, under what conditions.

ES-1.2.2 Proponent's Proposal

According to the 2005 Nevada Renewable Energy and Energy Conservation Task Force Annual Report to the Legislature and the Governor, Nevada utilities will need in excess of 3,000 gigawatt hours per year of new renewable energy generation capability over the next 10 years to meet the state's renewable energy needs (2005).



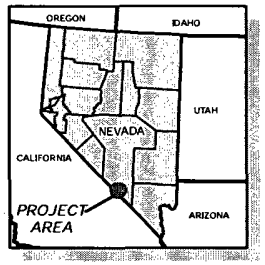
Amargosa Farm Road Solar Energy Project (NVN-84359)

Project Area Figure ES-2

LEGEND

- Initial Right-of-way Limits (November 2007)
- Revised Right-of-way Limits (August 2009)
- Lands Released from Consideration for Project
- Proposed Solar Field
- Proposed Project Well
- Existing Substation
- Existing Transmission Line (<230kV)
- Private Parcel Line

Note: The Power Block contains the steam turbine, salt storage tanks and other power generating equipment as described in the Plan of Development.



Source: Project Facilities - Solar Millennium, 2009; Wells - Nevada State Engineer, 2008; Substation, Transmission Line - Platts, 2009; Imagery - ESRI, 2009

September 2010

0 0.5 1 Miles

The State of Nevada has established a Renewable Portfolio Standard that all public utilities must meet by investing in, and partnering with, commercial project developers to purchase renewable generated power, and participate in turnkey projects and/or co-development of renewable projects. This standard mandates that 12 percent of retail sales come from renewable resources by 2009-2010; 15 percent by 2011-2012; 18 percent by 2013-2014; 20 percent by 2015-2019; 22 percent by 2020-2024; and 25 percent by 2025.

Of the total amount of electricity that the provider is required to generate, acquire, or save from renewable portfolio energy systems or efficiency measures during each calendar year, not less than 5 percent of that amount must be generated or acquired from solar renewable energy systems. Beginning in 2016, this percentage increases to 6 percent. It is expected that at least 1,000 MW of new solar power will be required annually to meet this need. Because of the intermittent nature of solar generation, there is particular interest in technologies that can expand capacity through thermal storage to help utilities balance loads.

Further, the Nevada Renewable Energy and Conservation Task Force has estimated that by increasing in-state renewable energy production to just 15 percent of the state's generation, over 5,000 new jobs could be created, with an average annual Gross State Product effect of $665 million through 2035 (2005).

Additional solar generation will also be required to meet California's needs. Under Senate Bills 1078 (2002) and 107 (2006), electric corporations must obtain 20 percent of their energy from renewable sources by 2010. On November 17, 2008, the Governor of California signed Executive Order S-14-08 which increased the requirement to 33 percent by 2020.

Following the Report of the Nevada Renewable Energy Transmission Access Advisory Committee (2009), California is examining the possibility of meeting the 33 percent Renewable Portfolio Standard requirement through out-of-state generation. To do so would assume a potential of 34 terawatts of energy routed to California from or through Nevada by 2020. This energy transfer is equivalent to approximately 12,900 MW of capacity from wind or concentrated solar power resources, assuming a 30 percent capacity factor (Nevada Renewable Energy Transmission Access Advisory Committee 2009).

The Proponent's objectives and purpose for the proposed Project are to:

- Develop a utility-scale parabolic trough solar thermal energy facility that optimizes power generation efficiency and provides energy at a reasonable and competitive cost.
- Construct and operate an environmentally compatible, economically sound, and operationally reliable solar power generation facility that will contribute approximately one million MW hours of clean, renewable solar energy per year to meet state, regional, and national renewable energy goals and mandates.
- Locate the Project in an area with high solar insolation (i.e., high intensity of solar energy) and other characteristics suitable for the development of a 500-MW solar thermal facility.

- Minimize environmental impacts, infrastructure needs, and costs by locating the plant near existing infrastructure, such as a transmission line, a substation, an adequate water supply, and highways/access roads, and by using designated corridors to the maximum extent possible.

- Develop a power-generation facility with the technical capability and flexibility to continue producing electricity when the solar resource is not optimal (i.e., during cloud cover and early evening hours) to better match the load demands of utility offtakers.

- Develop a solar thermal energy facility that will qualify for, and benefit from, the EPAct Section 1703 loan guarantee program, as well as the EPAct Section 1603 American Reinvestment and Recovery Act of 2009 Tax Grant Program if the deadline for construction under Section 1603 is extended.

- Support the economy of southern Nevada and the region by helping to ensure an adequate supply of renewable electrical energy, while creating additional tax revenues, employment, and expenditures in local businesses.

ES-1.3 PUBLIC PARTICIPATION AND AGENCY CONSULTATION

ES-1.3.1 Public Participation

Public scoping is an integral part of the NEPA process. It provides "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a Proposed Action" (40 CFR 1501.7). Initiation of the EIS process and the public scoping meetings for the proposed Project were announced through the Federal Register Notice of Intent, published on July 13, 2009 (Volume 74, Number 132, Page 33458), which marked the beginning of the public scoping period for the Project EIS.

The scoping period, required to be a minimum of 30 days, was announced as ending on August 12, 2009. Public scoping meetings were not conducted within this time period; therefore, a second notice was published in the Federal Register on September 17, 2009 (Volume 74, Number 179, Page 47820), reopening public scoping. This reopened scoping period was announced as ending on October 19, 2009.

Four scoping meetings were held from August 17 through August 24, 2009, and one information meeting, following the reopened scoping period, was held on September 22, 2009. During the public scoping period, a total of 151 comment documents were received, with a total of 1,175 comments provided. A comment document is defined as a method of response recorded as part of a public scoping transcript, email, fax, letter, or comment form. Because some documents had more than one comment, the total number of comments is greater than the number of respondents or individuals who submitted comments. A summary of comments received is provided in Chapter 1.9. Copies of the individual comments received during the scoping period are available for review at the BLM Pahrump Field Office.

The 45-day comment period for public review of the Draft EIS began with the publication of the Notice of Availability in the Federal Register on Friday, March 19, 2010. The BLM distributed press releases announcing the dates, locations, and times of the public meetings to local and regional print and broadcast media, as well as online. The Draft EIS was distributed to individuals and agencies that requested copies, and posted on BLM's website at: http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/proposed_solar_millenium.html.

Four public meetings were held during the public comment period (from March 19, 2010 – May 3, 2010) to receive comments on the Draft EIS. During the 45-day comment period, the BLM received 37 comment documents (e.g., letters, emails, faxes, etc.) from individuals, private companies, interest groups, and federal and state agencies commenting on the Draft EIS. A list of comment documents received, the content of each letter, and the BLM's responses to comments are contained in Appendix G of the Final EIS. Each comment letter was assigned a reference number, and each comment was identified with a number. Where appropriate, changes and additions are reflected in the Final EIS to respond to comments.

This Final EIS has been distributed with the publication of the Notice of Availability in the Federal Register. Copies of this Final EIS have been distributed to those parties requesting the Draft EIS, including those listed in Section 5.4. In addition, the Final EIS is available at: http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/proposed_solar_millenium.html.

ES-1.3.2 Agency and Tribal Consultation

Federal and state agencies were contacted individually to gather input for the EIS. Other resources management agencies at the federal and state levels were consulted to identify common concerns related to the Proposed Action or Alternatives. Cooperating agencies on this EIS include the U.S. Department of Defense, DOE, National Park Service, United States Army Corps of Engineers, Nevada Department of Wildlife, and Nye County. Consultations with federal, state, and local resource management and regulatory agencies, as well as interested Tribal governments are ongoing.

A Biological Assessment has been prepared for the Proposed Action and was submitted in May 2010 to the U.S. Fish and Wildlife Service (USFWS) as required by Section 7 of the Endangered Species Act of 1973 (16 USC §§ 1531-1544). A species list was requested from the USFWS which identified flora and fauna listed as threatened, endangered, or candidate that occur and have the potential to occur within the Project area and its vicinity. At the request of the USFWS, rare plant and Desert Tortoise surveys have been conducted within the Project area. Consultation with the USFWS was triggered once the Biological Assessment was submitted.

The BLM conducts consultation and coordination with American Indian Tribal governments for proposed projects that may affect their ancestral lands. On June 17, 2009 the BLM distributed formal consultation letters to the following groups:

- Pahrump Paiute Tribe
- Las Vegas Paiute Tribe
- Chemehuevi Indian Tribe

- Colorado River Indian Tribes
- Timbisha Shoshone Tribe

The notification letter informed them of six separate renewable energy projects being proposed in the Pahrump and Amargosa Valleys of Nye County, Nevada, including the proposed Project. The tribes were invited to provide input on any potential impacts to any culturally significant areas within the proposed solar project areas, including the proposed Amargosa Farm Road Project area. The Tribes were also informed of when scoping meetings were to occur if they wanted to make any project comments. A field visit with the Timbisha Shoshone Tribe was conducted on September 17, 2009. No Tribal comments opposing the Project's proposed action have been received by the BLM.

A Memorandum of Agreement between the BLM and Nevada State Historic Preservation Office (SHPO) will be completed prior to the ROD. The Memorandum of Agreement ensures that mitigation of any adverse effects to the single identified National Register of Historic Places (NRHP) eligible site will be completed under a prepared Historic Properties Treatment Plan prior to implementation of the Project in that area. If unanticipated cultural resources, human remains, or funerary items are inadvertently discovered during the Project activities, the standard procedures outlined in the 2009 State Protocol Agreement between the BLM and the Nevada SHPO would be implemented.

ES-1.4 PROPOSED ACTION AND ALTERNATIVES

ES-1.4.1 Proposed Action – Dry-Cooled Alternative

The Proposed Action alternative includes the construction and operation of a two-unit dry-cooled parabolic trough solar thermal power plant, with a nameplate capacity of 250 MW and a net output of 232 MW. The plant will consist of a conventional steam Rankine-cycle power block, a parabolic trough solar field, a heat transfer fluid and steam generation system, a nitrate salt thermal energy storage system, as well as a variety of ancillary facilities (sometimes referred to collectively as "balance-of-plant"), such as conventional water treatment, electrical switchgear, administration, warehouse, and maintenance facilities. The electric output of the plant will be provided entirely by solar energy. No electricity will be generated by the use of fossil fuels.

The Proponent's original right-of-way request of 7,630 acres was refined to include only 6,320 acres. Project facilities would only be located on approximately 4,350 acres and would include the solar fields, power blocks, an office and maintenance building, parking area, lay-down area, stormwater detention basin, evaporation ponds, and switchyard.

A land survey of the proposed right-of-way will be performed to determine the final boundary and extent of the Project area. A topographic survey was performed to obtain one-foot contours for final engineering design for grading and drainage-related requirements. A preliminary geotechnical study of the Project site will be conducted to evaluate general subsurface conditions, seismicity, and other geological hazards and to provide recommendations for design and construction of the foundations for Project structures.

As shown on Figure ES-2, the solar field will occupy the majority of the Project footprint. The final layout will be determined based on engineering design and in consideration of resource constraints and opportunities. All plant facilities will be designed, constructed, and operated in accordance with applicable laws, ordinances, regulations, and standards. All generating facilities will be located within the facility fence line. General facility dimensions for both the dry- and wet-cooled alternatives are listed in Table ES-1-2.

Table ES-1-2 Preliminary Facility Dimensions - Proposed Alternative and Wet-Cooled Alternative

Project Component	Approximate Dimensions / Acreage	Proposed Alternative (Dry-Cooled)	Wet-Cooled Alternative
Solar Fields	Two fields, Approximately 7,800 feet east-west by 11,000 feet north-south. Each field has a collector aperture area of approximately 1,970 acres.	X	X
Power Blocks	Dry-cooled – One power block located in the center of each solar field (28 acres each). Dimensions of each power block is 2,500 feet x 490 feet; tallest major structure is the air-cooled condenser at 144 feet high Wet-cooled – One power block located in the center of each solar filed (28 acres each). Dimensions of each power block is 2,500 feet x 490 feet; tallest major structure is the water-cooled condenser at 55 feet high.	X	X
Switchyard	400 feet x 400 feet (3.7 acres)	X	X
Assembly Hall/Maintenance Building	394 feet x 164 feet x 46 feet (1.5 acres)	X	X
Main Office Building	200 feet x 53 feet x 12 feet (.24 acres)	X	X
Parking Area	250 feet x 100 feet (0.5 acres)	X	X
Stormwater Detention Basin	1,200 feet x 1,200 feet (33 acres) – providing 122-acre-feet of storage assuming 4-foot-deep basin)	X	X
Evaporation Pond(s)	Dry-cooled – Two 4-acre evaporation ponds per power block (16 acres total for the project) Wet-cooled - Three 8.3 acre evaporation ponds (25 acres total for the project)	X	X
Bioremediation Area	400 feet x 800 feet (7.3 acres total for the project)	X	X
Fencing	Wind fencing on east and west side of facility: 30 feet high x approximately 11,000 feet long per side Perimeter fencing on north side of facility: 9 feet high x approximately 15,500 feet long Perimeter fencing on south side of facility: 8 feet high x approximately 17,500 feet long	X	X

Water use in a dry-cooled plant would include water for solar collector mirror washing, makeup for the solar steam generator feedwater, dust control, water for cooling plant auxiliary equipment, potable water, and fire protection. The total annual operational water usage for the dry-cooled alternative is 400 acre-feet per year (afy). During construction, approximately 600 afy will be needed. Water needed during construction and operation will be obtained from a private well located south of the Project site. On March 18, 2010, the Proponent filed Application 79699 with the Nevada State Engineer to change the manner and place of use of a portion of the water right associated with this well. In addition, the Proponent filed another application (Application 79783) on April 15, 2010 to change the point of diversion to a new well, to be located approximately 300 feet west of the existing well.

To address the National Park Service, USFWS, and BLM concerns that the proposed groundwater withdrawals associated with the proposed Project—in combination with existing withdrawals in the vicinity of Devils Hole and the Ash Meadows National Wildlife Refuge (NWR) —may adversely affect federal rights and resources, the Proponent has agreed to acquire an additional 236 afy of existing water rights within the Amargosa Desert Hydrographic Basin. The 236 afy consists of 204 afy identified as "Minimization Water Rights" (see Appendix A), and an additional 32 afy to offset the potential reduction in groundwater return flow as a result of changing the manner of use from agricultural to industrial. The acquisition of the additional 236 afy of existing groundwater in the basin will most likely be obtained from existing water rights permitted for agricultural use. At this time, it is unknown where the additional water rights will be obtained.

In addition, to ensure Project pumping does not exceed the levels indicated by the Proponent as necessary for operations, the Proponent will report water use by meters installed and operated on the points of diversions associated with the leased water right. Metering will be no less than quarterly to the Nevada State Engineer and the BLM.

ES-1.4.2 Wet-Cooled Alternative

Under the wet-cooled alternative, the Proponent would construct and operate two wet-cooled solar power plants, each with a nameplate capacity of 250-MW and a net output of approximately 242 MW. Each solar plant would be equipped with thermal storage capability and associated linear facilities. Construction and operation of a wet-cooled project would be similar to a dry-cooled plant. Plant components and layout are similar under both the wet- and dry-cooled alternatives; the primary differences are the amount of water used for plant operations, the need for cooling towers for heat rejection from the steam cycle for the wet-cooled alternative, and the larger area needed for evaporation ponds under the wet-cooled alternative. Table ES-1-2 lists the plant components for both the wet- and dry-cooled alternatives.

Water use in a wet-cooled plant would include water needed for the cooling tower to cool the steam cycle; water for solar collector mirror washing; makeup for the solar steam generator feedwater; dust control, potable water and fire protection. The average total annual water usage for the wet-cooled alternative is estimated to be approximately 4,600 afy. Under the wet-cooled alternative, the well identified for use under the dry-cooled alternative would supply a portion of

the water required for operations. However, additional water supplies would be required under the wet-cooled alternative.

The source of this additional water would be dependent on the availability of other water rights available for lease or sale in the Amargosa Desert Hydrographic Basin.

The wet-cooled alternative would provide better (i.e., more efficient) performance than the dry-cooled alternative. Specifically, the wet-cooled alternative would offer approximately 11 MW greater electrical output during peak summer ambient temperature conditions. The performance of the wet-cooled alternative is enhanced because wet-cooling relies primarily on evaporative cooling to remove heat from the circulating water.

In contrast, a dry-cooled alternative uses convective heat transfer, which operates similar to a car's radiator. In the dry-cooled alternative, an air cooled condenser using a large array of fans that force air over finned tube heat exchangers cools the steam turbine-generator exhaust steam. The disadvantages of dry-cooling are higher capital costs, higher auxiliary operating power requirements, and an overall lower plant performance, especially on hot days, when the peak power is needed most. A dry-cooled plant provides about 5 percent less electric energy on an annual basis than a wet-cooled plant because of this reduced performance on hot summer days. The cost of electricity produced by a dry-cooled plant is approximately 6 to 9 percent higher than the electricity produced by a wet-cooled plant. Thus, dry-cooling of a trough plant minimizes water use, but at a 6 to 9 percent cost penalty.

ES-1.4.3 No Action Alternative

NEPA regulations require that EIS alternative analyses "include the alternative of no action" (40 CFR §1502.14(d)). The No Action Alternative provides a useful baseline for comparison of the environmental effects of the other alternatives. For this analysis, no action means that the BLM would reject the Proponent's proposal and would not grant the requested right-of-way. Because the Project facilities would not exist, the Project's potential adverse environmental effects would not occur. However, any beneficial effects such as reduced fossil fuel use also would not occur.

ES-1.4.4 Other Alternatives Considered But Not Evaluated in Detail

In accordance with 40 CFR §1502.14, and consistent with guidance in BLM's NEPA Handbook, alternatives were not carried forward for further analysis if the alternative:

- would be ineffective (it would not respond to the BLM's purpose and need)
- would be technically or economically infeasible
- is inconsistent with the basic policy objectives of the Las Vegas Resource Management Plan
- would involve remote or speculative implementation

- is substantially similar in design to an alternative that is analyzed
- would have substantially similar effects to an alternative that is analyzed

ES-1.4.4.1 Alternative Sites

As part of its siting process, the Proponent used a refined set of criteria to screen, identify, and prioritize potential land sites for eventual solar development. Criteria include all aspects of feasibility, including the physical characteristics of the site, environmental considerations, and economic factors. Each of these criteria was applied during the screening phase for the proposed Project, which led to the selection of the current site.

These criteria included:

- **Solar Resource** – The site needs to be located where high solar insolation is available to maximize the plant's output and allow efficient utilization of the land area affected by project development. For a project to be economically viable, solar insolation levels of greater than 7 kilowatt-hours per square meter per day are desirable.
- **Size and Shape** – The site must be large enough (at least 4,000 contiguous acres) and of adequate proportions to include two 250 MW parabolic trough solar thermal plants. The shape of the site should also support an efficient and cost-effective layout of the project facilities.
- **Slope** – The site should be relatively flat, with a slope of 2 percent or less, to minimize the need for extensive grading and a large volume of cut and fill.
- **Environmental sensitivity** – The site should not be highly pristine or biologically sensitive (e.g., not within a designated wilderness area or Area of Critical Environmental Concern).
- **Availability of Infrastructure and Water** – To minimize cost and potential environmental impacts, the site should be located where water resources are available and interconnection to an existing transmission system is possible without the construction of lengthy transmission lines. In addition, the site should be in reasonable proximity to suitable transportation infrastructure to allow easier access during both construction and operation without creating the need for additional road construction.
- **Site Control** – The land must be available for sale or lease/right-of-way, at a reasonable cost and be free of conflicting encumbrances. Land with many different owners does provide adequate site control.
- **Labor Availability** – The site should be close enough to areas with large construction labor pools to maximize the number of construction workers within daily commuting range.

- **Economic Viability** – The Project must be economically viable and competitive with other renewable technology projects, including wind, geothermal, and other solar projects. To be viable, the site should be located on property currently available at a reasonable cost, be as close as possible to transmission and transportation infrastructure, and have a high solar resource value.

The selected Project site is located in an area with an excellent solar resource and is large enough to accommodate two 250 MW plants in an optimal layout. In addition, the Project site is relatively flat; is not located in any wildlife management or conservation areas; has access to transmission infrastructure and water resources; and was available for an application for a right-of-way from the BLM. Finally, the Project site allows for access to skilled labor and other industrial infrastructure from nearby Pahrump and Las Vegas.

Three alternative sites in the regional area were considered. The three sites include a site southeast of Pahrump (Sandy Hills), a site a few miles south of the proposed Project along Anvil Road in Amargosa Valley (Anvil Road), and a site near the Beatty Airport (Beatty Airport). Right-of-way applications were filed for each of these sites in 2007 and 2008. The right-of-way applications for each of these sites were ultimately withdrawn after the Proponent conducted due diligence and preliminary studies on each site and determined the alternative sites did not meet the above criteria. Table ES-1-3 summarizes the weaknesses and strengths of each of the alternative sites.

Table ES-1-3 Alternative Sites Considered

Alternative Site	Solar Resources	Size and Shape	Slope	Environmental Sensitivity	Availability of Infrastructure	Site Control
Sandy Hills Site	Yes	Yes	No	No	Yes	No
Anvil Road Site	Yes	No	Yes	Yes	Yes	No
Beatty Airport Site	Yes	No	Yes	Yes	No	Yes
Yes – Site met criteria; No – Site did not meet criteria						

The Sandy Hills site consisted of approximately 8,000 acres in Pahrump Valley approximately 20 miles southeast of Pahrump. Although the site was large enough to accommodate two 250-MW solar power plants, the site was eliminated from further consideration due to the slope of the site, as well as the existence of sensitive vegetation and wildlife, conflicting encumbrances, and water availability. Construction and operation of a solar thermal power plant at this site would result in higher environmental impacts than the Proposed Action, while not offering any offsetting advantages.

The Anvil Road site consisted of approximately 1,000 acres, located a few miles south of the selected Project site. The site was flat and had good access to transmission and water infrastructure but was too small to accommodate one 250 MW plant, let alone two of them. The Proponent explored acquiring additional private land surrounding the site but determined that the

acquisition of sufficient lands was not economically viable. Due to the number of parcels that would have to be acquired to accommodate two 250-MW solar power plants would make obtaining site control more challenging (in comparison to obtaining a right-of-way grant to use BLM lands). This, combined with the size and existing encumbrances on the site, made the site not viable.

The Beatty Airport site consisted of approximately 2,500 acres located adjacent to the Beatty Airport (approximately 35 miles north of the Project site). It was flat and had good solar resource, but it was too small for two 250 MW plants, and had existing encumbrances. The Proponent also determined that access to transmission and water would be more difficult and costly than the Project site that was ultimately selected.

During the 45-day public comment period, the BLM received several comments requesting the agency conduct a full analysis of other sites considered by the Proponent. As described above, the Proponent evaluated several sites before selecting the proposed Project site. The BLM concurred with the Proponent's conclusions to dismiss the alternative sites from further consideration.

The Proponent also considered the alternative of developing the proposed Project as a single 250 MW plant. Generally, building one plant would have fewer environmental impacts when that plant is considered in isolation. However, given the infrastructure requirements associated with building a single plant, building two plants allows for economies of scale and reduces the infrastructure impacts, including transmission access, and water development. In addition, a single 250 MW plant would be substantially less effective than two 250-MW plants in meeting renewable energy mandates and objectives, and attaining the Project objective of supporting those mandates and goals. For these reasons, the development of a smaller project was rejected.

During the scoping and the public comment periods, several comments were received requesting that the Proponent move the Project site further north, at least 0.5 to 2 miles away from existing residential or public buildings. The BLM land immediately north of the Project area has a pending solar energy development right-of-way application on file with the BLM Pahrump Field Office (Cogentrix - NVN-083150). The Proponent filed an overlapping or "second-in-line" right-of-way application on these lands (NVN-087366); however, subsequent discussions between Cogentrix and BLM staff indicate Cogentrix intends to seek approval to develop a solar energy project at this location within the next 2 to 3 years. Although the BLM's right-of-way regulations provide that conflicting applications may be resolved through a competitive process (see 43 CFR §§ 2804.23(c), 2806.50, it is unlikely that the Proponent's overlapping application could be processed in a timeframe that met the Proponent's objectives.

ES-1.4.4.2 Alternative Solar Technology

The Proponent has requested a right-of-way to construct and operate a dry-cooled, solar thermal parabolic trough project. Solar thermal parabolic trough technology has a history of successful operation in the United States. The Solar Energy Generating Systems (SEGS), located in California's Mojave Desert, is the largest solar energy generating facility in the world. It consists of nine solar power plants with an installed capacity of 354 MW. The SEGS facilities have

operated successfully over the past 30 years. Although other solar thermal technologies are under active development, none of these technologies have the construction and operating experience of parabolic trough technology. Building upon this experience base significantly reduces much of the construction and operational risk associated with a project of this magnitude. In addition, the Proponent has significant experience and expertise in siting, constructing, and operating parabolic trough plants. The Proponent is a wholly owned subsidiary of Solar Trust of America, LLC, a joint venture between Solar Millennium AG and Ferrostaal AG. Solar Millennium AG is an international developer and supplier of parabolic trough collector technology used in powering solar thermal power plants. Solar Millennium AG developed and designed the first parabolic trough power plants, Andasol 1-3, in Spain. The Andasol 1 plant began operating in December 2008, the Andasol 2 plant is currently in the commissioning phase, and the Andasol 3 plant, is currently under construction. When the entire Andasol complex is completed in 2011, it is expected to generate enough electricity to serve 150,000 Spanish households or about 600,000 people. Ferrostaal AG is a worldwide provider of industrial services and plant construction and engineering.

Although all of the SEGS and Andasol projects are wet-cooled plants, a dry-cooled alternative is the Proponent's preferred alternative. Dry-cooled technology has been used successfully on large thermal generating plants in the United States for almost 30 years dating back to its use on the 330 MW, coal-fired, Wyodak power plant in Wyoming. The largest dry-cooled power plant installation in the world, the 4,000 MW coal-fired Matimba plant in South Africa, has successfully operated for over 10 years. Dry-cooled technology has been proposed because it is a well proven technology for this scale of power generation in desert environments.

ES-1.4.5 Agency-Preferred Alternative

The BLM perferred alternative is the Proposed Action – Dry-cooled Alternative. The environmental consequences of the Proposed Action and Alternatives are summarized and compared in Table ES-1-4 below.

Table ES-1-4 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action – Dry-Cooled Alternative	Wet-Cooled Alternative	No Action Alternative
Air Quality and Climate – Sections 3.1 and 4.1		
Direct effects on air quality would occur from earthmoving activity during construction (fugitive dust, particulate matter less than 10 microns [PM_{10}] and particulate matter less than 2.5 microns [$PM_{2.5}$]) and tailpipe emissions from heavy construction equipment and worker vehicles (particulate matter, nitrogen oxide, sulfur dioxide, carbon monoxide [CO], and volatile organic compounds). The Proponent would comply with Federal and State air quality standards. Particulate emissions during construction would be temporary and mitigated through adherence to the recommended mitigation measures. The construction and operation of the solar power plant will not cause or contribute to a violation of any applicable NAAQS or Potential for Significant Deterioration (PSD) increment. The Project's operation would not cause new violations of any nitrogen dioxide, sulfur dioxide, $PM_{2.5}$ or CO ambient air quality standards.	Impacts to air quality from construction and operation of a wet-cooled solar plant would be similar to the impacts described below for the Proposed Action (dry-cooled alternative). The primary differences is the additional PM_{10} and $PM_{2.5}$ emissions from the cooling tower associated with a wet-cooled plant due to solids in the entrained moisture in the cooling tower drift.	Under the No Action Alternative, there would be no short-term construction-related exhaust or fugitive dust impacts. No impacts to air quality would occur under the No Action Alternative.
Geological Hazards and Mineral Resources – Sections 3.2 and 4.2		
The Proposed Action would not result in impacts to geological resources. However, seismic activity and ground subsidence in the region could potentially impact structures constructed and operated under the Proposed Action. All project components and facilities would be constructed in accordance with applicable regulations, engineering protocols, and safety standards to minimize potential impacts from seismic activity. The Proposed Action would not result in impacts to mineral resources, as no active claims, mines, or quarries are present within the Project area.	Impacts to geological hazards and mineral resources from construction and operation of a wet-cooled solar plant would be similar to the impacts described for the Proposed Action (dry-cooled alternative).	Under the No Action Alternative, no Project-related impacts to geological hazards or mineral resources would occur.
Soils – Sections 3.3 and 4.3		
Up to 4,350 acres of desert land will be cleared and graded to accommodate construction of the solar facility and ancillary facilities. The removal of vegetation and soil crusts would expose soil and increase the potential for wind- and water-driven erosion.	Impacts to soils from construction and operation of a wet-cooled solar plant would be similar to impacts described for the Proposed Action (dry-cooled alternative).	Under the No Action Alternative, no Project-related impacts to soil resources would occur.

Table ES-1-4 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action – Dry-Cooled Alternative	Wet-Cooled Alternative	No Action Alternative
Watering or use of BLM-approved dust suppressants is expected the reduce the potential for fugitive dust from construction activities. Site-appropriate stormwater and erosion control protection measures will be implemented during construction to reduce erosion and sedimentation. The selected erosion and sediment control BMPs and environmental protection measures would be based on the type of disturbance expected, soil type, and the location of the site relative to sensitive resources. Following construction, permanent erosion and sediment control BMPs would include continued watering for dust control, use of diversion berms, and redirection of stormwater folws into a detention/sediment or settling basin prior to discharging off-site.		
Water Resources – Sections 3.4 and 4.4		
The Proposed Action (dry-cooled alternative) would require up to 600 afy, or 1,950 acre-feet of groundwater over the 39-month construction period. During operations, water requirements would be 400 afy. The proposed source of construction and operation water is an existing well south of the Project site. The Proponent has filed an application with the Nevada State Engineers Office to change the place and manner of use of the water right. The Proponent has requested that 400 acre-feet of the 603 acre-feet annual duty is changed from agricultural to industrial use. Following approval by the Nevada State Engineer, the Proponent intends to drill a new well approximately 300 feet west of the existing well, and move 400 acre-feet from its current point of diversion to the new well. The remaining 203 acre-feet will remain with the existing well. This will allow for redundancy should one of the wells fail. During construction, the Proponent will lease the full annual duty (603 afy) from the water rights holder for the Project well. During this period, the water rights holder will fallow farmlands that were previously irrigated.	Under this alternative, the demand for water would be 4,600 afy, which is substantially more than that required for the Proposed Action. Construction-related impacts on surface and groundwater resources for this alternative would be the same as the Proposed Action (dry-cooled alternative). Plant components and layout are similar under both the wet- and dry-cooled alternatives, the primary difference being the amount of water used for plant operations, the need for cooling towers for heat rejection from the steam cycle, and the size and number of evaporation ponds. Impacts to surface and groundwater quality and jurisdictional waters would be similar to the Proposed Action. It is assumed that the water that could be acquired for the wet-cooled option would have been used on an annual basis by the current water rights owner(s) at the same volume. New wells would be drilled on-site and changes in the points of diversion, place of use and manner of use would be required to be approved by the	Under the No Action Alternative, no Project-related impacts to water resources would occur.

Table ES-1-4 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action – Dry-Cooled Alternative	Wet-Cooled Alternative	No Action Alternative
After construction, the water rights holder may continue to irrigate up to 40 acres of farmland with the 203 acre-feet assigned to the existing well. To address the NPS, USFWS, and BLM concerns that the proposed groundwater withdrawals associated with the proposed Project—in combination with existing withdrawals in the vicinity of Devils Hole and the Ash Meadows National Wildlife Refuge (NWR) — may adversely affect federal rights and resources, the Proponent has agreed to acquire an additional 236 afy of existing water rights within the Amargosa Desert Hydrographic Basin. The 236 afy consists of 204 afy identified as "Minimization Water Rights" (see Appendix A), and an additional 32 afy to offset the potential reduction in groundwater return flow as a result of changing the manner of use from agricultural to industrial. The Proponent would sign over the minimization water rights (204 afy) to Nye County upon a signed Memorandum of Understanding (MOU). Though details yet to be determined by the MOU, Nye County, in cooperation with the other MOU signatories and other appropriate agencies shall perform studies to better understand how the use of the minimization water rights would impact area resources. These include Devil's Hole, Ash Meadows, and overall local and regional water levels. The details and ultimate goals of the studies shall be agreed upon by Nye County, BLM, NPS, and USFWS. The acquisition of the additional 236 afy of existing groundwater in the basin will most likely be obtained from existing water rights permitted for agricultural use. At this time, it is unknown where the additional water rights will be obtained. The water to be used during construction will be piped from the Project well to temporary water storage tanks to be located throughout the construction site. Meters will be placed on both wells to ensure there is no exceedance of the permissible annual duty. Under the dry-cooled alternative, four 4-acre evaporation ponds will be required for boiler blowdown. The evaporation ponds would be	Nevada Division of Water Resources. Water acquisitions would be required to comply with Nevada State Engineer Ruling No. 1197 and any other Nevada state regulations and policies.	

Table ES-1-4 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action – Dry-Cooled Alternative	Wet-Cooled Alternative	No Action Alternative
double-lined and would be constructed in accordance with NDEP requirements. The section of the Fortymile Wash that traverses the Project area will be rechanneled and designed to intercept the 100-year storm event and convey the concentrated flow to historic discharge locations south of the Project site. The Proponent is coordinating these activities with the BLM, Nye County, and the United States Army Corps of Engineers. Potential impacts to water resources during construction would be primarily associated with surface disturbing activities, but could also be a result of accidental spills and handling and storage of hazardous chemicals. Mitigation measures are proposed to prevent spills of chemicals, as well as to respond to spills should they occur.		
Noise – Sections 3.5 and 4.5		
Throughout the construction of the proposed Project, temporary noise impacts are expected to briefly radiate within the defined boundaries of the Project site. Under Environmental Protection Agency guidelines for outdoor noise impacts to residential property lines, the noise impacts are considered to be less than significant and no mitigation will be required for the temporary construction operations. Operational activities of the Proposed Action were evaluated to determine the worst-case daily operational noise impacts. Under Environmental Protection Agency noise threshold guidelines, the impacts were found to be less than significant and require no mitigation. Employees working within the operational areas may be exposed to areas considered as a sensitive noise receptor location. Under Occupational Safety and Health Administration Standards the impact of worst-case calculated noise exposure levels the impacts is considered less than significant.	Impacts to noise levels from construction and operation of a wet-cooled solar plant may be similar to the impacts described for the Proposed Action (dry-cooled alternative). The noise producing mechanical equipment is situated at a lower height in a wet-cooled solar plant and, as such, may result in slight decreases in operational noise as compared to the dry-cooled alternative.	Under the No Action Alternative, no Project-related impacts to noise levels would occur.

Table ES-1-4 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action – Dry-Cooled Alternative	Wet-Cooled Alternative	No Action Alternative
Biological Resources – Sections 3.6 and 4.6		
VEGETATION RESOURCES: Up to 4,350 acres of creosote bush-dominated native vegetation will be completely cleared for the life of the project to accommodate construction of the solar facility and ancillary facilities. Construction activities could promote the proliferation of non-native invasive weeds into the Project area. In consultation with BLM biologists, the Proponent will prepare a Project-specific Weed Managmeent Plan prior to commencing construction activities. No potential habitats for federally listed threatened or endangered plant species occur within the Project area; however, two state protected cacti species are present and would need to be salvaged in accordance with NRS 527.060-120. **WILDLIFE RESOURCES:** Direct impacts on wildlife resources can result from ground disturbance caused by construction-related activities, which can impact wildlife habitat by removing vegetation, altering plant composition or structure (e.g., non-native invasive species replacing native species), causing fragmentation, loss of connectivity for wildlife, increased predation, and altering soil characteristics. Removal of vegetation, alteration of Fortymile Wash, and placement of fencing around parameter of the solar fields, could impede travel opportunities for wildlife. The Project area contains low quality, but suitable habitat for Desert Tortoise. Four old Class IV burrows were located within the Project area. Efforts will be made to ensure that the area is clear of any active burrows and all live tortoises prior to any construction being conducted. Pre-construction clearance surveys would be conducted to ensure that activities associated with the construction and operation of the Project would not cause mortality or other harm to Desert Tortoise by collapsing dens and burrows, entombing adults, eggs, and young. Mortality could also occur from collisions with equipment and	**VEGETATION RESOURCES:** Impacts to vegetation from construction and operation of a wet-cooled solar plant would be similar to the impacts described for the Proposed Action (dry-cooled alternative). Similar to the dry-cooled alternative, there would be no new groundwater pumping under the wet-cooled alternative. Water for Project construction and operations, would be obtained from existing water rights and converted to industrial use. **WILDLIFE RESOURCES:** Impacts to wildlife resources from construction and operation of a wet-cooled solar plant would be similar to the impacts described for the Proposed Action (dry-cooled alternative). The primary difference would be the number and size of evaporation ponds for each alternative. Under the wet-cooled alternative, three 8.3 acre evaporation ponds would be needed. Similar to the dry-cooled alternative, there would be no new groundwater pumping under the wet-cooled alternative. Water for Project construction and operations, would be obtained from existing water rights and converted to industrial use. New wells would be drilled on-site and changes in the points of diversion, place of use and manner of use would be required to be approved by the Nevada Division of Water Resources.	Under the No Action Alternative, no direct Project-related impacts to biological resources would occur.

Table ES-1-4 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action – Dry-Cooled Alternative	Wet-Cooled Alternative	No Action Alternative
vehicles. Predation could increase as construction displaces wildlife from protected cover to uncovered habitat. Direct impacts on Desert Tortoise can result from loss of tortoise habitat; including loss of old burrow sites, located in the northwest quarter of the Project area. Construction activities may impact suitable habitat for nesting and burrowing birds including Burrowing Owl, a BLM Sensitive species and a Nevada animal species considered to be at risk in all counties in Nevada. Old burrowing Owl burrows were found in the Project area. For other nesting bird species, direct impacts could include eliminating potential nesting habitat and loss of individuals. The Migratory Bird Treaty Act applies to species that would be impacted during the construction phase of the Project. There would be direct impacts to LeConte's Thrasher by eliminating suitable nesting habitat. Loss of native vegetation would directly impact at least 12 snake and lizard species that were found in the Project area. Two such species include, Desert Iguana, included on the Nevada Natural Heritage Program Animal Watch List, and Nevada Shovel-nosed Snake, included as a conservation priority species in Nevada. Under the dry-cooled alternative, four 4-acre evaporation ponds will be required for boiler blowdown. Evaporation ponds would introduce a potential threat to wildlife. Since the tortoise-proof perimeter fencing will restrict most terrestrial wildlife from entering the plant site, it is anticipated that birds will face the greatest potential risk from constituents in the evaporation ponds. Species at risk are those with the potential for nesting at the facility, residents of the area that would drink and forage from the ponds or feed on insects associated with the ponds, and migrants that would use the ponds for a stopover during migration. To reduce the potential for impacts from the ponds, the ponds would be placed within the existing Project footprint, would be double-lined, and covered with narrow-mesh netting to prevent access by ravens and migratory birds in accordance with applicable regulations. Additionally, the operational design of the ponds will make it difficult for perching birds and/or shorebirds to access the		

Table ES-1-4 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action – Dry-Cooled Alternative	Wet-Cooled Alternative	No Action Alternative
water.		
Historic and Cultural Resources – Sections 3.7 and 4.7		
Sixteen cultural resource sites were identified within the Area of Potential Effects of the Proposed Action. Only one site has been determined eligible for listing on the NRHP under Criterion D. Direct effects to this site could occur as a result of ground disturbing activities associated with the construction of the proposed Project. An Historic Properties Treatment Plan describing the mitigation measures that would be employed to resolve any adverse effect to the one NRHP eligible site has been prepared. A Memorandum of Agreement between the BLM and Nevada State Historic Preservation will be implemented to ensure the Historic Properties Treatment Plan will mitigate any adverse effect to the single NRHP-eligible site. Treatment of the site would occur prior to any project implementation. If unanticipated cultural resources, human remains, or funerary items are inadvertently discovered during Project activities, the standard procedures outlined in the 2009 State Protocol Agreement between the BLM and the Nevada SHPO would be implemented.	Impacts to cultural resources from construction and operation of a wet-cooled solar plant would be similar to the impacts described for the Proposed Action (dry-cooled alternative).	Under the No Action Alternative, no Project-related impacts to cultural resources would occur.
Paleontological Resources – Sections 3.8 and 4.8		
No paleontological localities have been identified within the Project area. The two geological units present in the Project area both have a low potential for containing paleontological resources. There would be no impacts to paleontological resources as a result of operation or maintenance of the components or facilities under the Proposed Action.	Impacts to paleontological resources from construction and operation of a wet-cooled solar plant would be similar to the impacts described for the Proposed Action (dry-cooled alternative).	Under the No Action Alternative, no Project-related impacts to paleontological resources would occur.
Socioeconomic Resources – Sections 3.9 and 4.9		
Construction of the proposed Project would last 39 months. Construction is expected to directly create an average of about 650 annual full-time employment over 39 months, with a peak monthly	Socioeconomic effects under the wet-cooled alternative would be the same as the Proposed Action (dry-cooled alternative).	Under the No Action Alternative, the right-of-way would not be granted. However,

Table ES-1-4 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action – Dry-Cooled Alternative	Wet-Cooled Alternative	No Action Alternative
employment of approximately 1,300 full-time employees. Operation is anticipated to employ between 170 to 200 full-time employees. This direct employment will create both indirect and induced secondary employment in the regional area. For all projects in the region, temporary housing facilities would be needed and the added population during construction could place a burden on local social and public services. The construction payroll has been estimated at approximately $58.6 million annually over the 39 period. Capital expenditures and local spending on construction materials and equipment within the Region of Influence are estimated to total approximately $50 to $75 million annually. During construction, the proposed Project could generate up to $30 million in property taxes, and pay approximately $35 million in sales tax to the State of Nevada for the Local School Support Tax. During operation, it is expected that the annual purchases for materials supplies, equipment, and services delivered and purchased within the Region of Influence would total approximately $16.9 million. For example, if all purchases are delivered to and made within Nye County, which has a current tax rate of 7.1 percent, these expenditures would generate approximately $1.2 million in annual sales tax revenue.		the land on which the Project is proposed would become available to other uses that are consistent with BLM's land use plan, including another renewable energy project. The beneficial impact on the regional economy from construction and operation of the proposed Project would not occur.
Environmental Justice – Sections 3.10 and 4.10		
Potential direct and indirect impacts associated with the Proposed Action would not have a disproportionate effect on low-income or minority populations. There are no special issues, such as housing, transportation, access, or resource use in the Project area that would affect the environmental justice (EJ) population disproportionately.	Impacts to EJ under the wet-cooled alternative would be same as those described under the Proposed Action (dry-cooled alternative).	Under the No Action Alternative, no Project-related impacts to EJ would occur.

Table ES-1-4 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action – Dry-Cooled Alternative	Wet-Cooled Alternative	No Action Alternative
Land Use, Recreation, Transportation and Access – Sections 3.11 and 4.11		
LAND USE: Construction and operation of the Proposed Action would permanently disturb approximately 4,350 acres, and would make this acreage unavailable to be developed for other uses. No residential, commercial, or industrial land uses would be directly impacted by construction or operation of the proposed Project. **TRANSPORTATION AND ACCESS:** The proposed Project would have short-term impacts on traffic flows and volumes on area roadways. Increased construction traffic on local unimproved roads may contribute to road deterioration and mitigative actions may be required. No access to commercial or residential areas would be restricted; however construction activity could potentially delay users' daily commute times within the Valley's transportation network. Scheduling contruction activities could mitigate those delays. Operation of the Proposed Action would have long-term, cumulative impacts on traffic flows and volumes on roadways when combined with the other proposed energy projects and the commercial activity associated with increased industry in the area. All disturbance areas not covered by project facilities would be reclaimed in accordance with BLM protocols. **RECREATION and SPECIAL MANAGEMENT AREAS:** The proposed Project would not preclude the use of recreation and special management areas, but would remove land currently available for dispersed recreation on the Project site. Operation and maintenance of the Project facilities would not limit public access to recreation opportunities in the surrounding area.	Impacts to land use, recreation, transportation, and access under the wet-cooled alternative would be the same as those described under the Proposed Action (dry-cooled alternative).	Land use would not change on federal lands. However, land use changes could continue on adjacent private lands. Under the No Action Alternative, no Project-related impacts to transportation and access would occur. Under the No Action Alternative, no Project-related impacts to Areas of Critical Environmental Concern wilderness, or other special use areas would occur. No project-related impacts to recreational use of public lands would occur.
Visual Resources – Sections 3.12 and 4.12		
Visual impacts would occur during the construction of the proposed Project based on the introduction of construction equipment, higher	Impacts to visual resources under the wet-cooled alternative would be similar to those described for the	Under the No Action Alternative, no Project-related

Table ES-1-4 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action – Dry-Cooled Alternative	Wet-Cooled Alternative	No Action Alternative
levels of traffic, potential fugitive dust, and new forms of night lighting in the foreground distance zone of high sensitivity residential viewers along Sandy Lane and adjacent to Valley View Estates. Long term impacts would be based on the introduction of moderate/strong visual contrast associated with Project components (e.g., solar troughs, power block, transmission lines, and ancillary buildings) within a rural to natural setting that would be visible to moderate and high sensitivity viewers. The majority of long term impacts are anticipated to range from low to moderate based on the relatively low profile of the Project and the occurrence of various existing landscape features (i.e., topography, mature vegetation, and structures associated with the town of Amargosa Valley) that would screen the Project and reduce contrast from moderate and high sensitivity viewers. Limited occurrences of high impacts would occur where moderate to high sensitivity viewers would have unobstructed views of the Project in the foreground distance zone (i.e., Sandy Lane and Valley View Estates residences). Potential effects to dark-sky that would result from the nighttime operations of the Project are anticipated. Compliance is anticipated with BLM Visual Resource Management Class IV objectives.	Proposed Action with the following exception. Because a wet-cooling unit is less than half the height of a dry-cooled unit, the contrast for key observation points with views of the power block would be less visible to sensitive viewers under the wet-cooled alternative. High impacts would remain for residences located along Sandy Lane and within Valley View Estates; however, impacts would be reduced for all other identified sensitive viewers and residences with views of the Project area.	impacts to visual resources would occur as no project facilities would be constructed on BLM lands.
Health and Safety/Hazardous Materials – Sections 3.13 and 4.13		
Potential wastes that could be generated at the site include domestic non-hazardous solid waste, hazardous wastes or materials, and used wastes that can be recycled. These types of substances, materials, and wastes most likely would be present during stages of construction, development, and operation of the facility. During all stages of plant construction and operation, strict compliance with all federal, state, and local regulations governing the management of hazardous materials is required by law.	Impacts from hazardous materials and solid waste under the wet-cooled alternative would be same as those described under the Proposed Action.	There would be no Project-related hazardous materials or solid waste produced under the No Action Alternative.

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CHAPTER 1 - INTRODUCTION, PURPOSE AND NEED

1.1 INTRODUCTION

In Executive Order (EO) 13212 of May 18, 2001 (Actions to Expedite Energy-related Projects), President George W. Bush ordered that executive departments and agencies take appropriate actions "to expedite projects that will increase the production, transmission, or conservation of energy." Section 211, of the Energy Policy Act of 2005 (EPAct). (Public Law [PL] 109-58) states "...that the Secretary of the Interior should, before the end of the 10-year period beginning on enactment of this Act, seek to have approved non-hydropower renewable energy projects located on public land with a generation capacity of at least 10,000 megawatts (MW) of electricity."

According to the U.S. Department of the Interior (DOI), federal public lands offer some of the highest renewable energy potential in the nation. The DOI manages 500 million acres of land, one-fifth of the land mass of the United States. On March 11, 2009, Secretary of the Interior Ken Salazar issued a Secretarial Order that made facilitating the production, development, and delivery of renewable energy on public land a top priority for the DOI. Within the DOI, the Bureau of Land Management (BLM) administers approximately 253 million acres of public land in the United States. The BLM has identified approximately 23 million acres in the Southwest as containing high solar energy potential.

The BLM Solar Energy Development Policy establishes a framework to process applications for rights-of-way, and directs the BLM to be responsive to solar energy project applicants, while maintaining its commitment to resource protection. In 2007, the BLM issued Instruction Memorandum Number 2007-097, which established policy for the processing of right-of-way applications for solar energy development projects on public land administered by the BLM. Under this policy, the BLM strives to balance the financial and social benefits from solar energy development with minimizing impacts to other resources.

According to the 2005 Nevada Renewable Energy and Energy Conservation Task Force Annual Report to the Legislature and the Governor, Nevada utilities will need in excess of 3,000 gigawatt hours per year of new renewable energy generation capability over the next 10 years to meet the state's renewable energy needs. The State of Nevada has established a Renewable Portfolio Standard that all public utilities must meet by investing in, and partnering with, commercial project developers to purchase renewable generated power, and participate in turnkey projects and/or co-development of renewable projects. This standard mandates that 12 percent of retail sales come from renewable resources by 2009-2010; 15 percent by 2011-2012; 18 percent by 2013-2014; 20 percent by 2015-2019; 22 percent by 2020-2024; and 25 percent by 2025.

Of the total amount of electricity that the provider is required to generate, acquire, or save from renewable portfolio energy systems or efficiency measures during each calendar year, not less than 5 percent of that amount must be generated or acquired from solar renewable energy systems. Beginning in 2016, this percentage increases to 6 percent. It is expected that at least 1,000 MW of new solar power will be required annually to meet this need. Because of the

intermittent nature of solar generation, there is particular interest in technologies that can expand capacity through thermal storage, in order to help utilities balance loads.

Further, the Nevada Renewable Energy and Conservation Task Force has estimated that by increasing in-state renewable energy production to just 15 percent of the state's generation, over 5,000 new jobs could be created, with an average annual Gross State Product effect of $665 million through 2035 (2005).

Additional solar generation will also be required to meet California's needs. Under Senate Bills 1078 (2002) and 107 (2006), electric corporations must obtain 20 percent of their energy from renewable sources by 2010. On November 17, 2008, the Governor of California signed Executive Order S-14-08 which increased the requirement to 33 percent by 2020. Following the Report of the Nevada Renewable Energy Transmission Access Advisory Committee (July 1, 2009), California is examining the possibility of meeting the 33 percent Renewable Portfolio Standard requirement through out-of-state generation. To do so would assume a potential of 34 terawatts of energy routed to California from or through Nevada by 2020. This energy transfer is equivalent to approximately 12,900 MW of capacity from wind or concentrated solar power resources, assuming a 30 percent capacity factor.

Solar Millennium, LLC (Proponent) is pursuing economic stimulus funding for the proposed Project under Section 1703 of the EPAct. Section 1703 authorizes loan guarantees for renewable energy projects and certain other projects. To be eligible for a loan guarantee under Section 1703, a project must "avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gasses" and "employ new or significantly improved technologies" in comparison to commercial technologies currently used in the United States. A loan guarantee would reduce the cost financing required for the Amargosa Farm Road Solar Energy Project (Project), and therefore the gross Project cost over the Project's lifetime. In addition, the Proponent may pursue funding under Section 1603 of the EPAct, which was established pursuant to the American Reinvestment and Recovery Act of 2009 (PL No. 111-5). Section 1603 provides a 30 percent tax grant for eligible renewable energy projects that commence construction by the end of 2010. The U.S. Congress may extend this deadline.

1.2 PROJECT OVERVIEW

The Proponent submitted a right-of-way application to the BLM Pahrump Field Office to construct and operate the proposed Project on BLM-managed land in Amargosa Valley, Nevada.

The proposed Project includes the construction and operation of two 250-MW dry-cooled solar power plants equipped with thermal energy storage capability and associated ancillary linear facilities. Facilities located within the Project area would occupy approximately 4,350 acres and would include solar fields, power blocks, an office and maintenance building, parking area, lay-down area, switchyard, evaporation ponds, and a stormwater detention basin. Additional elements of the proposed Project would include access roads and optional water pipelines.

The Proponent's proposed Project would utilize parabolic trough solar thermal technology to produce electrical power using steam turbine generators fed by solar steam generators. The main element of a parabolic trough power plant is the solar field. The solar field consists of numerous

parallel rows of solar collectors, arranged on a north-south axis. The solar collectors follow the path of the sun from east to west during the day to keep the sun's rays continuously focused on a receiver tube. The reflectors consist of parabolic mirrors made from transparent, silver-coated glass, which concentrate the incident solar radiation 80-fold, focusing it onto the receiver tube in the solar collector. The receiver tube contains a heat transfer fluid (HTF), which is a temperature-stable synthetic oil in a closed circuit that can be heated to temperatures of up to 752 degrees Fahrenheit (°F) (400 degrees Celsius [°C]). Once heated, the oil is pumped to a centrally located power block, where it flows through a heat exchanger.

The remainder of the process is similar to the steam cycle used in conventional power plants. The steam produced by the heat exchanger is used to drive a turbine connected to a generator, which produces electricity to be fed into a substation. The steam in the turbine condenses back into the water and the water is re-circulated through the solar field. With solar thermal technology, the heat is stored (referred to as thermal storage) and used during periods of cloud cover and up to 4.5 hours after sundown.

At this time, it is anticipated the proposed Project would be built in two separate phases, with the construction of the first phase beginning in 2011, or immediately following issuance of the BLM right-of-way grant and other federal, state, and local permits and approvals. The Proponent would phase construction so that the first power plant would be operational approximately 1 year before the second power plant becomes operational.

1.3 PROJECT LOCATION

The proposed Project is located on BLM-administered lands, approximately 80 miles northwest of Las Vegas, in the Amargosa Valley in Nye County, Nevada (Figure 1-1). Some portions of the proposed Project would be located on private property, including a 40-acre parcel south of Amargosa Farm Road and the well and pipelines to be used to supply water to the proposed Project.

The Project area is located approximately 5 miles south of United States Highway 95 (US 95) and 3 miles west of Nevada State Route (NV) 373. The majority of the proposed Project area would be located north of Amargosa Farm Road, and east of Valley View Boulevard. The initial right-of-way application and subsequent Plan of Development (POD) erroneously stated the area of the right-of-way to be 7,810 acres. The actual area, by legal description, is 7,630 acres. On August 6, 2009, the Proponent sent a letter to the BLM requesting a reduction in the acreage from 7,630 acres to 6,320 acres. The Proponent's decision to release a portion of the requested lands from further consideration was based upon refinement of the Project layout following surveys conducted in the spring of 2009. The lands released from further consideration are shown on Figure 1-2.

Amargosa Farm Road Solar Energy Project (NVN-84359)

Project Vicinity
Figure 1-1

LEGEND

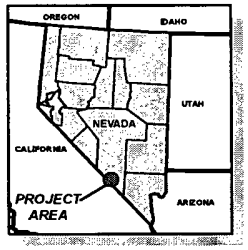
Project Area

Surface Management

- Department of Defense
- Department of Energy
- National Park Service
- US Fish and Wildlife Service
- US Forest Service

General Reference Features

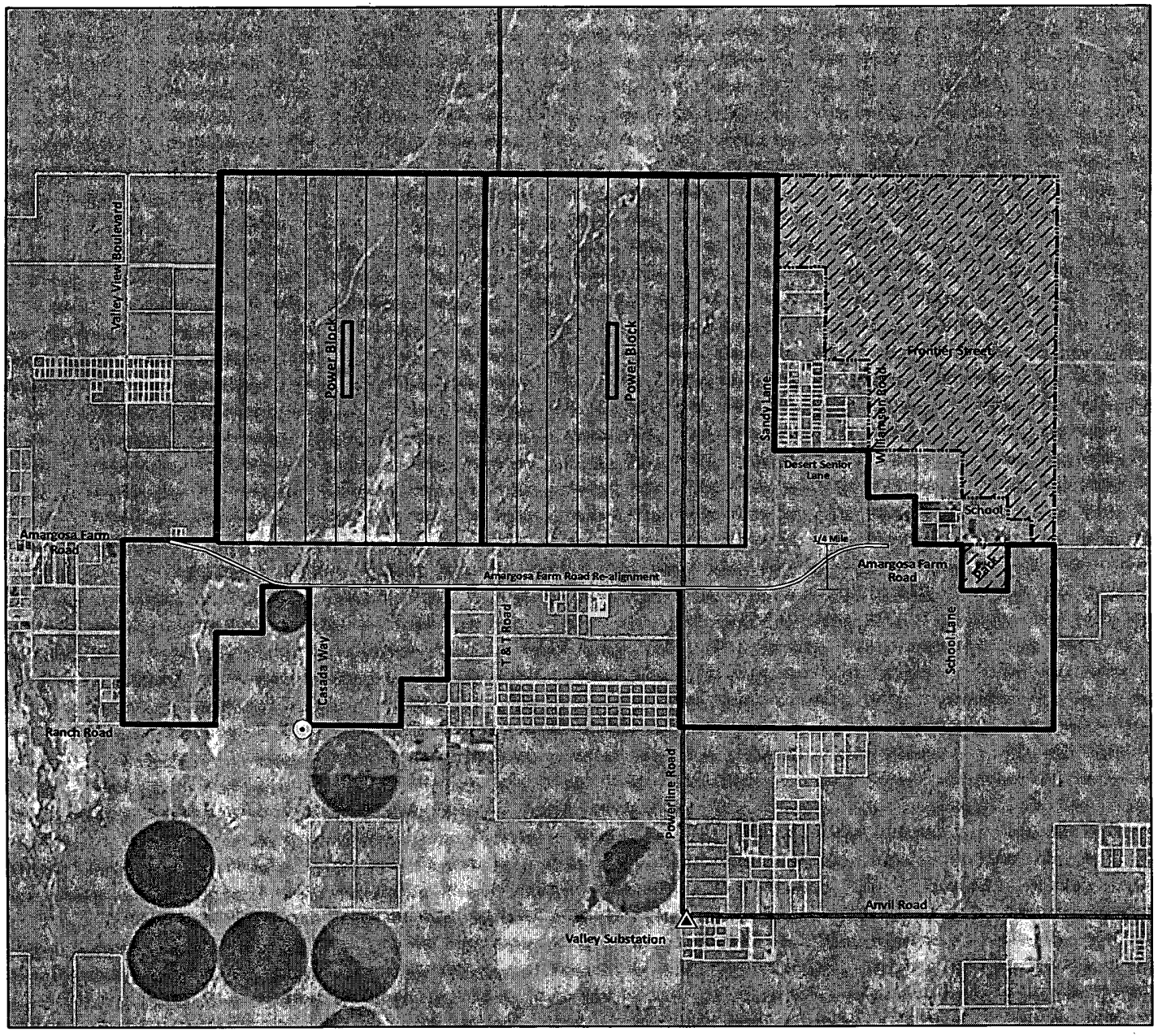
- Interstate
- US Highway
- State Highway
- State Boundary
- County Boundary
- City / Town



Source: Surface Management - BLM, 2007; Ash Meadows - USFWS, 2005; Highways, Imagery - ESRI, 2009

February 2010

0 10 20 Miles



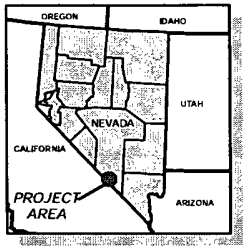
Amargosa Farm Road Solar Energy Project (NVN-84359)

Project Area Figure 1-2

LEGEND

- Initial Right-of-way Limits (November 2007)
- Revised Right-of-way Limits (August 2009)
- Lands Released from Consideration for Project
- Proposed Solar Field
- Proposed Project Well
- Existing Substation
- Existing Transmission Line (<230kV)
- Private Parcel Line

Note: The Power Block contains the steam turbine, salt storage tanks and other power generating equipment as described in the Plan of Development.



Source: Project Facilities - Solar Millennium, 2009; Wells - Nevada State Engineer, 2008; Substation, Transmission Line - Platts, 2009; Imagery - ESRI, 2009

September 2010

0 0.5 1 Miles

Table 1-1 Legal Description of Proposed Project		
Township (T)	**Range (R)**	**Section/Portion**
T16 South	R48 East	Sec. 1 and 12 – all
T16 South	R48 East	Sec. 2, 11, 13, and 14 – Partial Section
T16 South	R49 East	Sec. 6, 7, and 17 – all
T16 South	R49 East	Sec. 5, 8, 9, 16 18 – Partial Section

1.4 PURPOSE AND NEED FOR ACTION

1.4.1 Bureau of Land Management Purpose and Need

The BLM's purpose and need is to respond to the Proponent's application under Title V of the Federal Land Policy and Management Act (FLPMA) (43 United States Code [USC] § 1701-1782) for a right-of-way grant to construct, operate and decommission a 500 MW solar thermal generation facility and associated infrastructure in accordance with FLPMA, BLM right-of-way regulations (40 Code of Federal Register [CFR] Part 2800), and other applicable federal laws. The BLM will decide whether to approve, approve with modification, or deny issuance of a right-of-way grant to the Proponent for the proposed Project. That is, the decision the BLM will make is whether or not to grant the requested right-of-way, and if so, under what conditions.

1.4.2 Proponent's Proposal

The Proponent's objectives and purpose of the proposed Project are to:

- Develop a utility-scale parabolic trough solar thermal energy facility that optimizes power generation efficiency and provides energy at a reasonable and competitive cost.
- Construct and operate an environmentally compatible, economically sound, and operationally reliable solar power generation facility that will contribute approximately one million MW hours of clean, renewable solar energy per year to meet state, regional, and national renewable energy goals and mandates.
- Locate the Project in an area with high solar insolation (i.e., high intensity of solar energy) and other characteristics suitable for the development of a 500-MW solar thermal facility.
- Minimize environmental impacts, infrastructure needs, and costs by locating the plant near existing infrastructure, such as a transmission line, a substation, an adequate water supply, and highways/access roads, and by using designated corridors to the maximum extent possible.

- Develop a power-generation facility with the technical capability and flexibility to continue producing electricity when the solar resource is not optimal (i.e., during cloud cover and early evening hours) to better match the load demands of utility offtakers.
- Develop a solar thermal energy facility that will qualify for, and benefit from, the EPAct Section 1703 loan guarantee program, as well as the EPAct Section 1603 American Reinvestment and Recovery Act of 2009 Tax Grant Program, if the deadline for construction under Section 1603 is extended.Support the economy of southern Nevada and the region by helping to ensure an adequate supply of renewable electrical energy, while creating additional tax revenues, employment, and expenditures in local businesses.

1.5 SCOPE OF ANALYSIS

The NEPA process consists of an evaluation of the environmental effects of a federal project or action undertaking. Under NEPA, federal agencies must consider the environmental effects of their actions. NEPA directs federal agencies to "utilize a systematic, interdisciplinary approach ... in planning and decision-making, which may have an impact on man's environment," to ensure that environmental amenities and values ... be given appropriate consideration in decision-making along with economic and technical considerations," and to "study, develop, and describe appropriate alternatives to recommended courses of action.." This mandate applies to all "major federal actions" (Title 43, Part 1500 CFR). As a result, NEPA affects most decisions regarding the use of public lands.

The preparation of an EIS follows a highly formalized process, consisting of eight major steps:

1. Issue the Notice of Intent (NOI) to prepare an EIS
2. Conduct public and agency scoping
3. Prepare the interdisciplinary analysis of the issues and alternatives
4. Issue the Draft EIS
5. Conduct the public review and comment period
6. Issue the Final EIS, which includes responses to comments on the Draft EIS
7. 30-day waiting period
8. Issue the ROD

1.5.1 The Environmental Impact Statement Decision Framework

This EIS analyzes and discloses the environmental impacts of the proposed Project, as well as alternatives chosen by the BLM as detailed in Chapter 2. The EIS provides an analysis of impacts that would result from the implementation of the proposed Project or alternatives. The EIS process is designed to encourage public participation in the BLM's decision-making process and identifies mitigation measures to address environmental consequences.

1.5.2 Decisions to be Made After this Environmental Impact Statement

In the EIS, in addition to the proposed Project (Proposed Action), several alternatives to the proposed Project are identified and analyzed. The decisions made regarding the Proposed Action and alternatives will be documented in a ROD signed by the authorized officer. The BLM decision will only apply to public lands.

Within the ROD, the authorized officer will determine whether:

- the analysis contained in this EIS is adequate for the purposes of reaching an informed decision regarding authorizing a right-of-way
- to approve the Proposed Action, select a different alternative, select a combination of alternatives, or deny the right-of-way request
- the Proposed Action and alternatives are in conformance with applicable land and resource management plans (RMP)

1.6 RELATIONSHIP TO BLM AND NON-BLM POLICIES, PLANS, AND PROGRAMS

If approved, the Proposed Action must be consistent with the BLM Las Vegas RMP/EIS, approved by a ROD dated October 5, 1998 (BLM 1998). The RMP/EIS has been reviewed and it is determined the proposed Project conforms with adopted management objectives and directions as summarized in the RMP and the ROD under the authority of the FLPMA of October 21, 1976, as amended (43 USC §§1701-1782).

This EIS was prepared in compliance with: CEQ regulations for implementing the NEPA (40 CFR §§ 1500-1508; 43 CFR Part 46); the BLM NEPA Handbook, H-1790-1; FLPMA Sections 201, 202, and 206 (43 USC §§ 1711, 1712, 1716; see also 43 CFR § 1600 et seq.); and the BLM Land Use Planning Handbook (BLM Handbook H-1601-1). The BLM also has Instruction Memorandum 2004-105, 149, 231, and 2005-105, which set NEPA compliance policy for the BLM.

Applications for commercial solar energy facilities on BLM-administered lands are processed as a right-of-way authorization under Title V of FLPMA. Title V states that, in "designating right-of-way corridors and in determining whether to require that the right-of-way be confined to them, [BLM] shall take into consideration national and state land use policies, environmental quality, economic efficiency, national security, safety, and good engineering and technological practices." FLPMA further directs that each right-of-way permit contain terms and conditions to protect federal property and economic interests, protect lives and property, and otherwise protect the public interest in the lands traversed by the right-of-way or adjacent to them (43 USC § 1765).

Table 1-2 is a representative list of federal, state, and local laws, statutes, and EOs that may apply to the siting, construction and operation of the proposed Project. If the Project were approved, the Proponent and its contractors would comply with requirements set forth in these directives, as applicable.

Table 1-2 Laws, Statutes, Regulations, and Executive Orders with which the Proposed Action and All Alternatives Must Conform
Federal Statutes
American Indian Religious Freedom Act of 1978 (PL 95-341; 42 USC 1996)
Archaeological and Historic Data Preservation Act of 1974 (PL 86-253, as amended by PL 93291; 16 USC 469)
Archaeological Resources Protection Act of 1979 (PL 96-95; 16 USC 470aa-mm)
Bald and Golden Eagle Protection Act of 1940 (16 USC 668-668d, 54 Stat. 250) as amended (PL 95-616 [92 Stat. 3114]) November 8, 1978
Clean Air Act of 1990 (as amended by PL 92-574; 42 USC 4901)
Federal Water Pollution Control Act (Clean Water Act) (33 USC 1251-1387)
Department of Transportation Act of 1966, (PL 89-670; 49 USC Section 303)
Endangered Species Act of 1973 (ESA) (PL 85-624; 16 USC 1531-1544)
EPAct of 2005 (PL 109-58)
Farmland Protection Policy Act (PL 97-98 and 7 CFR Part 658)
FLPMA of 1976, Section 201(a) (PL 94-579; 43 USC 1701 et seq.)
Federal Water Pollution Control Act of 1972, Section 404 (PL 92-500; 33 USC 1344, as amended)
Historic Sites Act of 1935 (PL 292-74; 16 USC 461-467)
Land and Water Conservation Fund Act of 1965 (PL 88-578)
Migratory Bird Treaty Act of 1918 (MBTA) (16 USC 703-712, as amended)
NEPA of 1969 (PL 91-190; 42 USC 4321; 43 CFR Part 46)
National Historic Preservation Act of 1966 (NHPA), Section 106, (PL 89-665; 16 USC 407(f)
Native American Graves Protection and Repatriation Act of 1990 (PL 101-601)
Paleontological Resources Preservation Act 2009 (PRPA) (PL 111-11; 16 USC 470aaa)
Executive Orders
EO 11296 Flood Hazard Evaluation Guidelines
EO 11514 Protection and Enhancement of Environmental Quality
EO 11593 Protection and Enhancement of the Cultural Environment
EO 11988 Floodplain Management (43 CFR 6030)
EO 11990 Protection of Wetlands
EO 12898 Federal Actions to address Environmental Justice (EJ) in Minority Populations and Low-income Populations

Table 1-2 Laws, Statutes, Regulations, and Executive Orders with which the Proposed Action and All Alternatives Must Conform
EO 13007 Indian Sacred Sites
EO 13186 Responsibilities of Federal Agencies to Protect Migratory Birds
EO 13212 Actions to Expedite Energy-related Projects
EO 13287 Preserve America
EO 123772 Intergovernmental Review of Federal Programs
Federal Regulations
40 CFR Parts 1500-1508 CEQ implementation of the NEPA
33 CFR 320-331 and 40 CFR Part 230, Section 404 of the Clean Water Act (CWA) and its Implementing Regulations
36 CFR Part 800, as amended, Protection of Historic Properties
7 CFR Part 658, as amended, Prime and Unique Farmlands
43 CFR Part 2800, as amended, Right-of-way Principles and Procedures
State Laws and Statutes
NAC 503.015-104 Classifcation and Taking of Wildlife
NRS 527.060-120 Protection and Preservation of Timbered Lands, Trees, and Flora – Definitions Cactus and Yucca
NRS 527.270 List of species declared to be threatened with extinction; special permit required for removal or destruction
NRS 503.584-589 Protection and Propagation of Native Fauna
NRS 503.430 Water pollution: Deposit of substance deleterious to fish or wildlife; penalties
NRS 503.597 Introduction or removal of aquatic life or wildlife: Approcal required; investigation; regulations
NRS 503.620 Protection of birds included in the MBTA
NRS 533.030 Adjudication of Vested Water Rights; Appropriation of Public Waters – Appropriation for beneficial use; use for recreational purpose declared beneficial; limitations and exceptions
NRS 533.035 Adjudication of Vested Water Rights; Appropriation of Public Waters – Beneficial use; Basis, measure and limit of right to use
NRS 534.020 Underground waters that belong to the public and are subject to appropriation for beneficial use; declaration of legislative intent
NRS 555.005 Agriculture – Control of Insects, Pests, and Noxious Weeds, Definitions
Definitions: NAC – Nevada Administrative Code; NRS – Nevada Revised Statute; et seq. – "and the following"

The Proponent, or its designees, is responsible for applying for and acquiring the federal, state, and local permits and approvals listed in Table 1-3.

Table 1-3 Authorizations, Permits, Reviews, and Approvals

Action Requiring Permit, Approval, or Review	Permit/Approval or Review	Accepting Authority/ Approving Agency	Statutory Reference
Federal			
Temporary Land Use Permit; Form 2920	Temporary Use Permit (pre-operational activities on BLM land)	BLM	43 USC 1201; 43 CFR Part 2920
Rights-of-way Over Land Under Federal Management; Form SF-299	Right-of-way Grant	BLM	FLPMA (PL 94-579) USC. 1761-1771 and 43 CFR 2800
NEPA Compliance to Process Right-of-way Application	EIS and ROD	BLM	NEPA, 40 CFR 1500 et. seq.
NHPA Compliance to Process Rights-of-way Application	Section 106 Compliance or Consultation	BLM/Nevada State Historic Preservation Office (SHPO)	NHPA, 36 CFR part 800; 16 USC 47; NRS Chapter 384
Compliance with the ESA	Review by BLM to initiate Section 7 consultation	BLM/U.S. Fish and Wildlife Service (USFWS)	ESA Section 7 Consultation, 50 CFR Part 17, 16 USC 1536
Dredge or Fill Activities in Waters of the United States; Dry Wash Crossings	Jurisdictional Delineation Report Concurrence, Nationwide or Individual Permit	U.S. Army Corps of Engineers (USACE)	33 USC 1344
Project Component Height Relative to Air Traffic	No Hazard Declaration required if any structure is more than 200 feet	Federal Aviation Administration	49 USC 1501, 14 CFR Part 77
U.S. Environmental Protection Agency (EPA) ID Number	Compliance with federal hazardous waste management requirements	EPA	40 CFR Part 124, 260, and 270
Oil Pollution Prevention – Spill Prevention, Control, and Countermeasure (SPCC) Plan	If total aboveground storage capacity of oil is greater than 1,320 gallons, then a SPCC Plan is required.	EPA – Office of Emergency Services	40 CFR Part 112, and Section 311(j) of the CWA
Review of Project for its potential impact on military over flights and operations	U.S. Department of Defense (DOD) R 2508 Complex Sustainability Office	U.S DOD	U.S. DOD
State of Nevada			
Permit to Construct a Public Utility in Nevada	Utility Environment Protection Act – Permit to Construct	Nevada Public Utility Commission	NRS 704.820 – 704.900, NAC 703.415 – 703.427

Table 1-3 Authorizations, Permits, Reviews, and Approvals

Action Requiring Permit, Approval, or Review	Permit/Approval or Review	Accepting Authority/ Approving Agency	Statutory Reference
Discharge of Stormwater to Waters of the State	Construction Stormwater General Permit (NVR 100000)	Nevada Division of Environmental Protection (NDEP) – Bureau of Water Pollution Control (BWPC)	40 CFR122.26(b)(14), NRS 445A.465
Section 401 Certification	Required if Section 404 permit is needed – State certification that federal permit does not violate water quality standards	NDEP – Bureau of Water Quality Planning (BWQP)	Section 401 of CWA
Separate Stormwater Permit for operations	General Stormwater Permit for Industrial Activities	NDEP – BWPC	NRS 445A.465
Temporary permit needed for groundwater discharge associated with construction	Groundwater Discharge Permit	NDEP – BWPC	NRS 445A.465
Operating Permit Class I, II, or III (depending on Calculated Potential to Emit)	Air Quality Operating Permit	NDEP – Bureau of Air Pollution Control (BAPC)	NRS 445B.100 through 445B.640, NAC 445B.001 through 445B.3689 (operating permits outside Clark County)
Construction activities disturbing more than 5 acres	Stand-alone Surface Disturbance Permit	NDEP – BAPC	NAC 445B
Permit to Store, Use of Manufacture Hazardous Materials at a Facility	Hazardous Materials Permit	State Fire Marshal	NAC 477.323, NAC 477.325
Permit to Appropriate Water; Change of Use	Permit to Appropriate the Public Water of the State of Nevada	Nevada Division of Water Resources (NDWR)	NRS 533 and 534
Public Water System Permit	Non-community Water System	NDEP – Bureau of Safe Drinking Water	NRS 445, NAC 445A.450 through 445A.6731
Use of a Highly Hazardous Substance	Chemical Accident Prevention Program/ Authority to Construct and Permit to Operate	NDEP	NRS 459.380
Management of Hazardous Waste	Hazardous Waste Management Permit	NDEP – Bureau of Waste Management	NRS 459.400 through 459.600
Transporting of Hazardous	Hazardous Materials	Nevada Department of	NRS 459.400 through

Table 1-3 Authorizations, Permits, Reviews, and Approvals

Action Requiring Permit, Approval, or Review	Permit/Approval or Review	Accepting Authority/ Approving Agency	Statutory Reference
Materials	Transportation Permit	Transportation (NDOT)	459.600
Solid Waste Class II Wavered Landfill Authorization	Approval to Operate a Solid Waste System	NDEP – Bureau of Waste Management	NRS 444.440 through 444.645
General Permit to Operate Septic System	On-site Sewage Disposal System	NDEP BWPC	NRS 445A, NAC 445A
Construction of Evaporation Ponds	Industrial Artificial Pond Permit	Nevada Department of Wildlife (NDOW)	NRS 502.390, NAC 502.460 through 502.495
Disturbance of any Native Plant Species and/or Native Plant Habitat Regarded as Threatened with Extinction	Conditional Permit for Disturbance or Destruction of Critically Endangered Plants	Nevada Division of Forestry	NAC 527.260 through 527.300
Disturbance of Wildlife and/or Wildlife Habitat (Not specific to endangered species)	Written Approval Prior to Handling Any Wildlife as Defined by the State of Nevada	Nevada Division of Wildlife	NRS 445, 501.181, and NRS 503.597; NAC 503.093 and 504.520
Encroachment or Construction Activities within Highway Right-of-way	Right-of-way Occupancy Permit	NDOT	NAC 408
Pressure vessel specification and certifications	Boiler & Pressure Vessel Certificate	Nevada Industrial Relations Division	NRS 455C.100
Required for extraordinarily large or oversized equipment traveling on state roads or unusual impacts to traffic are anticipated	NDOT Super Load Permit	NDOT	NRS 484.471
Nye County			
Building and operation fire safety	Fire Safety Compliance Certification	Nye County Bureau of Fire Prevention	Nye County Code
Certification of flood zone location	Flood Damage Prevention Permit	Nye County Planning Department	Nye County Code
Type, location, duration of encroachment onto public roadway	Encroachment Permit	Nye County Department of Public Works	Nye County Code
Building Permit (for structures)	Building Permit	County Building Division	Nye County Code

1.7 AGENCY COORDINATION

1.7.1 Cooperating Agencies

Cooperating agency status provides a formal framework for governmental agencies to engage in active collaboration with a federal agency to implement the requirements of the NEPA (42 USC §4321 et seq.). Federal and state agencies and local and tribal governments may qualify as cooperating agencies because of "jurisdiction by law or special expertise" (40 CFR §§1501.6-1508.5).

The BLM invited nine agencies to consider becoming a cooperating agency. Agencies invited to participate include:

1. USFWS
2. U.S. DOD, Regional Environmental Coordination Office
3. DOE, National Nuclear Security Administration
4. Federal Highway Administration
5. National Park Service (NPS), Death Valley National Park
6. USACE, Sacramento District
7. NDOW
8. NDOT
9. Nye County

The U.S. DOD, DOE, NPS, USACE, NDOW, and Nye County have formally requested to be cooperating agencies for the Proposed Action. Each of these agencies has agreed to participate as a cooperating agency and review material for the EIS pertaining to their legal and regulatory responsibilities. The Federal Highway Administration, USFWS, and NDOT declined the invitation.

1.7.2 Native American Consultation

The BLM conducts consultation and coordination with American Indian tribal governments for proposed projects that may affect their ancestral lands. On June 17, 2009, the BLM sent formal consultation letters to representatives of the Timbisha Shoshone Tribe, the Pahrump Paiute Tribe, the Las Vegas Paiute Tribe, the Chemehuevi Indian Tribe, and the Colorado River Indian Tribes describing six proposed solar energy projects in the Amargosa and Pahrump Valleys, Nye County, including the proposed Project. On August 5, 2009, the same tribes were e-mailed information about the Project's scoping meetings if they wished to attend and make comments. A field visit was conducted with the Timbisha Shoshone in the Project area to review the archaeological resources identified during the cultural resource inventory on September 17, 2009. At this time, no religious or cultural concerns have been brought forth to the BLM concerning this proposed Project or Project area by any of the Tribes contacted.

1.7.3 Section 7 Consultation

A species list was requested from the USFWS, which identified flora and fauna listed as threatened, endangered, or candidate under the ESA and that occur or have the potential to occur within the Project area and its vicinity. At the request of the USFWS, rare plant and Desert Tortoise surveys were conducted within the Project area. A Biological Assessment (BA) has been prepared for the Proposed Action and was submitted in May 2010 to the USFWS as required by Section 7 of the ESA. Consultation with the USFWS was triggered once the BA was submitted. Consultation with the USFWS is ongoing. However, a Biological Opinion will be issued prior to the ROD for this Project.

1.8 PUBLIC INVOLVEMENT

Chapter 5, Consultation and Coordination, contains an in-depth discussion of the public involvement process and the issues raised by the public and other agencies during that process.

1.9 CHANGES BETWEEN THE DRAFT AND FINAL EIS

In response to public comments on the Draft EIS, the BLM has made a number of changes to the Final EIS. The most substantive changes are listed below, and, as many comments requested, they provide greater certainty regarding the proposed Project's features and potential impacts. Editorial and grammatical changes to improve accuracy, clarity, consistency, and improved readability also have been made to the Final EIS based on public comment and internal review. Please refer to Appendix G for a compilation of all public comments received during the comment period and how they have been specifically addressed in the Final EIS.

Selection of Project Well – The Draft EIS evaluated the use of three separate wells for Project use. However, following issuance of the Draft EIS, the Proponent determined that only one of the wells considered would be needed for construction and operation (see Section 2.3.6). The well, with associated certificated water right 5717, has an annual duty of 603 acre-feet. On March 18, 2010, the Proponent filed an application (No. 79699) with the Nevada State Engineer's Office to change the place and manner of use of the water right. The Proponent has requested that 400 acre-feet of the 603 acre-feet annual duty be changed from agricultural to industrial use. Following approval of a second application (No. 79783) by the Nevada State Engineer, the Proponent intends to drill a new well approximately 300 feet west of the existing well and move 400 acre-feet from its current point of diversion to the new well. The remaining 203 acre-feet will remain with the existing well. This will allow for redundancy should one of the wells fail. During construction, the Proponent will lease the full annual duty (603 acre-feet per year [afy]) from the water rights holder for the Project well. During this period, the water rights holder will fallow farmlands that were previously irrigated. After construction, the water rights holder may continue to irrigate up to 40 acres of farmland with the 203 acre-feet assigned to the existing well.

Addition of Evaporation Pond(s) to Manage Industrial Wastewater Flow – Through refinement of the Project design and subsequent to the issuance of the Draft EIS, the Proponent has informed the BLM that the Proposed Action would require the construction and operation of

four 4-acre (16 acres total) evaporation ponds for boiler blowdown. These evaporation ponds would be placed within the existing Project footprint and would disturb no additional land surface areas beyond what was previously analyzed. While the residue in the evaporation ponds represents an additional waste stream that would require off-site disposal, the volume and frequency of such disposal would not be substantially different than previously analyzed. Evaporation ponds are a primary concern for biological resources, particularly impacts resulting from the attraction of migratory and resident avian species, which could lead to inadvertent poisoning due to concentrated salt and other minerals or accidental drowning. Evaporation ponds also have the potential to impact water quality. The Proponent will coordinate the construction and operation of the evaporation ponds in consultation with NDEP to ensure the project is designed and operated to meet all federal, state, and local laws and regulations. At a minimum, the evaporation ponds would be double-lined and covered with narrow-mesh netting to prevent access by ravens and migratory birds in accordance with applicable regulations. Air quality impacts of construction and operation of the evaporation ponds would not be substantially different than previously analyzed.

Project-specific Air Quality Modeling – Emission tables in the Final EIS have been revised to reflect project-specific impacts. In the Draft EIS, the air quality modeling was for a facility in California that utilized similar technology in a similar climate. Because Nevada and California have different regulations for air quality monitoring and reporting, there is some inconsistency between what was reported in the Draft EIS and what is now reported in the Final EIS. Air quality modeling has now been completed for the proposed Project. The emission tables provided in Chapter 4.1 of the Final EIS reflect the results of modeling that was done for the proposed Project, which will be regulated by NDEP – BAPC.

Water Resources Mitigation Measures – Following issuance of the Draft EIS and as part of the Section 7 ESA consultation between the BLM and USFWS, minimization measures specifically designed to reduce impacts to sensitive species occurring at the Ash Meadows NWR and Devils Hole were developed and agreed to by the Proponent, BLM, USFWS, NPS, and Nye County (see Section 2.3.6 and Appendix A). To address the NPS, USFWS, and BLM concerns that the proposed groundwater withdrawals associated with the proposed Project—in combination with existing groundwater withdrawals in the vicinity of Devils Hole and the Ash Meadows NWR - may adversely affect federal rights and resources, the Proponent has agreed to acquire no less than 236 afy of preferably senior groundwater rights in the vicinity of the water right to be used for the proposed Project, or closer to Devils Hole and Ash Meadows NWR. The 236 afy consists of 204 afy identified as "Minimization Water Rights" (see Appendix A), and an additional 32 afy to offset the potential reduction in groundwater return flow as a result of changing the manner of use from agricultural to industrial. Preference will be given to rights that are currently used for agricultural purposes. The acquired rights will preferably be historically fully utilized. If fully utilized rights totaling 236 afy are unavailable for purchase, sufficient rights will be purchased such that the cumulative total of the historic pumping average is no less than 236 afy. This may result in the purchase of more than 236 afy of water rights. At this time, it is unknown where the additional water rights will be obtained.

1.10 ORGANIZATION OF THE FINAL EIS

This EIS follows the CEQ recommended organization per 40 CFR 1502.10, and BLM guidelines as described in the BLM Handbook, H-1790-1. Table 1-4 describes the organization of the Final EIS.

Table 1-4 Organization of the Final EIS

Chapter 1 – Introduction, Purpose and Need	This chapter provides a description of the purpose of, and need for, the Proposed Action, the role of the BLM in the EIS process, and the required regulatory actions for the proposed Project. The Final EIS includes a summary of changes between the Draft and Final EIS.
Chapter 2 – Proposed Action and Alternatives	This chapter describes the Proposed Action and alternatives analyzed in the EIS, including the No Action Alternative. Alternatives that were considered but eliminated from further analysis are described, with a discussion of why they were not considered further.
Chapter 3 – Affected Environment	This chapter describes the existing environment that could be affected by granting the rights-of-way requested by the Proponent. The existing environment includes the social and natural environment.
Chapter 4 – Environmental Effects	This chapter describes possible environmental consequences of the Proposed Action and alternatives analyzed in the EIS. Direct, indirect, and cumulative effects of the Proposed Action and alternatives are assessed and described in order to allow for comparative impact evaluation. Impacts are compared to the social and natural environment that would be expected to exist if no action were taken (the No Action Alternative).
Chapter 5 – Consultation and Coordination	This chapter describes public participation undertaken to date, and additional opportunities that would occur throughout the EIS process. It also lists agencies and organizations that will receive copies of the Draft EIS for review and lists the preparers of the document.
Chapter 6 – References	This chapter includes a list of references used in the preparation of the Final EIS.
Chapter 7 – Glossary	This chapter includes a glossary of technical terms used.
Chapter 8 – Index	Index listing of keywords used in the Final EIS.

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CHAPTER 2 - PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

This chapter presents a description of the alternatives analyzed in this EIS. The Proposed Action alternative includes the features of the proposed Project including the two, dry-cooled, 250 MW solar plants with thermal storage and their associated facilities. A second alternative considers the construction and operation of two wet-cooled 250 MW solar plants with thermal storage and their associated facilities. Under the No Action Alternative, there would not be a solar facility constructed and the environmental and social setting would be unchanged from with current conditions. Other alternatives were considered but eliminated from detailed study as explained in this section.

2.1.1 Regulatory Framework for Alternatives

The BLM is required by NEPA to evaluate not only the Proposed Action, but reasonable alternatives including the No Action Alternative (40 CFR §1502.14). Section 1502.14(a) requires Federal agencies to explore a reasonable range of alternatives, "and for alternatives that were eliminated from detailed study, briefly discuss the reasons for their having been eliminated." The CEQ Guidance concerning the NEPA regulations adds that reasonable alternatives include those that are "practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant" (CEQ NEPA's 40 Most Asked Questions, Answer to Question #2).

When granting a right-of-way, FLPMA Title V requires BLM to include in the right-of-way terms and conditions that minimize environmental impacts. Specifically, such terms shall "minimize damage to scenic and esthetic values and fish and wildlife habitat and otherwise protect the environment ... require compliance with applicable air and water quality standards established by or pursuant to applicable federal or state law; and ... require compliance with State standards for public health and safety, environmental protection, and siting, construction, operation and maintenance of" the right-of-way. Consideration of such terms and conditions will be part of the alternatives analyzed in this Final EIS.

2.2 ALTERNATIVES DESCRIPTION

Based on issues, concerns, and opportunities raised during public scoping, interdisciplinary interaction among resource professionals, and collaboration with interested agencies, a range of potential alternatives to be considered in the EIS were identified and evaluated by the BLM. Based on meetings and discussion with resource professionals and Project staff, three alternatives were chosen to be evaluated in detail in the EIS.

Alternatives to be evaluated in detail in this EIS include: (1) the Proposed Action as described in the Proponent's POD, using the dry-cooled option; (2) the Proposed Action as described in the Proponent's POD, using the wet-cooled option; and (3) the No Action Alternative.

The following section describes the alternatives considered and eliminated from further consideration, followed by a discussion of the Proposed Action (dry-cooled alternative), the Wet-Cooled Alternative, and the No Action Alternative.

2.2.1 Alternatives Eliminated from Further Analysis

In accordance with 40 CFR §1502.14, and consistent with guidance in BLM's NEPA Handbook, alternatives were not carried forward for further analysis if the alternative:

- would be ineffective (it would not respond to the BLM's purpose and need)
- would be technically or economically infeasible
- is inconsistent with the basic policy objectives of the Las Vegas RMP/EIS
- would involve remote or speculative implementation
- is substantially similar in design to an alternative that is analyzed
- would have substantially similar effects to an alternative that is analyzed

2.2.1.1 Alternative Sites

As part of its siting process, the Proponent used a refined set of criteria to screen, identify, and prioritize potential land sites for eventual solar development. Criteria include the physical characteristics of the site, environmental considerations, and economic factors. Each of these criteria was applied during the screening phase for the proposed Project, which led to the selection of the current site.

These criteria included:

- **Solar Resource** – The site needs to be located where high solar insolation is available to maximize the plant's output and allow efficient utilization of the land area affected by project development. For a project to be economically viable, solar insolation levels of greater than 7 kilowatt-hours per square meter per day are desirable.
- **Size and Shape** – The site must be large enough (at least 4,000 contiguous acres) and of adequate proportions to include two 250 MW parabolic trough solar thermal plants. The shape of the site should also support an efficient and cost-effective layout of the project facilities.
- **Slope** – The site should be relatively flat, with a slope of 2 percent or less, to minimize the need for extensive grading and a large volume of cut and fill.

- **Environmental sensitivity** – The site should not be highly pristine or biologically sensitive (e.g., not within a designated wilderness area or Area of Critical Environmental Concern [ACEC]).

- **Availability of Infrastructure and Water** – To minimize cost and potential environmental impacts, the site should be located where water resources are available, and interconnection to an existing transmission system is possible without the construction of lengthy transmission lines. In addition, the site should be in reasonable proximity to suitable transportation infrastructure to allow easier access during both construction and operation without creating the need for additional road construction.

- **Site Control** – The land must be available for sale or lease/right-of-way, at a reasonable cost and be free of conflicting encumbrances. Land with many different owners does not provide adequate site control.

- **Labor Availability** – The site should be close enough to areas with large construction labor pools so as to maximize the number of construction workers within daily commuting range.

- **Economic Viability** – The Project must be economically viable and competitive with other renewable technology projects, including wind, geothermal, and other solar projects. To be viable, the site should be located on property currently available at a reasonable cost, be as close as possible to transmission and transportation infrastructure, and have a high solar resource value.

The selected Project site is located in an area with an excellent solar resource and is large enough to accommodate two 250 MW plants in an optimal layout. In addition, the Project site is relatively flat; not located in any wildlife management or conservation areas; has access to transmission infrastructure and water resources; and was available for an application for a right-of-way from the BLM. Finally, the Project site allows for access to skilled labor and other industrial infrastructure from nearby Pahrump and Las Vegas. Based on these criteria, the present Project site was selected.

Three alternative sites in the regional area were considered. The three sites include a site southeast of Pahrump (Sandy Hills), a site a few miles south of the proposed Project along Anvil Road in Amargosa Valley (Anvil Road), and a site near the Beatty Airport (Beatty Airport). Right-of-way applications were filed for each of these sites in 2007 and 2008. The right-of-way applications for each of these sites were ultimately withdrawn after the Proponent conducted due diligence and preliminary studies on each site and determined the alternative sites did not meet the above criteria. Table 2-1 summarizes the weaknesses and strengths of each of the alternative sites.

Table 2-1 Alternative Sites Considered

Alternative Site	Solar Resources	Size and Shape	Slope	Environmental Sensitivity	Availability of Infrastructure	Site Control
Sandy Hills Site	Yes	Yes	No	No	Yes	No
Anvil Road Site	Yes	No	Yes	Yes	Yes	No
Beatty Airport Site	Yes	No	Yes	Yes	No	Yes
Yes – Site met criteria; No – Site did not meet criteria						

The Sandy Hills site consisted of approximately 8,000 acres in Pahrump Valley approximately 20 miles southeast of Pahrump. Although the site was large enough to accommodate two 250-MW solar power plants, the site was eliminated from further consideration due to the slope of the site, as well as the existence of sensitive vegetation and wildlife, conflicting encumbrances, and water availability. Construction and operation of a solar thermal power plant at this site would result in higher environmental impacts than the Proposed Action, while not offering any offsetting advantages.

The Anvil Road site consisted of approximately 1,000 acres, located a few miles south of the selected Project site. The site was flat and had good access to transmission and water infrastructure but was too small to accommodate one 250 MW plant, let alone two of them. The Proponent explored acquiring additional private land surrounding the site but determined that the acquisition of sufficient lands was not economically viable. Due to the number of parcels that would have to be acquired to accommodate two 250-MW solar power plants would make obtaining site control more challenging (in comparison to obtaining a right-of-way grant to use BLM lands). This, combined with the size and existing encumbrances on the site, made the site not viable.

The Beatty Airport site consisted of approximately 2,500 acres located adjacent to the Beatty Airport (approximately 35 miles north of the Project site). It was flat and had good solar resource, but it was too small for two 250 MW plants, and had existing encumbrances. The Proponent also determined that access to transmission and water would be more difficult and costly than the Project site that was ultimately selected.

During the 45-day public comment period, the BLM received several comments requesting the agency conduct a full analysis of other sites considered by the Proponent. As described above, the Proponent evaluated several sites before selecting the proposed Project site. The BLM concurred with the Proponent's conclusions to dismiss the alternative sites from further consideration.

The Proponent also considered the alternative of developing the proposed Project as a single 250-MW plant. Generally, building one plant would have fewer environmental impacts, when that plant is considered in isolation. However, given the infrastructure requirements associated

with building a single 250 MW plant, building two plants allows for economies of scale and reduces the infrastructure impacts, including transmission access and water development. In addition, a single plant would be substantially less effective in meeting the Project objective of supporting attainment of renewable energy mandates and objectives, and attaining the Project objective of supporting those mandates and goals. For these reasons, the development of a smaller project was rejected.

During the scoping and 45-day public comment periods, several comments were received requesting that the Proponent move the Project site further north; at least 0.5 to 2 miles away from existing residential or public buildings. The BLM land immediately north of the Project area has a pending right-of-way application on file with the BLM Pahrump Field Office (Cogentrix - NVN-083150). The Proponent filed an overlapping or "second-in-line" right-of-way application on these lands (NVN-087366); however, subsequent discussions between Cogentrix and BLM staff indicate Cogentrix intends to seek approval to develop a solar energy project at this location within the next 2 to 3 years. Although the BLM's right-of-way regulations provide that conflicting applications may be resolved through a competitive process (see 43 CFR §§ 2804.23(c), 2806.50, it is unlikely that the Proponent's overlapping application could be processed in a timeframe that met the Proponent's objectives.

2.2.1.2 Alternative Solar Technology

The Proponent has requested a right-of-way to construct and operate a dry-cooled solar thermal parabolic trough project. The dry-cooled alternative is the Proponent's preferred alternative primarily because it is a well proven technology for this scale of power generation. Solar thermal parabolic trough technology has a history of successful operation in the United States, removing much of the construction and operational risk from construction and operation of the proposed Project. In addition, the Proponent has significant experience and expertise in developing and constructing parabolic trough plants. The Proponent is a wholly owned subsidiary of Solar Trust of America, LLC, a joint venture between Solar Millennium AG and Ferrostaal AG. Solar Millennium AG is an international developer and supplier of parabolic trough collector technology used in powering solar thermal power plants. Solar Millennium AG developed and designed the first parabolic trough power plants, Andasol 1-3, in Spain. Ferrostaal AG is a worldwide provider of industrial services and plant construction and engineering.

Construction and operation of a solar thermal parabolic trough plant using wet-cooling is an alternative that is considered in this Final EIS. Wet-cooling technology has performance advantages in comparison to dry-cooling. Performance is enhanced because wet-cooling relies primarily on evaporation to remove heat from the circulating water, while dry-cooling technology uses an air cooled condenser that cools the steam turbine-generator exhaust steam using a large array of fans that force air over finned tube heat exchangers. The disadvantages of dry-cooling are higher capital costs, higher auxiliary operating power requirements and an overall lower plant performance, especially on hot days, when the peak power is needed most. A dry-cooled plant produces about 5 percent less electric energy on an annual basis than a wet-cooled plant, because of this reduced performance on hot summer days. The cost of electricity produced by a dry-cooled plant is approximately 6 to 9 percent higher than the cost of electricity

produced by a wet-cooled plant. Thus dry-cooling of a trough plant minimizes water use, but at a 6 to 9 percent cost penalty.

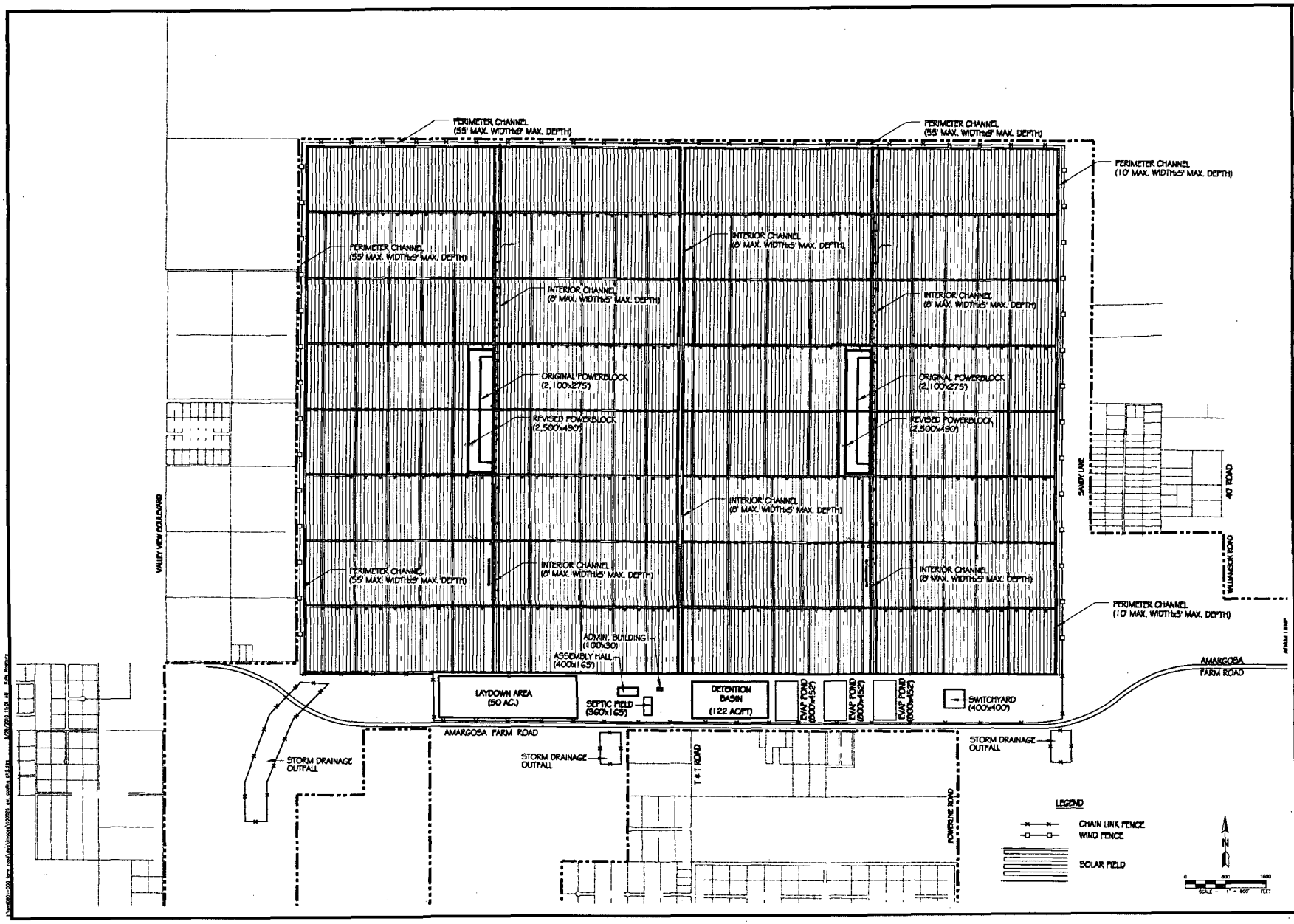
2.3 PROPOSED ACTION ALTERNATIVE – DRY-COOLED ALTERNATIVE

The Proposed Action alternative includes the construction and operation of a two-unit parabolic trough solar power plant, with each unit having a net output of 250 MW. The plant will consist of two conventional steam Rankine-cycle power blocks, a parabolic trough solar field, a HTF and steam generation system, a nitrate salt thermal energy storage system, and a variety of ancillary facilities (sometimes referred to collectively as "balance-of-plant"), such as conventional water treatment, electrical switchgear, administration, warehouse, and maintenance facilities. The electric output of the plant will be provided entirely by solar energy. No electricity will be generated by the use of fossil fuels.

Project facilities would be located on approximately 4,350 acres and would include the solar fields, power blocks (located in the center of each solar field), an office and maintenance building, parking area, lay-down area, stormwater detention basin, evaporation ponds, and switchyard. The assembly hall, administration building, laydown area, septic field, detention basin(s), and switchyard will be located north of the realigned portion of Amargosa Farm Road. Amargosa Farm Road is an existing public roadway maintained by Nye County Public Works. The roadway consists of 24 feet of asphalt/concrete pavement and roadside ditches on both sides. Amargosa Farm Road will be realigned, approximately 1,320 feet (0.25 mile) south of the existing roadway and would extend from the vicinity of Sandy Lane to Valley View Boulevard; a distance of approximately 3.5 miles. The proposed roadway alignment would be coordinated with Nye County Public Works and be reconstructed in conformance with current standards and stipulations outlined in the Development Agreement between Nye County and the Proponent.

Preliminary Project site plans depicting the alignment alternatives for both the dry-and wet-cooled alternatives are provided in Figure 2-1 (wet-cooled layout) and Figure 2-2 (dry-cooled project layout). The final plant layout will be determined based on engineering design and in consideration of resource constraints and opportunities. General facility dimensions are listed in Table 2-2.

A land survey of the proposed right-of-way is being performed to determine the final boundary and extent of the Project area. A topographic survey was performed to obtain one-foot contours for final engineering design for grading and drainage-related requirements. A preliminary geotechnical study of the Project site will be conducted to evaluate general subsurface conditions, seismicity, and other geological hazards and to provide recommendations for design and construction of the foundations for Project structures.



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SOLAR MILENNIUM, LLC.

AMARGOSA FARM ROAD SOLAR PROJECT
FIGURE 2-1 WET COOLED ALTERNATIVE

DATE: 08-26-10
DRAFTER: NL
DESIGNER: NL
CHECKED: BDP
PROJECT NO. SML0801.000

FIG. 2-1
SHEET 1 OF 1

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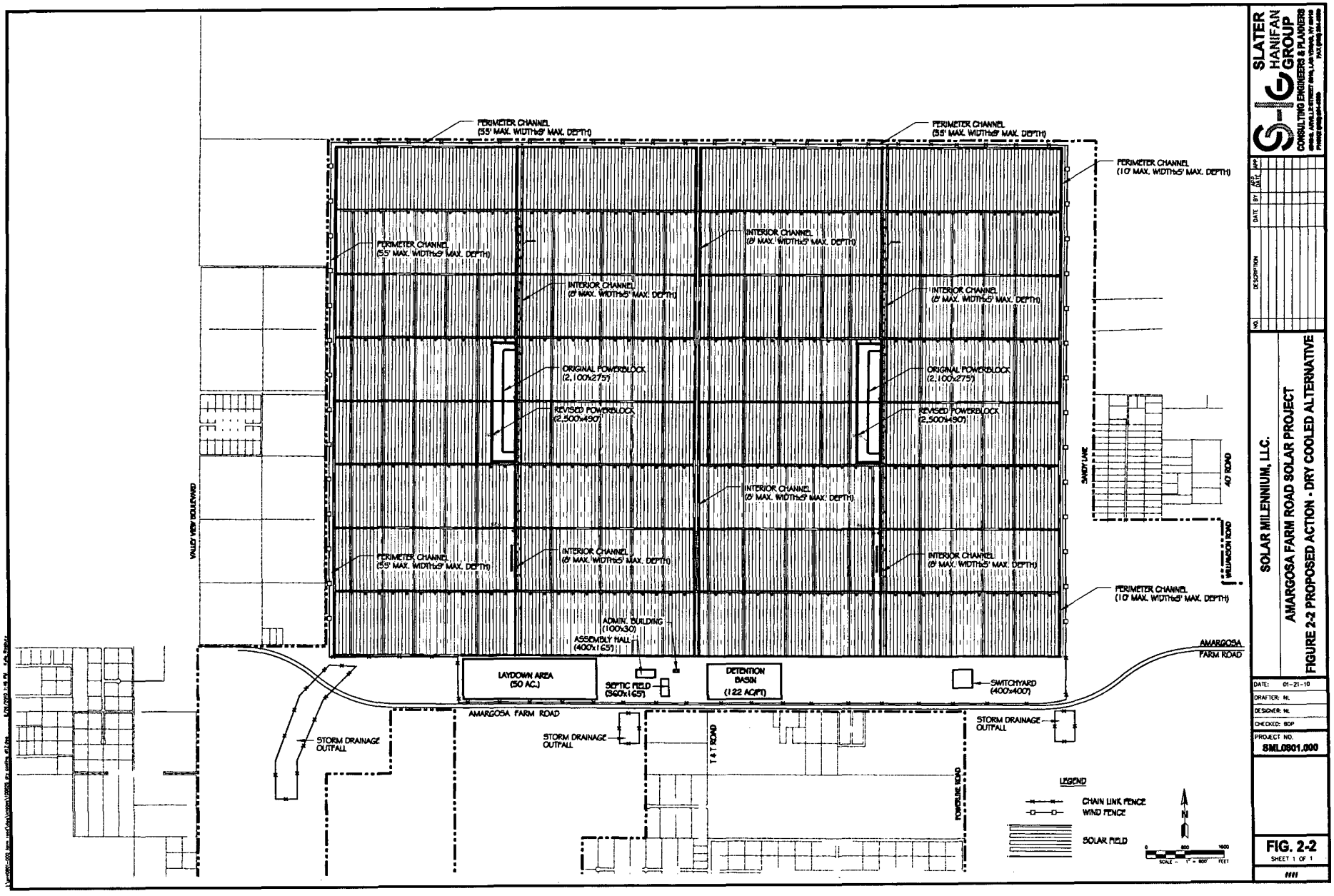

SLATER HANIFAN GROUP
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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

SOLAR MILLENNIUM, LLC.

AMARGOSA FARM ROAD SOLAR PROJECT

FIGURE 2-2 PROPOSED ACTION - DRY COOLED ALTERNATIVE

DATE: 01-21-10
DRAFTER: NL
DESIGNER: NL
CHECKED: BOP
PROJECT NO. SML0801.000

FIG. 2-2
SHEET 1 OF 1

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Table 2-2 Preliminary Facility Dimensions

Project Component	Approximate Dimensions / Acreage	Proposed Alternative (Dry-Cooled)	Wet-Cooled Alternative
Solar Fields	Two fields, Approximately 7,800 feet east-west by 11,000 feet north-south. Each field has a collector aperture area of approximately 2 million square meters. (1,970 acres)	X	X
Power Blocks[1]	Dry-cooled – One power block located in the center of each solar field (28 acres each). Dimensions of each power block is 2,500 feet x 490 feet; tallest major structure is the air-cooled condenser at 144 feet high Wet-cooled – One power block located in the center of each solar filed (28 acres each). Dimensions of each power block is 2,500 feet x 490 feet; tallest major structure is the water-cooled condenser at 55 feet high	X	X
Switchyard	400 feet x 400 feet (3.7 acres)	X	X
Assembly Hall/Maintenance Building	394 feet x 164 feet x 46 feet (1.5 acres)	X	X
Main Office Building	200 feet x 53 feet x 12 feet (.24 acres)	X	X
Parking Area	250 feet x 100 feet (0.5 acres)	X	X
Stormwater Detention Basin	1,200 feet x 1,200 feet (33 acres) – providing 122-acre-feet of storage assuming 4-foot-deep basin)	X	X
Evaporation Pond(s)	Dry-cooled – Two 4-acre evaporation ponds per power block (16 acres total for the project) Wet-cooled - Three 8.3-acre evaporation ponds (25 acres total for the project)	X	X
Bioremediation Area	400 feet x 800 feet (7.3 acres total for the project)	X	X
Fencing	Wind fencing on east and west side of facility: 30 feet high x approximately 11,000 feet long per side Perimeter fencing on north side of facility: 9 feet high x approximately 15,500 feet long Perimeter fencing on south side of facility: 8 feet high x approximately 17,500 feet long	X	X

[1] Components contained within the power block area are shown on Figure 2-4.

All plant facilities will be designed, constructed, and operated in accordance with applicable laws, ordinances, regulations, and standards. All generating facilities will be located within the facility fence line. Project-related linear facilities located outside the plant site fence line include the access road off of Valley View Boulevard, and the water pipeline to convey water to the Project site.

2.3.1 General Process Description

The solar power plant cycle basically consists of three distinct, coupled systems: the solar field and HTF system, the thermal energy storage system, and the power block. At the basic level, the HTF moves accumulated solar heat from the parabolic trough solar field to drive the turbine generator. The system distributes cold HTF from the power block to solar field collector loops, and collects hot HTF from the solar field, and inputs the collected heat to the feedwater/steam cycle. A schematic depicting this process is shown on Figure 2-3.

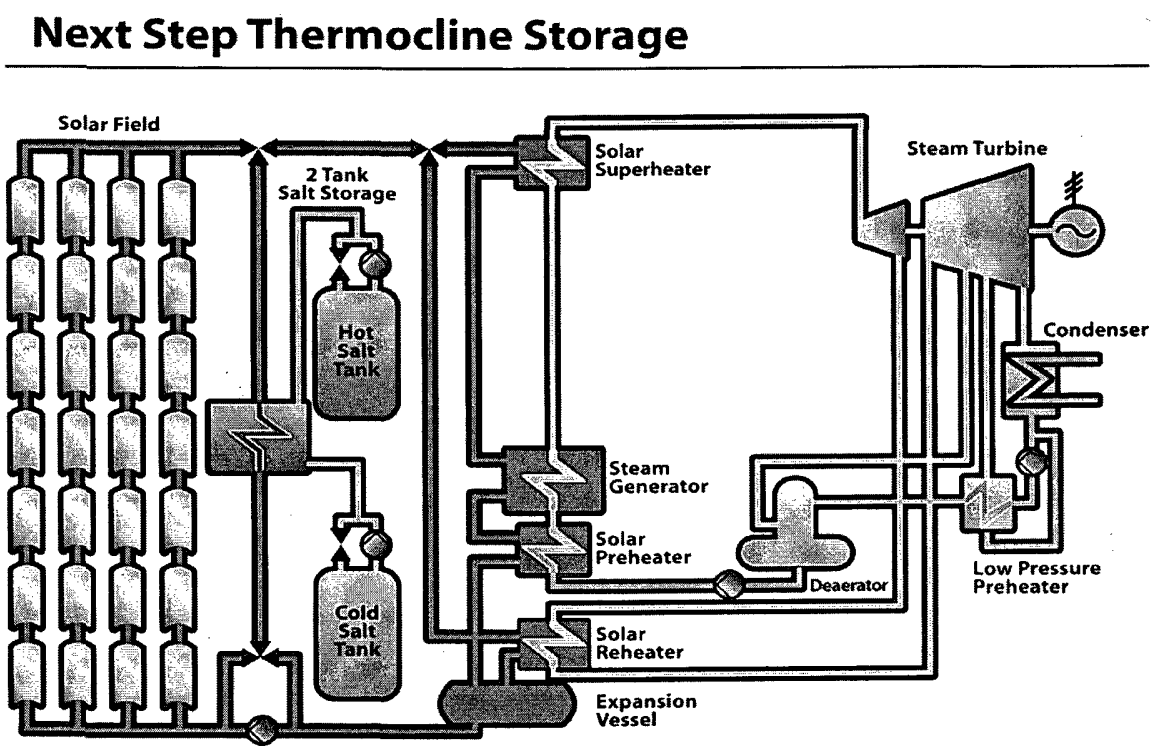


Figure 2-3 Plant Schematic Diagram (with thermal storage)

The HTF cycle is driven by two parallel pump stations. The nominal flow rate is approximately 2,800 kilograms per second (6,200 pounds per second). During operation, the HTF temperature varies from 739 °F (393 °C) [hot] after heating by the solar field to 565 °F (296 °C) [cold] leaving the power block heat exchangers. The hot HTF flows to parallel steam generation trains. Each train includes a preheater, steam generator, superheater and reheater. In normal operation, the hot HTF stream is split between the trains. It is also possible to remove each train from the loop via motor control valves.

As the solar field begins tracking the sun and the HTF heats up, its thermal expansion is accommodated in an expansion vessel. If the HTF in this vessel reaches its design working level it flows into overflow vessels. If thermal input to the HTF stops, the HTF begins to contract. The HTF level in the expansion vessel falls, and the overflow return pumps transfer the HTF from the overflow vessels back into the expansion vessel to maintain sufficient content at that location.

2.3.2 Solar Fields

Approximately 90 percent of the plant footprint is taken by the two parabolic trough solar fields. The solar fields will be modular, distributed systems of 4 solar collector assemblies (SCA), or *loops,* connected in a series-parallel arrangement via a system of insulated pipes. A loop is approximately 72 feet wide and 2,790 feet long, and is designed to raise the temperature of the heat collection fluid by approximately 175 °F (79.4 °C). The collectors will be equipped with a sun tracking mechanism that moves the reflecting panels toward the sun to the optimum angle for solar energy collection.

2.3.2.1 Solar Collector Assemblies

The SCAs are oriented north and south and rotate east to west to track the sun as it moves across the sky throughout the day. The SCAs collect heat by means of linear troughs of parabolic reflectors that focus sunlight onto a straight line of heat collection elements (HCE) welded along the focus of the parabolic trough. Each SCA includes local measurement instrumentation, a hydraulic drive system, and a controller that independently tracks the sun to maintain mirror focus on the HCEs and protects the HCEs from overheating.

Each SCA will be supported by structures (stands) that connect the parabolic troughs to the drive mechanism. Each array will be supported by multiple individual foundations with a foundation located approximately every 63 feet, along the assembly. Foundation design will be based on site-specific geotechnical conditions to ensure that the SCA stands are able to support all loading conditions (including wind loading) at the Project site.

2.3.2.2 Parabolic Trough Collector Loop

Each of the collector loops consist of two adjacent rows of SCAs, each row about 1,200 feet long. The two rows are connected by a crossover pipe. The HTF is heated to a high temperature as it circulates through the receiver tube and returns to a series of heat exchangers in the power block where the fluid is used to generate high-pressure superheated steam. The superheated steam is then fed to a conventional power block, consisting of a reheat steam turbine generator to produce electricity, and carried to a nearby substation via a project-specific transmission line. In normal operation, HTF enters the field at 565 °F (296 °C) and leaves the field at 739 °F (393 °C).

The HTF is a synthetic hydrocarbon liquid mixture of diphenyl ether and biphenyl oxide. Similar formulations are marketed by different manufacturers under the names of Therminol or Dowtherm. The HTF is not classified as a hazardous material by the U.S. Department of

Transportation (USDOT), and is not listed under EPA Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulations. It has a crystallizing (freezing) point of about 54 °F (12 °C). Freeze protection is routinely accomplished by circulating HTF at a very low flow rate through the solar field using hot HTF from the vessel as a source.

2.3.2.3 Parabolic Mirrors

The parabolic mirrors to be used in the solar fields are low-iron glass mirrors, and are known to be one of the most reliable components in the SCAs. No long-term degradation of the mirrors has been observed at other solar thermal plants, and older mirrors can be brought back to nearly full reflectivity with simple cleaning. The typical life spans of the reflective mirrors is 30 or more years. The HCEs of the solar plant are comprised of a steel tube surrounded by an evacuated glass tube insulator. The steel tube has a coated surface that enhances its heat transfer properties with a high absorptivity for direct solar radiation, accompanied by low emissivity. Glass to metal seals and metal bellows are incorporated into the HCE to ensure a vacuum-tight enclosure. The enclosure protects the coated surface and reduces heat losses by acting as an insulator.

The glass tube cylinder has anti-reflective coating on both the inner and outer surfaces to reduce reflective losses off the glass tube, thereby increasing the transmissivity. Usually, to maintain the tube's insulating properties, getters, or scavengers, are installed in the vacuum space to absorb hydrogen and other gases that may permeate into the vacuum cylinder over time.

2.3.2.4 Process Control of the Solar Field

The solar field system operates under the control of the Field Supervisor Controller (FSC), a computer located in the central control room that communicates with each SCA and with the plant's Distributed Control System (DCS). The FSC collects information from each SCA and from the DCS, and issues instructions to the field as a whole, and/or modular instructions to SCA loops or individual SCAs. It deploys the solar field during the day when weather and plant availability permit, and stows it at night and during high winds.

A weather station located in the power block area provides real-time measurements of weather conditions that affect the solar field operation. Radiation data are used to determine the performance of the solar field. Wind speed data are needed since under high wind conditions the solar field must be stowed. The FSC communicates with the plant's DCS, which coordinates and integrates power block, HTF system, and solar-field operation. The DCS communicates with all subsystem controls, including electrical system equipment, steam cycle controllers, variable frequency drives and balance of plant system controllers via serial data communications. It receives analog and digital inputs/outputs from all instruments and equipment not served directly by dedicated local controllers.

The DCS enters solar field control mode automatically after completing warm-up mode. At the beginning of warm up, the HTF is circulated through a bypass around the power block heat exchangers until the outlet temperature reaches the residual steam temperature in the heat exchangers. The HTF is then circulated through the heat exchangers and the bypass is closed. As

the HTF temperature at the solar field outlet continues to rise, steam pressure builds up in the heat exchangers until the minimum turbine inlet conditions are reached, upon which the turbine can be started and run up to speed. The turbine is synchronized and loaded according to the design specification until its power output matches the full steady state solar field thermal output.

The DCS regulates the flow by controlling the HTF main pump speeds to maintain the solar field outlet temperature of approximately 739 °F (393 °C). Several HTF pumps will be operated in parallel, at the speed required to provide the required flow in the field. However in exceptional cases (e.g., during maintenance), lower numbers of pumps may be used alone, providing up to 70 percent of full flow at nominal pump capacity. If the thermal output of the solar field is higher than the design capacity of the steam generation system, the HTF flow is directed to the salt heat exchanger train. Cold salt is circulated from the cold salt tank, through the HTF heat exchangers, and into the hot salt storage tank. If both the steam generation train and salt heat exchanger trains are fully loaded, collectors within the solar field are de-focused to maintain design operating temperatures.

If the minimal thermal input to the turbine required by the operating strategy cannot be met under the prevalent weather conditions, then shutdown is indicated. Operators would track all solar collectors into the stow position, reduce the number of HTF main pumps to a minimum, and stop the HTF flow to the power block heat exchangers.

During periods when the solar power generating facility is shutdown, the HTF is circulated through the piping in the solar fields at a low flow rate. For most of the year, under typical weather conditions, no supplemental heat is required to keep the HTF flowing freely. However, it is anticipated that on colder winter nights, supplemental heat will be required to ensure the HTF doesn't freeze in the piping. A gas-fired HTF heater, with a rated capacity of 35 million British thermal units per hour (MMBtu/hr), will be provided as part of the HTF system. It is expected that the HTF heater will need to operate approximately 50 hours per year to keep the HTF from freezing.

2.3.3 Power Blocks

The power blocks, including the steam cycle, HTF system and thermal storage system, are located at the center of each solar field. The electrical and local control buildings, workshop buildings, electrical equipment buildings, and water treatment facilities will be located within the power blocks. A list of components contained within each power block, and their general location are shown in Figure 2-4. Major components specific to the power block are briefly described in the following section.

2.3.3.1 Solar Steam Generator System

The solar steam generator system transfers heat from the HTF to the feed water (see Figure 2-3). The steam generated in the solar steam generator is piped to a Rankine-cycle reheat steam turbine. Heat exchangers are included as part of the solar steam generator system to preheat and boil the condensate, superheat the steam, reheat the steam, which is then sent to the steam turbine generator.

The steam expands through the steam turbine generator turbine blades to drive the steam turbine that, in turn, drives the generator, which converts mechanical energy to electrical energy. The Project's steam turbine generator is expected to be a three-stage casing type with high-pressure, intermediate-pressure, and low-pressure steam sections. The steam turbine generator is equipped with accessories required to provide efficient, safe, and reliable operation. Major components include steam stop and control valves, a gland seal system, lubricating and jacking oil systems, thermal insulation, and control instrumentation.

The solar steam generator system and steam turbine generator will be located outdoors and supported on reinforced, concrete mat foundations. The steam turbine generator foundation will include a reinforced concrete pedestal.

2.3.3.2 Power Block HTF System

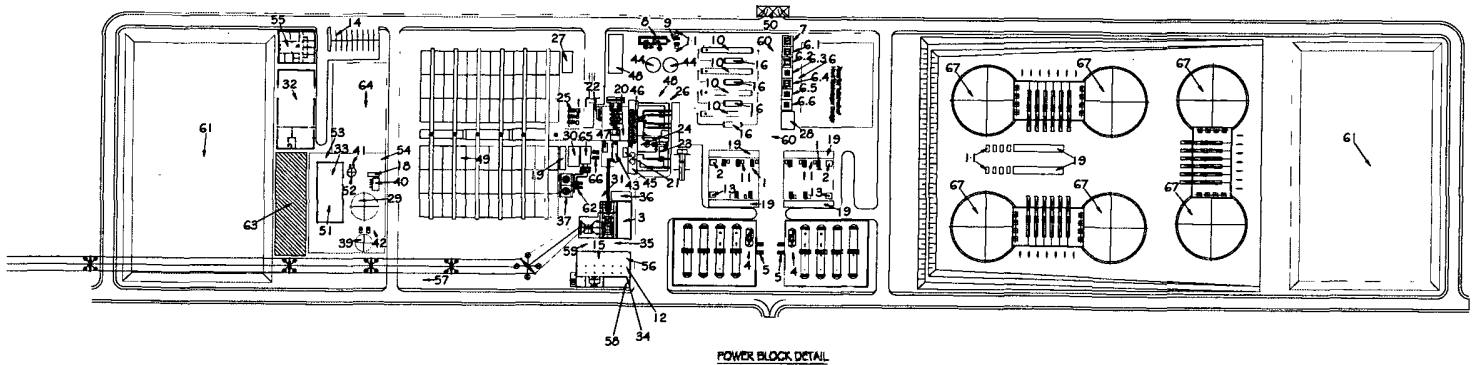
In addition to the HTF piping in the solar field, the HTF system within the power block includes three elements: (1) the HTF heater, (2) the HTF expansion and overflow vessels and (3) the HTF ullage system. To eliminate the problem of HTF freezing, an HTF heater will be installed and used to ensure system temperature stays above 54 °F (12 °C) whenever the unit is off-line. An expansion vessel is required to accommodate the volumetric change that occurs when heating the HTF to the operating temperature.

During plant operation, the HTF will degrade into components of high and low boilers (substances with high and low boiling points). The low boilers are removed from the process through the ullage system. The HTF is removed from the HTF surge tank and flashed, leaving behind high boilers and residual HTF. The flashed vapors are condensed and collected in the ullage system.

Leak detection of HTF will be accomplished in various ways. Visual inspection throughout the solar field on a daily basis will detect small leaks occurring at ball joints or other connections. Such leaks can be corrected via minor repairs or repacking of joints and valves. The configuration of the looped system, allowing different sections of the loops to be isolated, will facilitate the repair of small leaks. Since larger leaks are of a greater concern, detection of large leaks is being proposed by using remote pressure sensing equipment and remote operating valves to allow for isolation of large areas of the loops in the solar field. Details of the design will be developed in the design detail process.

2.3.3.3 Thermal Energy Storage

Each plant will include thermal storage, consisting of three dual, two-tank molten salt systems, sufficient to support approximately 4.5 full load-equivalent hours of electric energy after sundown and on cloudy days. The thermal energy storage system contains hot and cold storage tanks connected via two parallel trains of six oil-to-salt heat exchangers in series. For charging the storage, the salt is heated up to approximately 726.8 °F (386 °C), and for discharging it is cooled down again to approximately 557.6 °F (292 °C).



POWER BLOCK DETAIL
SCALE 1"=100'

1. HTF MAIN PUMPS
2. HTF PUMPS SEAL OIL UNIT
3. SWITCH YARD
4. OVERFLOW VESSEL AND EXPANSION VESSEL
5. OVERFLOW RETURN PUMPS
6. ULLAGE COOLERS AND VESSEL
   - 6.1 HTF STORAGE TANK
   - 6.2 COLLECTING TANK
   - 6.3 RECLAMATION FLASH VESSEL
   - 6.4 RECLAMATION DRAIN VESSEL
   - 6.5 ULLAGE VESSEL 1
   - 6.6 ULLAGE VESSEL 2
7. NITROGEN SYSTEM
8. HTF HEATER
9. FREEZE PROTECTION PUMPS
10. STEAM GENERATORS
11. VARIABLE FREQUENCY DRIVE SYSTEM
12. WEATHER STATION
13. HTF PUMPS LUBE OIL UNIT
14. PARKING
15. BALANCE OF PLANT ELECTRICAL
16. REHEATERS
17. EXCITATION TRANSFORMER
18. WATER TREATMENT MCCS
19. MOTOR CONTROL CENTER
20. STEAM TURBINE
21. GLAND STEAM CONDENSER
22. LUBE OIL CONSOLE
23. DEAERATOR
24. FEEDWATER PUMPS
25. CONDENSATE PUMPS
26. LP/HP PRE-HEATERS
27. VACUUM SYSTEM
28. DIRTY WASTE WATER SUMP, OIL WATER SEPARATOR
29. RAW WATER TANK
30. COMPRESSED AIR SYSTEM
31. GENERATOR CIRCUIT BREAKER
32. WAREHOUSE
33. CHEMICAL INJECTION SKID
34. MAIN AUXILIARY TRANSFORMERS
35. GENERATOR STEP-UP TRANSFORMERS
36. EMERGENCY DIESEL GENERATOR
37. COOLING TOWER
38. FREE FOR USE
39. FIRE AND SERVICE WATER TANK
40. SERVICE WATER PUMPS
41. DEMINERALIZED WATER PUMPS
42. FIRE PROTECTION PUMPS
43. GENERATOR
44. BLOWDOWN TANKS
45. TURBINE DRAINS TANK
46. CONDENSATE TANK
47. STG FEEDC
48. AUXILIARY BOILER
49. AIR COOLED CONDENSER
50. HTF PIPING CONNECTION TO SOLAR FIELD
51. SAMPLE PANEL & LAB BUILDING
52. DEMINERALIZED WATER TANK
53. CHEMICAL FEED CANOPY
54. WATER TREATMENT AREA
55. ADMINISTRATION BUILDING
56. CONTROL BUILDING
57. HIGH VOLTAGE LINE
58. SUS TRANSFORMER & 480 V BUS
59. TAKE OFF TOWER
60. PIPE RACK
61. EVAPORATION POND
62. AUXILIARY COOLING WATER PUMPS
63. SEPTIC SYSTEM FIELD
64. Waste Water Treatment AREAWASTE WATER TREATMENT AREA
65. CLOSED COOLING WATER HEAT EXCHANGERS
66. CLOSED COOLING WATER PUMPS
67. THERMAL STORAGE TANK
68. FREE FOR USE
69. FREE FOR USE
70. FREE FOR USE

0 100 200
SCALE - 1" = 100' FEET

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP

SOLAR MILENNIUM, LLC.

AMARGOSA FARM ROAD SOLAR PROJECT

FIGURE 2-4 DRY COOLED POWER BLOCK DETAIL

DATE: 07-08-10
DRAFTER: NL
DESIGNER: NL
CHECKED: BDP
PROJECT NO.
SML0801.000

FIG. 2-4
SHEET 1 OF 1

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The salt freezes at approximately 429.8 °F (221 °C). Freezing of the salt must be avoided to prevent damage of components. The freeze protection system, which uses the hot HTF, keeps the salt at a minimum temperature of 500 °F (260 °C). To avoid freezing of the salt in non-working periods, the heat exchangers are equipped with electrical heat tracing.

2.3.3.4 Cooling Systems

The proposed Project will utilize a dry-cooling system for heat rejection from the steam cycle consisting of a forced draft air-cooled condenser. In the dry-cooled alternative, the auxiliary cooling water system uses a small wet-cooling tower to cool plant auxiliary equipment, including the steam turbine generator lubrication oil cooler, the steam turbine generator cooler, steam cycle sample coolers, and large pumps. The water picks up heat from the various equipment items being cooled and *rejects* the heat to the cooling tower. This auxiliary cooling system will allow critical equipment such as the generator and HTF pumps to operate cooler and at their design ratings during hot summer months when the Project's power output is most valuable. An average of 130,000 gallons per day of water per day (108 afy) will be consumed by the auxiliary cooling water system; the maximum rate of consumption is estimated to be 197,500 gallons per day during the summer.

2.3.3.5 Buildings within the Power Block

Each power block will contain electrical and local control buildings, workshop buildings, and electrical equipment buildings. All of these buildings will be of pre-engineered metal frame construction and assembled on site. Accessibility to buildings will be in full compliance with applicable codes and standards including the Americans with Disabilities Act. The total footprint area of the buildings in each power block is approximately 31,200 square feet.

2.3.3.6 Buildings within the Shared Facilities Area

Other site buildings will include the main office building, the assembly/warehouse building, and the water treatment building, as well as a number of small, pre-engineered enclosures housing mechanical and electrical equipment. Building columns will be supported on reinforced concrete mat foundations or individual spread footings and the structures will rest on reinforced concrete slabs.

All site buildings will be designed to industrial standards. To minimize visual impacts and improve aesthetics, all site buildings will be painted with appropriate colors to minimize visual contrast with the surrounding landscape. Colors would be selected from the "BLM Standard Environmental Color Chart (CC-001, June 2008)" and/or in consultation with applicable BLM visual resource management staff. For the administration buildings, the layout should incorporate design concepts outlined in the BLM Guidelines for a Quality Built Environment (draft 2010) which includes the effective use of color, form and textures as well as landscaping treatments that reduce contrast and increase aesthetics. Electrical System

The Project electrical components consist of the solar field electrical systems, the electrical system within the power blocks, and the Project switchyard. Transmission of power from the proposed Project will be "wheeled" through Valley Electric Association, Inc.'s (VEA) existing and proposed transmission lines. The proposed point of interconnection will be to a new 230 kilovolt (kV) switchyard to be constructed near Amargosa Farm Road and Power Line Road adjacent to the power plant. In addition to the new substation, VEA will widen its existing transmission right-of-way to accommodate a new, 26.5 mile, double circuit 230kV transmission line from the proposed VEA switchyard adjacent to the Project site to the planned Johnnie substation located on VEA's Mead to Northwest 230kV transmission line approximately 7.5 miles north of Pahrump, Nevada. VEA is responsible for upgrading its transmission system and is preparing a separate NEPA review for that action.

Temporary construction power will be obtained from VEA over one of the 12.47kV transmission lines that feeds out of VEA's Valley substation. Peak construction power requirements are estimated at approximately 3 to 4 MW. Temporary construction power will be distributed within the Project site over the site's internal 12.47kV distribution system.

2.3.3.7 Electrical Generation

Roughly 10 percent of the steam turbine generator output would be used on site for plant auxiliary loads such as motors, heaters, control systems, and general facility loads including lighting and heating, ventilation, and air conditioning. Some of the power needed for on-site uses would be converted from alternating current (AC) to direct current (DC) for power plant control systems and emergency backup systems. Power would be generated by the steam turbine generator (size and generation voltage is dependent on the final generator selection) and stepped up by a fan-cooled generator step-up transformer.

The steam turbine-generators would electrically connect to a 230kV on-site switchyard. The steam-turbine-generators generate electricity at 18kV. This voltage would be increased (stepped-up) in the switchyard to 230kV via a generator step-up transformer. The generator step-up transformer would rest on a concrete pad with a perimeter berm designed to contain the transformer insulating oil in the event of a leak or spill.

The plant site switchyard would be located in the southeast corner of the Project site and would require an overhead steel-reinforced, aluminum conductor unit tie line for the connection to each unit's generator step-up transformer. The switchyard would consist of 230kV switchyard circuit breakers with 230kV disconnect switches on each side of the breaker for breaker maintenance.

The switchyard ground grid will be connected to the generation plant ground grid and will consist of copper conductor throughout the yard with ground rods installed around the perimeter and near major equipment. A layer of aggregate will be installed above grade to increase contact resistance within the fenced switchyard area.

2.3.3.8 Direct Current Power Supply System

An uninterruptible power system will be provided in each unit. The power system will service emergency lighting, the DCS, electrical breakers, and relays. The DC power system will serve as a temporary bridge to the more robust emergency diesel AC power supply in the event external power is suddenly lost.

2.3.3.9 Essential Service Alternating Current System

A 120-volt essential service AC power distribution system serves critical equipment loads, lighting and alarms, and loads that protect equipment from potential damage in the event of sudden loss of station service. This system is served through an inverter that receives power from the DC power supply system.

2.3.3.10 Telecommunications

Site voice and data communications will be supplied from an AT&T fiber optic line located adjacent to the Project site. This will be supplemented with wireless voice communications to meet the construction and operations needs in the solar fields.

2.3.4 Fuel Supply and Use

The auxiliary boiler and HTF heaters will be fueled by propane. Propane will be delivered to the plant site via truck from a local distributor and stored in 18,000-gallon aboveground tanks (one in each power block). The estimated propane usage for the auxiliary boiler per unit for normal operation is approximately 9 MMBtu/hr overnight and approximately 34 MMBtu/hr for 30 minutes during startup each morning. The estimated maximum propane usage for the HTF heater is an additional 41 MMBtu/hr per unit is for approximately 50 hours per year during the winter.

A fuel depot would be constructed within the laydown area to refuel, maintain, and wash construction vehicles, and would occupy an area of approximately 75 feet by 150 feet. It would consist of a fuel farm with two on-road vehicle diesel tanks, each having a 2,000-gallon capacity; two 8,000-gallon off-highway vehicle (OHV) diesel tanks; one 1,000-gallon gasoline tank; and a wash water holding tank. The fuel farm would include secondary spill containment; a covered maintenance area, also with secondary containment; and a concrete pad for washing vehicles.

2.3.5 Water Supply and Use

Under the Proposed Action, the Project would use dry-cooled technology. Water use in a dry-cooled plant would include water for solar collector mirror washing, makeup for the solar steam generator feedwater, dust control, water for cooling plant auxiliary equipment, potable water and fire protection.

2.3.5.1 Water Source

On March 18, 2010, the Proponent filed Application 79699 with the NDWR Nevada State Engineers Office to change the manner of use and place of use of a portion of an existing certificated water right near the Project site. The water right has an annual duty of 603 afy, which has been pumped approximately 413.88 afy on average over the last 25 years (Table 2-3). In addition, the Proponent filed Application 79783 on April 15, 2010 for a new point of diversion for a combined duty with Application 79699 of 400 afy. The Proponent intends to lease the underlying water rights from the water rights holder or Lessor, to withdraw up to 400 afy of groundwater from the Amargosa Desert Hydrographic Basin for a period of 30 years for industrial purposes in connection with the construction and operation of the proposed Project.

Table 2-3 Project Well

Application No.	Certificate No.	Location	Annual Duty (afy)[1]	25-year Average Pumpage (afy)[1]
15893	5717	NE ¼ NE ¼ Sec 23, T16S, R48E	603.00	413.88

[1]One acre-foot equals 325,851 gallons
Source: NDWR 2009a

The Proponent intends to drill a new well and move the point of diversion to a location just west of the current well. This will allow for redundancy should one of the wells fail. Meters will be placed on both wells to ensure there is no exceedance of the permissible annual duty.

A new pipeline will be constructed from the existing points of diversion to the Project site. Pipeline diameters will vary by need and would be sized upon final engineering design. It is estimated that pipeline sizes will range from 8 to 14 inches, depending upon the required flows. The pipeline route would cross the area subject to the proposed right-of-way as well as private lands adjacent to that area. A main waterline will be constructed from the existing point of diversion, located approximately 50 feet southwest of the northeast section corner of Section 23, Township 16 South, Range 48 East. The line will depart the point of diversion (across a private right-of-way) and head in a northeasterly direction approximately 100 feet to fall within the proposed Project right-of-way; it will then head in a northerly direction to the Project power blocks, assembly hall and office building.

To address the NPS, USFWS, and BLM concerns that the proposed groundwater withdrawals associated with the proposed Project—in combination with existing withdrawals in the vicinity of Devils Hole and the Ash Meadows National Wildlife Refuge (NWR)—may pose a risk of adversely affecting federal rights and resources, the Proponent has agreed to acquire an additional 236 afy of existing water rights within the Amargosa Desert Hydrographic Basin. The 236 afy consists of 204 afy identified as "Minimization Water Rights" (see Appendix A), and an additional 32 afy to offset the potential reduction in groundwater return flow as a result of changing the manner of use from agricultural to industrial. The acquisition of the additional 236 afy of existing groundwater in the basin will most likely be obtained from existing water

rights permitted for agricultural use. At this time, it is unknown where the additional water rights will be obtained.

2.3.5.2 Water Treatment

Water used for power (steam) cycle feedwater makeup, mirror washing, ancillary equipment heat rejection, and domestic uses would require treatment for reduction of total dissolved solids (TDS). The groundwater will first be treated by a clarifier, followed by reverse osmosis (RO) and a demineralized process prior to being directed to a demineralized water storage tank. Demineralization is accomplished by either a distillation processes (evaporation/condensation) or membrane processes such as RO or electrodialysis reversal. Selection of the demineralization process to be used at the Project would be made during the final design process, but would not change the assessment of environmental effects included in this Final EIS.

In order to provide the demineralized water quality needed for power cycle makeup, it would be necessary to use ion exchange demineralization as a final treatment step after RO. Ion exchange demineralization can be done using either permanently installed equipment or portable demineralizers. Permanently installed equipment requires regeneration on site, which requires storage and disposal of significant quantities of sulfuric acid and sodium hydroxide (caustic). Alternatively, portable demineralizers are taken off-site for regeneration at the supplier's facility, so no on-site storage of chemicals and disposal of regeneration wastes is required. Off-site regeneration is proposed for the Project. This would eliminate the need to store regeneration chemicals on site and minimize on-site production of hazardous wastes. These demineralizers would be provided as forklift-moveable fiberglass bottles that would be traded out when exhausted and returned to the supplier for regeneration. Demineralization systems would be installed at each power block to minimize piping and provide the best water quality.

To minimize water consumption in the dry-cooled process (see Figure 2-5), process water from the RO unit used to reduce the dissolved mineral content of soften well water may be used for either dust suppression or as make up water for the auxiliary cooling tower. Blowdown from the steam cycle will be used as makeup to the small cooling tower. Blowdown from the auxiliary cooling tower will be sent to the evaporation ponds for disposal.

Reject water is water that has reach a high concentration of solids and is not longer suitable process water use. Reject water will be directed to the evaporation ponds for disposal. Process water is treated water of high quality suitable for cooling water, steam cycle water and dust control.

Up to three covered water tanks would be constructed at each power block. These include a service water tank, a demineralized water tank, and a RO reject water storage tank and dust control water storage tank. Final capacities will be determined during detailed engineering. Each tank will be a vertical, cylindrical, field-erected steel tank supported on foundations, consisting of either a reinforced concrete mat or a reinforced concrete ring wall with an interior bearing layer of compacted sand supporting the tank bottom.

Water from the Project well will be used as a potable water source and may require treatment to meet public health requirements for domestic potable water supplies. The Proponent would use a

desalination process for water treatment. Following desalination, the water would require addition of chlorine to prevent growth of pathogenic organisms. A Public Water System Permit for a non-community water system would be obtained from the NDEP – Bureau of Safe Drinking Water (NRS 445, NAC 445A, 450 through 445A.6731).

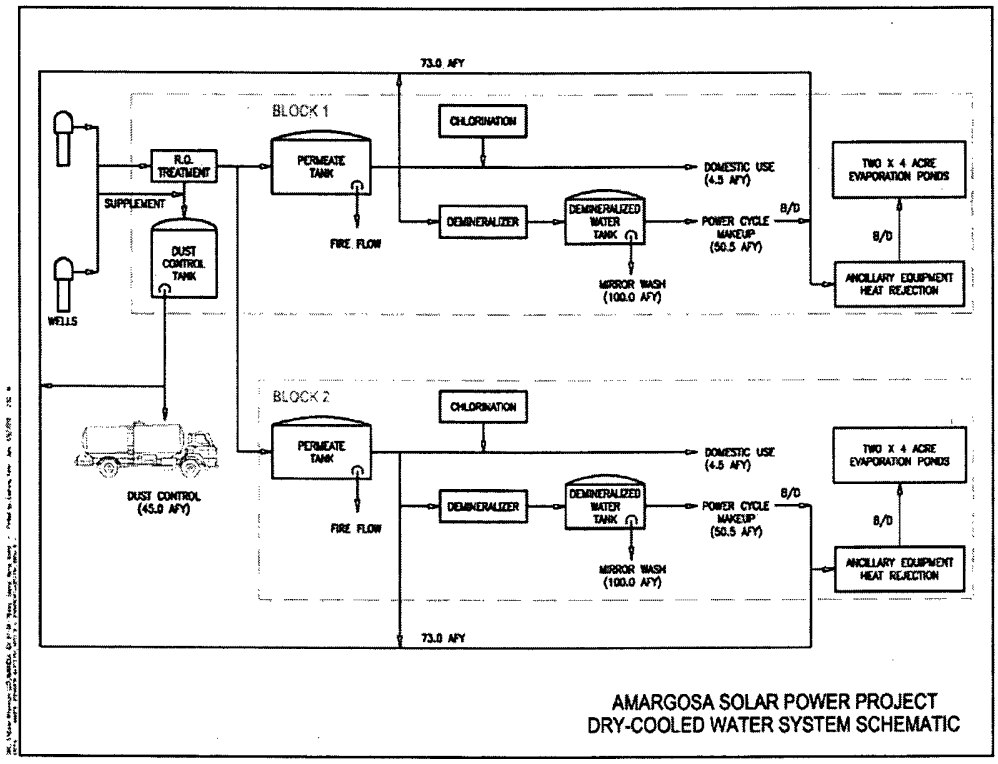

Figure 2-5 Dry-Cooled Water System Schematic

2.3.5.3 Water Needs during Construction

Project construction is expected to occur over a total of 39 months. Average construction water use at the site is estimated to be approximately 752,000 gallons (about 2.3 afy) per working day. Total water use for the duration of the construction phase of the Project is estimated to be approximately 600 afy (1,950 acre-feet over the 39 month construction period). Construction water will be sourced from a well within close proximity to the site and piped to the site for use by the contractor. Potable water during construction will be brought to the site in trucks and held in day tanks. Temporary easements on private land will be in place for the duration of the construction period for access to water wells.

Water needs for construction related activities include:

- Dust control for areas experiencing construction work as well as mobilization and demobilization

- Dust control for roadways
- Water for grading activities associated with both cut and fill work
- Water for soil compaction in the utility and infrastructure trenches
- Water for soil compaction of the site grading activities
- Water for soil stockpile sites
- Water for the various building pads
- Water for concrete pours on site

Dust control during grading will require considerable amounts of water during construction. By minimizing the period of time between initial ground disturbance and installation of the completed solar arrays, water used for construction dust control would be minimized. Sequencing of the grading activities in the solar fields will be performed to minimize the need for dust control water as illustrated in Figure 2-6 below.

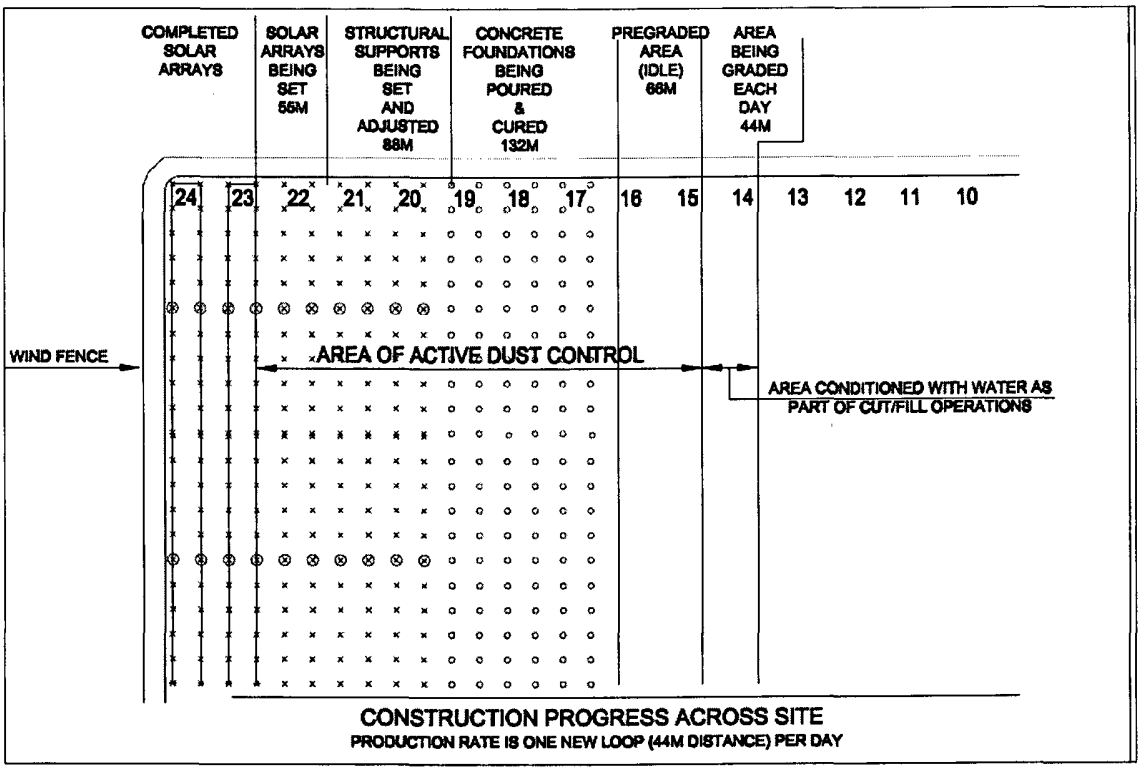

Figure 2-6 Construction Progress Across Site

The NDEP is responsible for administering the state's stormwater management program. The state has also delegated authority to local entities to develop and implement stormwater plans. The NDEP requires all construction sites disturbing more than 1 acre to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage under the federal CWA.

Best Management Practices (BMP) for the minimization of construction water (i.e., the covering of stockpiles of soil, stabilizing roadways, etc.) will also be employed. The *Nevada BMP Guide*, a publication of the NDEP, will be used as a reference in establishing Project-specific BMPs.

2.3.5.4 Water Needs during Operations

Water needs during operation for both the preferred dry-cooled and wet-cooled alternatives are summarized in Table 2-4. Operational water needs for the dry-cooled preferred design and the wet-cooled alternative design are virtually identical for all uses except for the very large additional demand for water for steam cycle condensing of the wet-cooled design.

The average total annual water usage under the dry-cooled option is estimated to be approximately 400 afy, which corresponds to an average flow rate of about 248 gallons per minute. Usage rates will vary during the year and would be higher in the summer months when the peak maximum flow rate could be as much as about 50 percent higher for the ancillary equipment heat rejection process. Equipment sizing would be consistent with peak daily rates to ensure adequate design margin.

Table 2-4 Summary of Operational Water Usage

Rate of Use	Annual Average (afy) Dry-Cooled	Annual Average (afy) Wet-Cooled
Power Cycle Heat Rejection	0	4,409
Power Cycle Makeup Water *	101	101
Mirror Wash Water	200	200
Domestic Potable Water	9	9
Dust Suppression Water	45	45
Ancillary Equipment Heat Rejection	146	0**
Totals (rounded)	400	4,600

* Power cycle makeup will be recycled and is not included in the consumptive use total
** Ancilliary equipment will be cooled with cooling water from the main cooling tower

Cooling constitutes the most significant water use ranging from 4,409 afy for a wet-cooled plant to 146 afy for the dry-cooled alternative. Mirror washing constitutes the largest and second largest water use (200 afy) for dry- cooled and wet-cooled plants, respectively. To facilitate dust and contaminant removal, water from the primary desalination process, RO water, would be used to spray clean the solar collectors on a weekly or as-needed basis, determined by the reflectivity monitoring program. This mirror washing operation is done at night and involves a water truck spraying demineralized water on the mirrors in a drive-by fashion. It is expected that the mirrors will be washed weekly in winter and twice weekly from mid- spring through mid-fall. The

mirrors are angled down for washing therefore water does not accumulate on the mirrors. Wash water falls from the mirrors to the ground and, due to the small volume, soaks in or evaporates with no appreciable runoff. Remaining rinse water from the washing operation is expected to evaporate on the mirror surface.

Power cycle makeup water (101 afy) is water used to replace water lost from low-pressure steam venting at the deaerator, minor leaks in the steam and condensate piping systems, and blowdown from the steam generator drum. The volume of steam cycle makeup water would be similar for both the wet- and dry-cooled options.

For both the wet- and dry-cooled alternatives, the by-product of the RO process, RO process water, may be beneficially reused as water for dust suppression or in the dry-cooled alternative makeup to the auxiliary cooling tower. Dust suppression (45 afy) and domestic potable water use (9 afy) also are similar for both the wet-cooled and dry-cooled options.

2.3.6 Waste Generation and Management

Project wastes would be comprised of non-hazardous wastes including solids and liquids and lesser amounts of hazardous wastes and universal wastes. The non-hazardous solid waste would primarily consist of construction and office wastes, as well as liquid and solid wastes from the water treatment and blowdown systems. Blowdown systems are typically used on the boiler and cooling tower to control dissolved solids concentrations of the working fluids by simply removing or blowing down some of the liquid with a high dissolved solids concentration and replacing it with makeup water, which has a relatively lower concentration of dissolved solids. Non-hazardous solid wastes from the blowdown process include a concentration of the dissolved solids found in the well water plus any chemical additives used to control corrosion,biofouling or scaling in the boiler or cooling tower. Non-hazardous solid wastes would be trucked to the nearest landfill, which is a Class I landfill located in Pahrump with no limit to the amount of daily waste. The alternate disposal location is Las Vegas if a Class II or Class III landfill is required.

Non-hazardous liquid wastes would consist primarily of domestic sewage and process wastewater. To manage the non recyclable non-hazardous domestic sewage wastes, a septic tank and leach field would be installed. Process waste water streams include RO system reject water, boiler blowdown, and auxiliary cooling tower blowdown. Boiler blowdown will be used as part of the makeup water for the auxiliary cooling tower. Auxiliary cooling tower blowdown will be sent to the evaporation ponds for concentration and disposal.

2.3.6.1 Hazardous Materials Management

Hazardous materials to be used during construction will include gasoline, diesel fuel, oil, lubricants, paint, and paint-related products (e.g., primer, paint thinner, other solvents). All hazardous materials used during construction and operation would be stored on site in storage tanks/vessels/containers that are specifically designed for the characteristics of the materials to be stored.

Secondary containment structures will be provided around any oil-filled transformers located outdoors, steam turbine generator lube oil tanks, HTF overflow and expansion vessels and any other oil containing tanks over 55 gallons without double walls or vendor supplied secondary containment. The containment will be sized to contain 125 percent of the fluid in the transformer or vessels with appropriate freeboard required per code. Additional equipment (such as HTF pumps, feedwater pumps, etc.) will be provided with 6-inch-tall curbs as appropriate.

Both construction and operation-phase hazardous waste will be recycled and reused to the extent possible.

Site-specific, safety-related plans and programs would be developed and implemented to ensure safe handling, storage, and use of hazardous materials (i.e., Hazardous Material Business Plan). Plant personnel would be supplied with appropriate personal protective equipment (PPE) and would be properly trained in the use of PPE and the handling, use, and cleanup of hazardous materials used at the facility, as well as procedures to be followed in the event of a leak or spill. Adequate supplies of appropriate cleanup materials would be stored on site.

The preparation of the SPCC Plan is the responsibility of the facility owner/operator (in this case, Solar Millennium); however, it must be certified by a professional engineer. By certifying the SPCC Plan, the Professional Engineer, having examined the facility in question, attests that: (1) he/she is familiar with the requirements of part 112; (2) he/she or an agent has visited and examined the facility; (3) the Plan has been prepared in accordance with good engineering practices, including consideration of applicable industry standards, and with the requirements of part 112; (4) procedures for required inspections and testing have been established; and (5) the Plan is adequate for the facility. Regardless of who prepares the SPCC Plan, it is the owner/operator who is responsible for complying with the Rule. A copy of the Rule is available at www.epa.gov/oilspill.

2.3.6.2 Wastewater

The preferred dry-cooled Project would produce four primary wastewater streams:

- Non-reusable sanitary wastewater produced from administrative centers and operator stations;
- Non-reusable cooling tower blowdown and;
- Partially recyclable boiler blowdown (to be used as cooling tower makeup) shall be directed to the evaporation ponds.

The amount of non-reusable sanitary wastewater produced depends on the number of people using the facilities, how the water is used (e.g., toilets, showers, kitchen sinks, etc.), and the types of facilities provided (e.g., port-a-johns, low-flush toilets, potable drinking water, etc.). Up to 9 afy will be required for potable water use.

Under either alternative, RO process water will be beneficially reused in conjunction with BLM-approved palliatives for dust control and as make up to the auxiliary cooling tower.

2.3.6.3 Wastewater Treatment

Waste stream associated with a dry-cooled plant include (1) auxiliary cooling tower blowdown, (2) boiler blow down, and (3) RO/ Demineralizer water reject. These waste streams will be recycled as much as possible to a RO system for recovery. The RO system is a high efficiency reverse osmosis system designed primarily for handling high total dissolved solids waste water streams. The RO system will recover 70 percent or more (depending on water quality) of this waste stream and will significantly limit the size of the required evaporation pond(s). In certain operational conditions such as during start up, some of the waste water sources such as auxiliary cooling tower blowdown or boiler blowdown, may not be recoverable and would be sent directly to an evaporation pond.

The waste water treatment system would require two 4-acre evaporation ponds per power block. Two ponds were selected for reliability. The plant would operate on one pond for approximately 24 months, and then switch to the second pond. Approximately 18 months would be required for one pond to evaporate and be ready for use again. If a pond requires maintenance or solids removal, the plant still could operate with the other pond. The evaporation ponds would be double-lined and covered with narrow-mesh netting to prevent access by ravens and migratory birds in accordance with applicable regulations. If required, residual non-hazardous solid wastes would be trucked to the nearest landfill, which is a Class I landfill located in Pahrump. The alternate disposal location is Las Vegas if a Class II or Class III landfill is required. The above waste streams will be determined in the 401 Wastewater permit decision.

Sanitary wastes produced during construction would be held in chemical toilets and transported off-site for disposal by a commercial chemical toilet service. Any other wastewater produced during construction such as equipment rinse water would be collected by the construction contractor in Baker tanks and transported off-site for disposal in a manner consistent with applicable regulatory requirements.

During operations, sanitary wastes would be collected for treatment in septic tanks and disposed via leach fields located at the power block and at the administration and warehouse areas. Smaller septic systems would be provided for the control room buildings to receive sanitary wastes at those locations. Based on the current estimated average of 185 employees on a 24-hour, 7 day per week work schedule, a total leach field area of approximately 16,500 square feet would be required. It might be economical and expedient to provide permanent, portable, chemical toilets at remote areas of the operational Project site.

At this time, the leach field is anticipated to be sited adjacent to the bioremediation field. However, the final location will be determined following additional engineering design. The Proponent would coordinate the development of the leach field and bioremediation facility with NDEP as part of their permitting and approval process with that agency.

2.3.7 Bioremediation Unit

The HTF for the solar fields will be diphenyl/biphenyl oxide. Dowtherm A and Solutia VP-1 are commercial products that have been used in concentrated solar trough plants to date. The diphenyl/biphenyl oxide mixture is not classified as a hazardous material by the USDOT, nor is

it listed under EPA CERCLA regulations. However, this material, when discarded, may be a hazardous waste as that term is defined by the Resource Conservation and Recovery Act (RCRA), 40 CFR § 261.24, due to its toxicity characteristic.

While the collector design has advanced to an excellent level of performance and reliability, occasional small spills of HTF can occur, primarily due to equipment failures. Spill management procedures would be implemented to report, contain and clean up any such spill. If a line worker or other staff observes a spill or release, the system operators in the power block would be notified and the affected collector loop promptly shut down. An appropriately equipped crew would make any necessary equipment repairs and remove any hazardous wastes to an on-site bioremediation facility that utilizes indigenous bacteria to digest the hydrocarbon contamination.

The two solar fields would share the same bioremediation unit to bio-remediate or land farm soil contaminated from releases of HTF. Each bioremediation facility would comprise an area of about 400 feet by 800 feet (7 acres total). Each bioremediation facility would utilize naturally occurring bacteria to metabolize hydrocarbons contained in HTF contaminated soil. A combination of nutrients, water, and aeration facilitates the bacterial activity where microbes restore contaminated soil within 2 to 4 months. If required, remediated soils will be disposed of in an approved off-site landfill following decontamination.

2.3.8 Fire Protection

A Construction Fire Protection and Prevention Plan will be developed and followed throughout all phases of construction. The permanent facility fire protection system would be put into use during construction as soon as is practicable. Prior to the availability of this system, fire extinguishers and other portable fire-fighting equipment would be available on site. All equipment would be National Fire Protection Assocition (NFPA) and Occupational Safety and Health Administration (OSHA) compliant. Locations of portable firefighting equipment may include portable office spaces, welding areas, flammable chemical areas, and vehicles and other mobile equipment.

Once the Project is operational, an on-site fire protection system, designed in conformance with the NFPA and International Fire Code 2006 edition with Nevada State Fire Marshal Amendments, would be provided to limit personnel injury, property loss, and downtime in the event of a fire. The system would include a fire protection water system and portable fire extinguishers. Separate fire flow storage tanks would be sited within each of the two power blocks and an additional storage tank may be required for the Assembly Hall depending upon the final location of the structure. Firewater would be sourced from the Project well, and would be pumped to the site and stored in tanks for fire suppression. On-site fire pumps would be required to deliver water to the fire protection piping network for each of the buildings located within the power blocks.

During operations, all personnel who are actively involved in facility operations, such as plant operators, power plant maintenance personnel, security guards, solar field technicians and service personnel, will be trained to NHPA standards and provided information on the location and use of all onsite fire protection equipment and systems.

Personnel will have access and the support of the facility fire protection systems that address functional operations. The systems include a fire protection water system, foam generators, foam trucks, carbon dioxide fire protection systems, and portable fire extinguishers. Firewater would be supplied from water storage tanks located at each of the two power blocks on the site. One electric and one diesel-fueled backup firewater pump, each with a capacity of 5,000 gpm, would deliver water to the fire protection piping network. The piping network would be configured in a loop so that a piping failure can be quickly isolated with shutoff valves without interrupting water supply to other areas in the loop. Fire hydrants would be placed at intervals throughout the project site that would be supplied with water from the supply loop. The water supply loop would also supply firewater to a sprinkler deluge system at each unit transformer, HTF expansion tank and circulating pump area and sprinkler systems at the steam turbine generator and in the administration building. The use of foam trucks for HTF related incidents will be the primary response in combination with valve closures. Fire protection for each solar field would be provided by zoned isolation of the HTF lines in the event of a rupture that results in a fire.

In the event additional fire support is needed, the Amargosa Valley Volunteer Fire Department would be contacted. The Amargosa Valley Volunteer Fire Department Station is located at 851 E. Amargosa Farm Road, which is approximately 1.3 miles from the southeast corner of the solar field. If needed, mutual aid would be provided by the Beatty, Pahrump and Mercury fire departments.

Finally, as per the Nye County Development Agreement (Appendix F): "Developer shall annually, for as long as the ASPP is operating, provide emergency and fire protection training for up to four (4) individuals identified by County. County shall give priority to individuals who serve in the Amargosa Volunteer Fire Department. Such training shall be the equivalent of training provided to Developer's on-site personnel." In addition, the "Developer shall provide County, in a location selected by Developer, for as long as the ASPP is operating, access to a water supply for County's use in responding to fires within the Town of Amargosa. County agrees to utilize the water supply only for such purposes."

2.3.9 Telecommunications and Telemetry

The Project would have telecommunications service from providers who serve the Amargosa Valley area. Voice and data communications would be supported by a fiber optic system. This system would be augmented with wireless telecom equipment, particularly to support communication with Project staff dispersed throughout the large Project site.

With respect to telemetry, the Project would utilize electronic systems to control equipment and facilities operations throughout the Project site. Detailed information about the telemetry system to be used has not yet been developed at the current stage of the Project engineering design process. Information will be available once final engineering designs are complete.

2.3.10 Lighting System

On-site nighttime lighting for safety and security will be required during construction and operation. To reduce off-site lighting effects, as well as to reduce the energy requirements, an illumination study of proposed luminaries will be completed prior to the completion of a lighting plan design for optimum lighting placement. Lamp efficiency will also be factored into the lighting plan design, ensuring the avoidance of white-light bulbs. Luminaires will emit less than 1 percent of luminous flux above the horizon by incorporating the following design features:

- flat lens or full-shields
- luminaries classified as 'full cutoff'
- installation of luminaries under overhangs where feasible
- aim lighting where it is most needed for safety
- use timers and motion sensors to extinguish lights not in use
- set specific hours for lighting use for typical nights

AC lighting will be the primary form of illumination, but DC lighting will be included for activities or emergency egress required during an outage of the plant's AC system.

2.3.11 Roads, Fencing, and Security

Access to the Project site will be from Amargosa Farm Road via Valley View Boulevard. As stipulated in the Nye County Development Agreement (Appendix F), prior to commencement of construction, the Proponent is required to submit a Master Traffic Impact Analysis for review and approval by the County. The analysis will assess the construction and operations traffic and the impacts, if any, of the transportation of employees and equipment to and from the Project site. If the study determines that improvements are required, the Proponent will provide improvements required in the approved Master Traffic Impact Analysis in order to mitigate the traffic impacts of the Project.

The locations of the principal site entry gates for both the construction and the commercial operating period will be evaluated in consultation with the BLM, NDOT and Nye County Public Works to ensure that ingress and egress from the site does not have adverse impacts on existing traffic flow patterns.

Amargosa Farm Road is an existing public roadway maintained by Nye County Public Works. The roadway consists of 24 feet of asphalt/concrete pavement and roadside ditches on both sides. Amargosa Farm Road would be realigned, approximately 1,320 feet (0.25 mile) south of the existing roadway. The proposed roadway alignment would be coordinated with Nye County Public Works and be reconstructed in conformance with current standards.

Only a small portion of the overall plant site would be paved. Paved areas would include the site access road, the service roads to the power blocks, and portions of the power block (paved parking lot and roads encircling the steam turbine generator and solar steam generator areas). The remaining portions of the power block would be gravel surfaced. The solar field would remain unpaved and without a gravel surface in order to prevent rock damage from mirror wash vehicle traffic. An approved dust-suppression coating would be used on the dirt roadways within and around the solar field. Roads and parking areas located within the power block area and adjacent to the administration building and warehouse would be paved with asphalt.

The solar field and support facilities perimeter would be secured with a combination of chain-link and wind fencing. Chain-link, metal-fabric security fencing, 8-feet tall, with barbed or razor wire on top would be installed along the north and south sides of the facilities. Thirty-foot-tall wind fencing comprised of A-frames and wire and fabric mesh would be installed along the east and west sides of each solar field. The wind fence would be designed to serve two purposes; protect the solar field from blowing dust and sand and partially screen the solar facilities from surrounding properties and viewscapes. Controlled access gates would be located at the site entrance. In addition, the Project site will be surrounded by tortoise-proof fencing to prevent any Desert Tortoise from becoming entrapped by the flood control channels or impacted by work occurring within the facility.

Along the east side of the Project area, an introduced landscape buffer will be added between the perimeter fencing and Sandy Lane as per the Nye County Development Agreement (Appendix F). The buffer will include walking trails and vegetation.

2.3.12 Temporary Construction Workspace, Yards, Staging Areas

An assembly hall would be built for field fabrication facilities and storage of equipment. This building, to be located south of the Amargosa Road realignment, might become permanent depending on the need for additional permanent warehouses for spare parts or maintenance work. Indoor storage space would be required only for weather sensitive items such as control/electrical panels, or small parts that could easily be misplaced. Some space for material requiring temperature and humidity control would be provided. Other items would be stored outdoors on raised platforms with proper covers or temporary shelters. Construction-area lighting will be provided at the warehouse locations. At the areas designated on the site laydown plan, construction subcontractors would provide their own warehousing facilities needed for their materials.

In addition to the permanent plant roads and parking, construction roads and parking would be required to provide access to construction facilities and the laydown area. Construction parking space would be provided near the construction office complex and construction laydown areas. Temporary roads would be all-weather, gravel surfaced; have sufficient width; and be effectively located to accommodate high-efficiency construction traffic. The parking area would have barriers to control parking patterns. The construction parking area, which will be used for both phases of construction, would accommodate approximately 400 vehicles.

Following contruction, temporary use areas would be revegetated and restored following BLM guidelines. Restoration efforts will minimize soil erosion and the potential for fugitive dust from disturbed sites.

2.3.13 Site Drainage and Earthwork

The existing topographic conditions of the Project site show an average slope of approximately 1 foot in 200 feet (0.5 percent) and general sloping in a southwesterly direction. The site consists of desert shrub and is traversed by numerous intermittent and braided washes within the Fortymile Wash watershed. The Fortymile Wash consists of an approximate 330-square-mile drainage area measured to the southern property line of the Project site. The section of the Fortymile Wash impacting the site is considered alluvial, based on site field investigation and review of aerial photography. The apex of the Fortymile Wash is clearly identifiable approximately 0.5 mile north of US 95. Under existing conditions, three primary discharge locations along the southern property boundary are apparent. It is the objective of the Project's stormwater management plan to perpetuate stabilized discharge in both quantity and manner at these three historic locations. A conceptual Stormwater Drainage Plan is provided in Appendix E.

The Project site would be graded generally following the existing contours of the site in order to minimize the amount of disturbance and to allow a balanced distribution of material. Flood protection of the property from off-site flows would be provided by means of a continuous concrete lined channel around the northern and western perimeter of the site, within the fence line. The channel would be designed to effectively intercept the 100-year storm event off-site runoff and convey the concentrated flow to the southwest corner of the property. The southwest corner of the property has been identified as one of the historic discharge locations of the Fortymile Wash. The channel would discharge within the property limits and energy dissipation facilities would be provided in order to disperse the concentrated flow back to a shallow sheet flow condition before the flow leaves the property boundary.

Additionally, a concrete lined channel is proposed along the eastern side of the solar field, inside the fence line, in order to intercept and collect flows impacting the site from the east (see Figure 2-1 and Figure 2-2). Similar to the Fortymile Wash channel, the concentrated flow would be released on the property in its historic location and an energy dissipation facility would be provided in order to return the flow to a shallow sheet flow condition before the flow leaves the property. Perimeter channels are recommended to be concrete lined due to the high velocity potential and for maintenance reasons. Off-site flows would be intercepted and conveyed around the site to ensure no direct contact with on-site stormwater runoff.

Due to the size of the solar field area, the site itself has potential to generate large storm flows during a rain event. For this reason, stormwater control facilities would be constructed to protect on-site facilities, and to convey stormwater runoff to historic discharge locations in both quantity and manner of flow.

The four primary (major) onsite channels, traversing the site north to south, provide 100-year event stormwater runoff interception from four equal divisions of the entire Project site. The two

power block areas contain the most sensitive equipment on the site and are therefore each located along one of the primary channels; thus achieving flood protection during a 100-year storm event. The stormwater runoff generated between the primary channels would be collected in a series of swales and small channels that would direct the flow to the appropriate primary channel.

All minor channels within each section would be designed to intercept and convey the 25-year storm event. Stormwater runoff in areas between the primary channels and in excess of the 25-year event would consist of sheet flow (shallow depth, low velocity) below the solar trough systems. This flow would eventually be intercepted by an appropriate primary channel prior to impacting a power block area. This concept was selected in order to reduce costs for on-site drainage facilities, while still providing desired flood protection.

All primary channels would be concrete lined. Concrete lined channels have been proposed for the following reasons: (1) to achieve channel reliability and integrity; (2) to provide a means for routine maintenance and sediment deposition removal; and (3) to achieve necessary channel width in conformance with the site design space limitations. Various culvert facilities would be utilized to convey storm flow below essential on-site and off-site roads for access and movement around the site.

In addition to conveyance facilities, an on-site detention basin would be used to limit post-development flows to pre-development limits. In 2009, a regional flood control alternative was presented to the BLM and Nye County staff. This alternative would provide a regional off-site detention basin at the apex of the Fortymile Wash located north of US 95 and would effectively and considerably reduce existing condition peak storm flow downstream of US 95. Reducing off-site peak flows impacting the site allows for a reduction in the size of the perimeter flood control facilities needed to protect the Project site. All properties downstream of the detention basin would benefit from this approach. Although all parties agreed to pursue this approach, coordinated funding, schedule variations, and design responsibility for such a facility were determined to be an overwhelming challenge at this time. Therefore, the alternative of building a regional detention basin north of US 95 is unlikely and the Project is proposing independent flood protection.

The power blocks would generally drain by sheet flow or swales to a small detention basin located near the power block. These basins would be designed to retain for a short duration prior to outfall to the nearest primary channel. Oil and chemical storage areas within the power blocks would have their own containment features.

The preliminary site grading plan is designed to be balanced; no import or export of soil is expected for general earthwork. When the geotechnical investigation report is available for the site, the grading plan would be adjusted to account for any loss in elevation that could occur. Engineered fill would be provided as required for equipment and structure foundations if recommended by the geotechnical report. Only soil material that has been approved by the BLM, in consultation with a licensed geotechnical engineer would be used for structural fill. Additionally, granular material might need to be imported for the use as road base and possible use below foundations. Grading of the site would commence at the beginning of the construction period and last over a period of approximately 24 months. Such an extended grading period

would require less water on a daily basis for grading operations and would require dust control over a smaller area at any given time. The total amount of cut is estimated to be approximately 7,500,000 cubic yards. The total amount of fill is currently estimated at approximately 8,900,000 cubic yards. As discussed above, once the final geotechnical report is available, the final grading plan will be prepared. The final grading plan will be adjusted to achieve a balanced site, with minimal to no import or export of material.

During construction and operation, a comprehensive system of management controls, including permanent and temporary site-specific BMPs, to minimize stormwater contact with contaminants and sediment transport would be implemented. An NOI application and Stormwater Pollution Prevention Plan (SWPPP) in accordance with the State of Nevada, NPDES Stormwater General Permit NVR 100000 will be filed with the NDEP prior to the initiation of any construction activities. The SWPPP will utilize BMPs for the environmental control of stormwater discharges to off-site areas that may be attributed to Project activities. The SWPPP will contain a comprehensive procedure for inspecting and repairing BMPs. The management controls may include:

- Erosion and sediment control BMPs during construction activities such as silt fence, straw waddles, gravel bags, dust control, inlet protection, and sediment traps
- Employee training program
- Good housekeeping programs
- Preventive maintenance programs
- Structural BMPs:
  - Temporary containment during maintenance activities
  - Permanent erosion and sediment control BMPs such as detention/sediment basin, diversion berms, riprap stabilization, concrete lined channels, and energy dissipation devices
  - Permanent secondary containment structures at chemical storage and process areas
- Materials, equipment and vehicle management practices
- Spill prevention and response programs
- Inspection programs

2.3.14 Construction Schedule, Manpower, and Sequencing

Construction would be managed by the Proponent. Several dozen major and minor subcontractors would be hired to undertake the myriad of mechanical, civil and electrical construction tasks. Prior to mobilization for construction, a detailed construction plan will be developed to define the construction supervisory and technical field organizations and staffing levels required for the Project. Major milestones of the planned construction schedule are as follows:

- Begin construction: fourth quarter 2011
- Unit #1 start of commercial operations: mid 2014
- Unit #2 start of commercial operations: by mid 2014/2015

Project construction is expected to occur over a total of 39 months. The Proponent would phase construction so that the first power plant would be operational approximately 1 year before the second plant becomes operational. Project construction will require an average of 650 employees over the entire 39-month construction period, with manpower requirements peaking at approximately 1,300 workers in Month 17 of construction. The construction workforce would consist of a range of laborers, craftsmen, supervisory personnel, support personnel, and management personnel. Chapter 3.9 – Socioeconomics provides a breakdown of the construction workforce by skill over the entire construction period.

Temporary construction parking areas would be provided within the power plant site adjacent to the laydown area. The plant laydown area would be used throughout the build out of the two solar units. The construction sequence for plant construction includes the following general steps:

- Site Preparation: This includes detailed construction surveys, mobilization of construction staff, grading, and preparation of drainage features. Grading for the solar field, power block, and drainage channels would be completed during the first 24 months of the construction schedule. Pre-construction survey work would consist of staking/flagging right-of-way and site area boundaries, work areas (permanent and short term), cut and fill staking, access and roads, transmission structure centers, foundation structure staking, and desert tortoise/endangered plants offsets. Staking/flagging would be maintained until final cleanup or reclamation.

- Linears: This includes the site access road and telecommunication line. The site access road and telecommunication line would be constructed during the first 6 months of the construction schedule in conjunction with site-preparation activities.

- Foundations: This includes excavations for large equipment, footings for the solar field, and ancillary foundations in the power block.

- Major Equipment Installation: Once the foundations are complete, the larger equipment will be installed. The solar field components would be assembled in an on-site erection facility and installed on their foundations.

- Balance of Plant: With the major equipment in place, the remaining fieldwork would be piping, electrical, and smaller component installations.

- Testing and Commissioning: Testing of subsystems would be conducted as they are completed. Major equipment would be tested once all supporting subsystems are installed and tested.

2.3.15 Operations and Maintenance

The Project site would be staffed 24 hours a day, 7 days per week during operations. A total estimated workforce of 100 full-time employees would be needed to staff the first phase of the Project (Unit #1). When the second of the 2 units comes online, a total of 170 to 200 full-time staff would be needed. The operations workforce would consist of plant operators and maintenance technicians working 12-hour shifts, and administrative personnel working 8-hour shifts per day.

Maintenance activities during operations would include daily inspection of field components, condition assessment of critical equipment, and routine lubrication of equipment. Some specialized maintenance would be performed by the equipment provider or other specialist contractors. Long-term maintenance would be performed against a defined service and replacement schedule.

Mirror washing would be conducted at night and involves a water truck spraying treated water on the mirrors in a drive-by fashion. It is expected that the mirrors would be washed weekly in winter and twice weekly from mid- spring through mid-fall.

Under normal circumstances, the plant switchyard would be controlled remotely, and routine inspections by personnel would occur on a monthly basis or as needed under emergency conditions. In addition, all of the switchyard structures would be inspected from the ground on an annual basis for corrosion, misalignment, and foundation condition. Ground inspection would include the inspection of hardware, insulator keys, and conductors. This inspection also would check conductors and fixtures for corrosion, breaks, broken insulators, and bad splices.

Road maintenance would be performed as needed. Paved roads would be swept, sealed, and/or overlaid as needed. Grading and drainage would be maintained for gravel and earthen roads.

A noxious weed management plan will be developed by the Proponent in consultation with the BLM. This plan will be implemented throughout the life of the Project to prevent the introduction and spread of noxious weeds as a result of Project activities.

2.3.16 Decommissioning

The lifespan of the proposed Project is expected to be at least 30 years. At the end of the Project's useful lifespan, the facilities would be either repowered or decommissioned. Due to the excellent solar resource at the Project site, repowering is a viable option. This might involve replacing the existing parabolic troughs with components that are more efficient, thereby extending the useful lifespan of the Project. Decommissioning would adhere to the requirements of appropriate governing authorities and would be in accordance with all applicable federal, state, and local law, regulations, and permits, including any reclamation requirements BLM specifically adopts for utility-scale solar projects. For this particular site, the decommissioning process would involve steps to dismantle and remove equipment, permanently stabilize soil and drainages, and regrade and reshape features as necessary. Consistent with BLM requirements, a detailed decommissioning plan would be developed in a manner that both protects public health and safety and is environmentally acceptable.

If approved, the right-of-way authorization for the proposed Project would include a required "Performance and Reclamation" bond to ensure compliance with the terms and conditions of the right-of-way authorization, consistent with the requirements of 43 CFR 2805.12(g). The "Performance and Reclamation" bond will consist of three components. The first component will be hazardous materials, the second component will be the decommissioning and removal of improvements and facilities, and the third component will address reclamation, revegetation, restoration and soil stabilization.

2.4 WET-COOLED ALTERNATIVE

Under the wet-cooled alternative, the Proponent would construct and operate two wet-cooled solar power plants, each with a nameplate capacity of 250-MW and a net output of approximately 242 MW. Each solar plant would be equipped with thermal storage capability and associated linear facilities. Construction and operation of a wet-cooled project would be similar to a dry-cooled plant. Plant components and layout are similar under both the wet- and dry-cooled alternatives; the primary differences are the amount of water used for plant operations, the need for cooling towers for heat rejection from the steam cycle for the wet-cooled alternative, and the area needed for the evaporation ponds. Table 2-2 lists the plant components for both the wet- and dry-cooled alternatives.

The wet-cooled alternative provides more efficient performance than the dry-cooling alternative. Specifically, the wet-cooled alternative offers approximately 11 MW greater electrical output during peak summer conditions than the dry-cooled alternative. The performance of the wet-cooled alternative is enhanced because wet-cooling relies primarily on evaporative cooling to remove heat from the circulating water. In contrast, a dry-cooled alternative uses convective heat transfer, which operates similar to a car's radiator. In the dry-cooled alternative, an air cooled condenser using a large array of fans that force air over finned tube heat exchangers cools the steam turbine-generator exhaust steam.

2.4.1 Water Source

Under the wet-cooled alternative, the well identified for use under the dry-cooled alternative, would supply a portion of the water required for operations. However, additional water supplies would be required under the wet-cooled alternative. The Proponent would either lease or purchase existing certified water rights for water needs during construction and operation of the proposed Project. The source of this additional water would be dependent on the availability of other water rights available for lease or sale in the Amargosa Desert Hydrographic Basin.

2.4.2 Water Use and Treatment

Water use under the wet-cooled alternative would include water needed for the wet cooling tower used to cool the steam cycle; water for solar collector mirror washing; makeup for the solar steam generator feedwater; dust control, potable water and fire protection. The large cooling tower required for the wet-cooled design replaces the small auxiliary cooling tower and the air-cooled condenser used in the dry-cooled thermal power plant design. Well water treated

in a water softening process will be used as the primary makeup water source for the cooling tower. In addition blowdown from the steam cycle would be used as a feed stream to the cooling tower (Figure 2-7). The greater volume of blowdown generated with the wet-cooled system, would be sent to evaporation ponds for disposal.

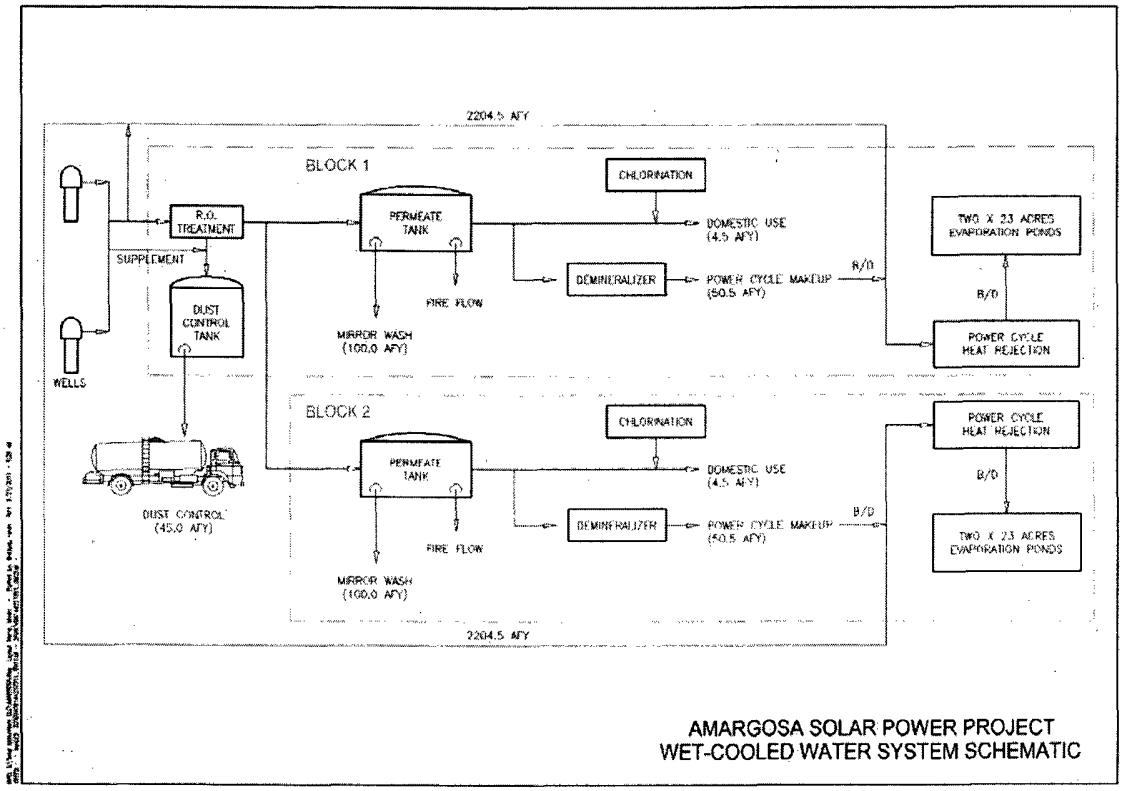

Figure 2-7 Wet- Cooled Water System Schematic

To maintain the chemistry of the water circulated in the cooling tower within an acceptable range, a combination of chemical addition, comprised primarily of an acid feed to inhibit scaling and a biocide to prevent biological growth, and continuous blowdown to control the concentration of total dissolved solids, would be used. Approximately 6 percent of the cooling tower flow would be blowndown and treated in a high efficiency RO system. Approximately 80 percent of this water would return to the cooling tower after processing. The remaining, high conductivity, RO reject water, approximately 88 afy, would be sent to evaporation ponds for disposal.

2.4.3 Wastewater

The wet-cooled alternative Project would produce similar wastewater streams as the dry-cooled alternative. The sanitary wastewater and reuseable water streams will be similar to the preferred dry-cooling option, with the exception that excess RO reject water and some of the steam generator blowdown would be used to supplement makeup flows into the large cooling tower. Cooling tower blowdown will be treated in a similar RO system as used in the dry-cooled alternative and recycled to the extent possible. As with the dry-cooled system, the waste stream from the RO system will be sent to the evaporation ponds for disposal.

2.5 NO ACTION ALTERNATIVE

NEPA regulations require that EIS alternative analyses "include the alternative of no action" (40 CFR §1502.14(d)). The No Action alternative must be included in the analysis so that the EIS clearly evaluates the consequences between the alternative methods of developing the proposed Project and the option of no development. In other words, the No Action Alternative provides a useful baseline for comparison of the environmental effects of the other alternatives. For this analysis, no action means that the BLM would reject the Proponent's proposal and would not grant the requested the right-of-way. Because the Project facilities would not exist, potential adverse environmental effects would not occur.

2.6 AGENCY-PREFERRED ALTERNATIVE

The BLM preferred alternative is the Proposed Action – Dry-cooled Alternative. The environmental consequences of the Proposed Action and Alternatives are described in Chapter 4 and summarized and compared in Table ES-1-4.

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CHAPTER 3 - AFFECTED ENVIRONMENT

This chapter describes the affected environment associated with the construction and operation of the proposed Project. The affected environment is the physical area that bounds the environmental, sociological, economic, or cultural features of interest that could be impacted by the Proposed Action or alternatives. When preparing this EIS, the best available information was used to describe existing environments and the proposed facilities and activities. The information serves as a baseline from which to identify and evaluate environmental changes resulting from construction and operation of the proposed Project. The baseline conditions, for the purposes of analysis, are the conditions that currently exist.

In the following sections, the term "Project area" refers to the area that encompasses the proposed right-of-way and associated project components, such as the access road and project wells as well as the area immediately adjacent to the proposed facilities. The study area, or ROI, varies depending on the resource being analyzed and the predicted locations of direct and indirect impacts from the Proposed Action or alternatives. The APE, as used in the Cultural and Historic Resources section, is synonymous with the Project area.

The following resources are considered in the evaluation of the Proposed Action and alternatives in the Final EIS:

- Section 3.1 - Air Quality
- Section 3.2 - Geological Hazards and Mineral Resources
- Section 3.3 - Soil Resources
- Section 3.4 - Water Resources
- Section 3.5 - Noise
- Section 3.6 – Biological Resources include Vegetation and Wildlife Resources
- Section 3.7 - Paleontological Resources
- Section 3.8 - Cultural and Historic Resources
- Section 3.9 - Socioeconomic Resources
- Section 3.10 - Environmental Justice
- Section 3.11 - Land Use, Recreation, Transportation, and Access
- Section 3.12 - Visual Resources
- Section 3.13 - Health and Safety/Hazardous Materials

3.1 AIR QUALITY AND CLIMATE

This section describes the existing meteorological and air quality conditions in and around the proposed Project and existing emission sources. Air quality data were obtained from existing literature, agency files, and meteorological data from local monitoring stations.

In Nevada, air quality management areas typically comprise a valley, a portion of a valley, or a terminal basin. The air quality ROI for the proposed Project incorporates portions of Nye County in Nevada and portions of the Death Valley National Park in Inyo County, California, within the Amargosa Desert Hydrographic Basin #230.

3.1.1 Regulatory Framework

The EPA implements and enforces the requirements of most federal environmental laws. The EPA Region 9 administers federal air programs in Nevada, including oversight of the State of Nevada, Department of Environmental Protection and Clark County, Department of Air Quality and Environmental Management which are responsible for implementing those programs within their jurisdiction. The Clean Air Act most recently amended in 1990, provides the EPA with the legal authority to regulate air pollution from stationary, area, and mobile sources.

Pursuant to the federal Clean Air Act of 1970, 42 USC § 7401 et seq. as amended in 1990, the EPA has established primary and secondary National Ambient Air Quality Standards (NAAQS) for criteria pollutants. The criteria pollutants under the NAAQS include ozone (O_3), NO_2, lead (Pb), CO, SO_2, and PM. The Nevada air quality standards are the same as the NAAQS, with the exception of a more restrictive CO standard in locations with a ground elevation above 5,000 feet. Table 3-1 lists the national and State of Nevada standards.

Two subsets of PM are inhalable PM_{10} and $PM_{2.5}$. The PM_{10} regulation was established by the Clean Air Act. Sources of PM_{10} within the Project vicinity include:

- stationary point sources, such as fuel combustion and industrial processes
- fugitive sources, such as roadway dust from paved and unpaved roads
- wind erosion from open land
- transportation sources, such as automobiles

Recently, the EPA implemented revised standards for PM. Specifically EPA revised prior standards for PM_{10} and added a new standard for $PM_{2.5}$. The requirement that agencies demonstrate attainment of the new standards has affected the current emission standards for combustion and fugitive dust sources.

O_3 is not emitted directly into the atmosphere from emission sources; it is produced through photochemical (light catalyzed) reactions in the atmosphere involving hydrocarbons and NO_x, known generically as O_3 precursors. Because O_3 formation results from large-scale atmospheric processes, O_3 formation and transport is a regional concern, and not directly associated with individual, localized sources of pollution. In 2008, the EPA promulgated a new O_3 standard, and as of January 2010, is considering changes to making the standard more stringent.

CO is an odorless, invisible gas usually formed as the result of incomplete combustion of organic substances. The primary sources of CO are motor vehicles and stationary combustion sources. Secondary sources include aircraft emissions and agricultural and/or forest burning. CO is more of a localized pollution issue, due to its ability to react in the atmosphere under normal

conditions. However, during those periods when the air is stagnant, such as with a ground-based inversion, local levels of CO can increase. Such inversions are caused when a layer of colder air at higher elevations traps relatively warmer air near the ground, preventing normal air circulation.

SO_2 is formed during the combustion of sulfur-bearing materials, such as the sulfur in metal ores or fossil fuels.

NO_X, consisting primarily of nitric oxide and NO_2, as well as VOCs emissions, readily react in the atmosphere as precursors to O_3 and, to a lesser extent, PM, and are major contributors of acid rain. The NAAQS is specific to NO_2, although total NO_X is usually quantified for emission sources.

Historically, the main sources of Pb emissions are vehicles fueled with leaded gasoline and Pb smelters.

3.1.2 General Conformity Rules

These regulations ensure that federal agencies will not engage, support, or provide financial assistance for licensing or permitting, or approve any activity which does not conform to an approved Clean Air Act implementation plan. Specifically within nonattainment and maintenance areas, potential federal actions (directly or through use authorizations) should not: (1) cause or contribute to new violations; (2) increase the frequency or severity of existing violations; or (3) delay timely attainment or interim emission reductions.

As federal lead agency, the BLM must complete a conformity analysis and possibly a formal determination for the proposed action before it can be approved. The General Conformity Rule excludes activities which are accounted for in the approved SIP, as well as certain specific actions which are assumed to conform. In addition, based on an assessment of reasonably foreseeable potential emissions of the specific air pollutant(s) for which the nonattainment and/or maintenance area was established, activities whose emissions would be below regulatory threshold levels are also assumed to conform. Potential emissions may incorporate BLM enforceable controls or mitigation measures.

Activities which cannot be presumed to conform will require the BLM to prepare a formal General Conformity Determination for public comment, including preparation of a draft Determination, presentation to the public for formal comments, incorporation of changes based on public review, and presentation of the final Determination. If the final Determination cannot demonstrate the activity will comply with applicable requirements of the Clean Air Act, the proposed activity will not be allowed to occur.

Table 3-1 National and State of Nevada Ambient Air Quality Standards

		Nevada Standards[A]		National Standards[B]		
Pollutant	**Averaging Time**	**Concentration[C]**	**Method[D]**	**Primary[C, E]**	**Secondary[C, F]**	**Method[G]**
O_3	1 hour	0.12 ppm (235 μg/m^3)	Ultraviolet absorption	1 hour equals 0.12 ppm (235 μg/m^3) 8 hours equal 0.08 ppm	Same as primary	Chemiluminescence
Ozone Lake Tahoe Basin, #90	1 hour	0.10 ppm (195 μg/m^3)				
CO less than 5,000′ above mean sea level (amsl)	8 hours	9 ppm (10,500 μg/m^3)	Nondispersive infrared photometry	9 ppm (10 mg/m^3)	None	Nondispersive infrared photometry
At or greater than 5,000′ amsl		6 ppm (7,000 μg/m^3)				
CO at any elevation	1 hour	35 ppm (40,500 μg/m^3)		35 ppm (40 mg/m^3)		
NO_2	Annual arithmetic mean	0.053 ppm (100 μg/m^3)	Gas phase chemiluminescence	0.053 ppm (100 μg/m^3)	Same as primary	Gas phase chemiluminescence
SO_2	Annual arithmetic mean	0.030 ppm (80 μg/m^3)	Ultraviolet fluorescence	0.030 ppm	None	Spectrophotometry (Pararosaniline method)
	24 hours	0.14 ppm (365 μg/m^3)		0.14 ppm		
	3 hours	0.5 ppm (1,300 μg/m^3)		None	0.5 ppm	

Table 3-1 National and State of Nevada Ambient Air Quality Standards

		Nevada Standards[A]		National Standards[B]		
Pollutant	**Averaging Time**	**Concentration[C]**	**Method[D]**	**Primary[C, E]**	**Secondary[C, F]**	**Method[G]**
Particulate 50 $\mu g/m^3$ matter as PM_{10}	Annual arithmetic mean	50 $\mu g/m^3$	High-volume PM10 sampling	50 $\mu g/m^3$	Same as primary	High-volume PM_{10} sampling
	24 hours	150 $\mu g/m^3$		150 $\mu g/m^3$		
Pb	Quarterly arithmetic mean	1.5 $\mu g/m^3$	High-volume sampling, acid extraction, and atomic absorption spectrometry	1.5 $\mu g/m^3$	Same as primary	High-volume sampling, acid extraction, and atomic absorption spectrometry
Hydrogen sulfide	1 hour	0.08 ppm (112 $\mu g/m^3$)G	Ultraviolet fluorescence	—	—	—

Notes:

[A] – The director shall use the Nevada standards in considering whether to issue a permit for a stationary source and shall ensure that the stationary source will not cause the Nevada standards to be exceeded in areas where the public has access.

[B] – These standards, other than for O_3, PM, and those based on annual averages, must not be exceeded more than once per year. The 1-hour O_3 standard is attained when the expected number of days per calendar year with a maximum hourly average concentration above the standard is equal to or less than one. The PM_{10} 24-hour standard is attained when there are one or fewer days per calendar year with a 24-hour average concentration above the standard, rounded to the nearest 10 µg/m3. The expected number of days per calendar year is generally based on an average of the number of times the standard has been exceeded per year for the last 3 years. The national standards are to be used in determinations of attainment or nonattainment.

[C] – Where applicable, concentration is expressed first in units in which it was adopted. All measurements of air quality that are expressed as mass per unit volume, such as micrograms per cubic meter, must be corrected to a reference temperature of 25 degrees Centigrade and a reference pressure of 760 millimeters of Hg (1,013.2 millibars); *ppm* in this table refers to parts per million by volume, or micromoles of regulated air pollutant per mole of gas; $\mu g/m^3$ refers to micrograms per cubic meter.

[D] – Any reference method specified in accordance with 40 CFR Part 50 or any reference method or equivalent method designated in accordance with 40 CFR Part 53 may be substituted.

[E] – National primary standards are the levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[F] – National secondary standards are the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a regulated air pollutant.

[G] – The ambient air quality standard for hydrogen sulfide does not include naturally occurring background concentrations.

Source: NDEP 2009

3.1.3 Climate and Meteorology

The region around the Project area has a semiarid climate, with total annual precipitation range of approximately 4 to 10 inches. Mean nighttime and daytime air temperatures typically range from 72°F to 93°F in the summer, and from 34°F to 51°F in the winter. On average, the daily range in temperature change is approximately 18°F. The closest weather-monitoring station to the Project site is located at the Amargosa Valley Library, approximately 0.5 mile from the eastern edge of the Project site. Table 3-2 summarizes daily maximum and minimum temperatures, as well as extreme high and low temperatures by month.

Table 3-2 Climate Temperature Data for Amargosa Valley, Nevada

Month	Air Temperature (°F)			Extremes (°F)		Average Number of Days			
						Maximum Temperature		Minimum Temperature	
	Average Max	Average Min	Average	High	Low	≥90°F	≥75°F	≤32°F	≤20°F
Jan	60.1	33.1	45.6	81	12	0.0	0.7	14.7	1.1
Feb	62.8	36.5	49.2	80	20	0.0	1.9	7.1	0.2
Mar	71.0	42.2	56.8	92	25	0.3	12.4	2.1	0.0
Apr	77.4	47.9	63.4	98	31	2.9	19.0	0.2	0.0
May	89.3	58.2	75.2	108	40	16.6	28.3	0.0	0.0
Jun	98.4	66.5	84.2	110	49	26.8	29.9	0.0	0.0
Jul	104.3	74.1	90.4	114	61	30.9	31.0	0.0	0.0
Aug	101.4	71.7	87.4	112	56	30.3	31.0	0.0	0.0
Sep	93.8	62.3	78.4	107	47	22.4	29.6	0.0	0.0
Oct	81.5	51.4	66.1	99	36	6.4	24.5	0.0	0.0
Nov	69.0	40.2	53.7	87	21	0.0	8.0	4.1	0.0
Dec	59.0	32.2	44.5	75	18	0.0	0.3	16.8	0.5

(Period of Record October 1999 to December 2008)
Source: Community Environmental Monitoring Program 2009

Precipitation in the region is influenced by two distinct storm patterns, one occurring in the winter and the other in the summer. Winter precipitation (dominantly snow in the mountains and rain in the valleys) tends to be low intensity and long duration and covers a great area. In contrast, most summer rains, resulting from local convective thunderstorms, are of high intensity and short duration. These storms can generate an abundance of lightning, strong winds, and

heavy and rapid precipitation. Table 3-3 summarizes precipitation data (rainfall) for the Amargosa area for the period from October 1999 through December 2008.

Local wind patterns have a strong daily cycle of daytime winds from the south and nighttime winds from the north. Figure 3-1 shows the wind patterns near the proposed Project, and illustrates the fluctuations in data from different heights and times of day.

Table 3-3 Precipitation Data for Amargosa Valley, Nevada

Month	Monthly Average	Extremes		Average Number of Days of Precipitation				
		Max 10-minute Precipitation	Max Daily Precipitation	≥ .01 Inch	≥ 0.1 Inch	≥ 0.25 Inch	≥ 0.5 Inch	≥ 1 Inch
Jan	0.48	0.08	0.70	3.1	1.4	0.7	0.2	0.0
Feb	0.97	0.14	1.74	4.9	2.3	1.4	0.3	0.2
Mar	0.29	0.06	0.57	1.8	0.9	0.4	0.2	0.0
Apr	0.19	0.06	0.75	2.1	0.3	0.1	0.1	0.0
May	0.04	0.11	0.32	0.3	0.1	0.1	0.0	0.0
Jun	0.02	0.03	0.05	0.6	0.0	0.1	0.0	0.0
Jul	0.27	0.26	0.85	1.2	0.6	0.3	0.2	0.0
Aug	0.20	0.37	0.64	1.2	0.3	0.3	0.2	0.0
Sep	0.52	0.12	2.37	1.3	0.8	0.4	0.3	0.1
Oct	0.20	0.09	0.40	2.1	0.5	0.3	0.0	0.0
Nov	0.32	0.07	0.89	1.4	0.7	0.4	0.1	0.0
Dec	0.24	0.05	0.63	2.3	0.5	0.3	0.1	0.0
Total	3.74	0.37	2.37	22.4	8.5	4.9	1.9	0.3

Source: Community Environmental Monitoring Program 2009

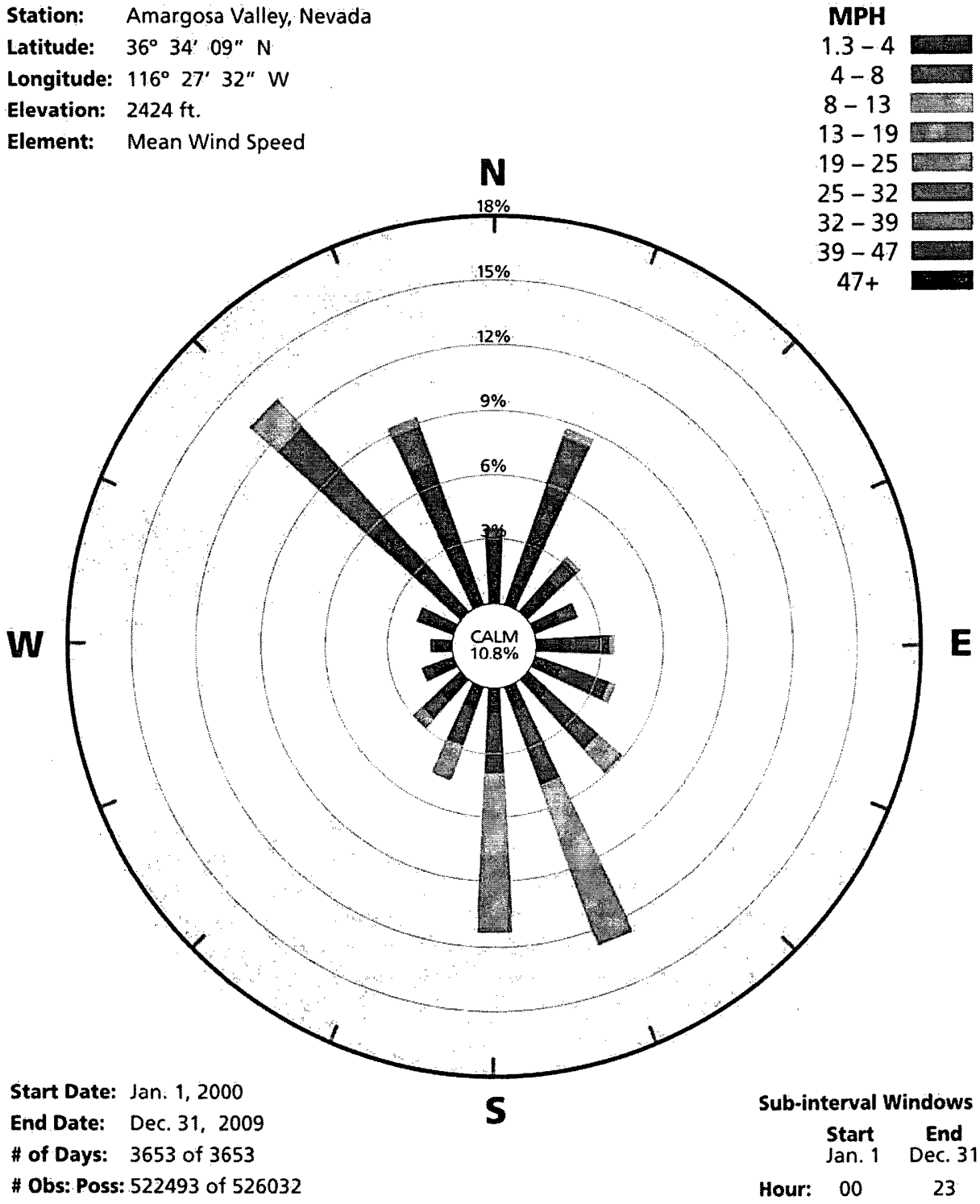


Figure 3-1 Wind Patterns in the Vicinity of the Proposed Project

Table 3-4 summarizes wind speed data for the period from October 1999 through December 2008.

Table 3-4 Wind Speed Data for Amargosa Valley, Nevada

Month	Average	Max Daily Average	Average Daily Peak Gust	Peak Gust	Average Number of Days Peak Gust		
					≥ 30	≥ 40	≥ 50
Jan	4.4	18.8	17.5	43	3.1	0.1	0.0
Feb	5.1	16.6	19.5	42	3.3	0.6	0.0
Mar	5.4	18.1	20.8	42	3.6	0.3	0.0
Apr	7.2	20.4	25.1	58	9.1	1.0	0.1
May	6.5	19.1	23.8	52	5.4	0.7	0.1
Jun	6.9	22.3	24.3	50	5.8	0.8	0.1
Jul	7.1	14.8	25.7	46	7.9	0.3	0.0
Aug	6.8	15.4	24.2	38	5.7	0.0	0.0
Sep	5.6	19.2	21.9	47	4.6	0.4	0.0
Oct	4.8	17.9	18.6	42	2.5	0.2	0.0
Nov	4.0	19.7	16.6	45	1.3	0.2	0.0
Dec	4.0	16.9	16.5	42	2.5	0.2	0.0

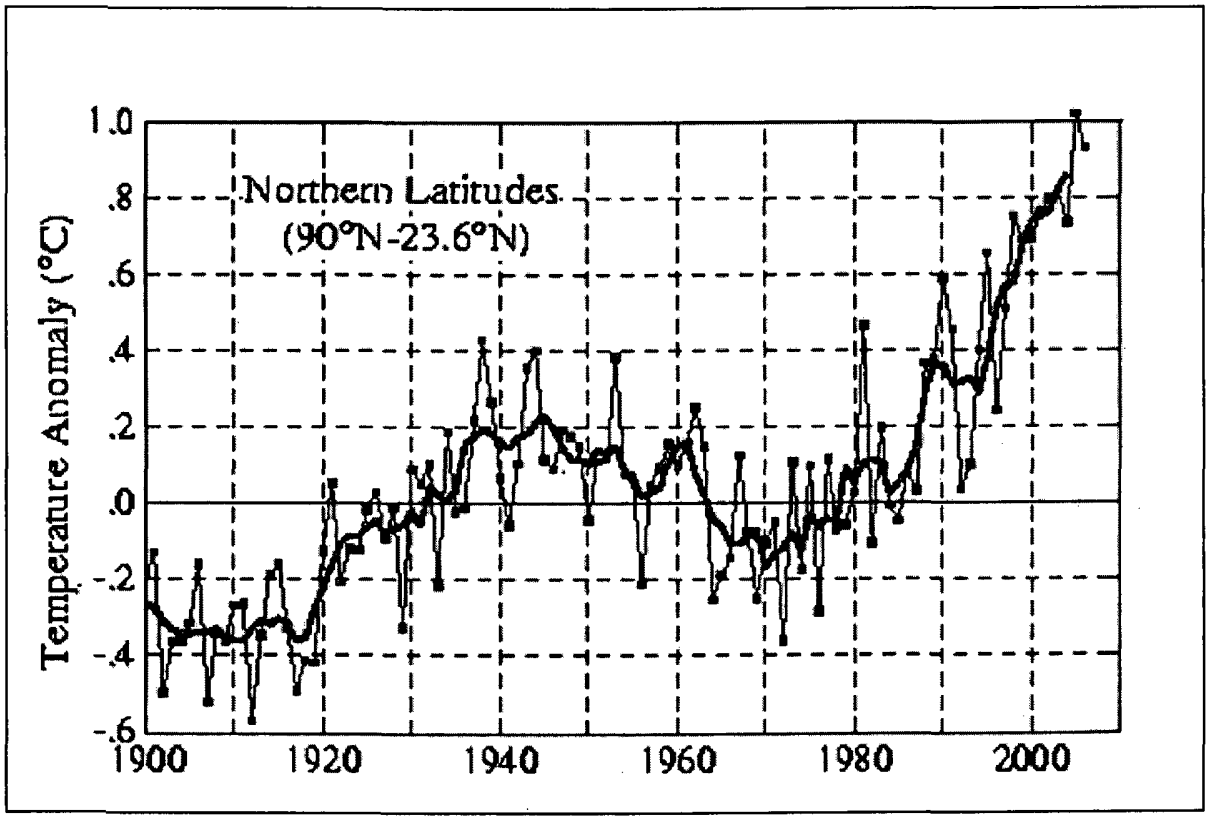
Source: Community Environmental Monitoring Program 2009

3.1.4 Climate Change

Ongoing scientific research into global climate change correlates increasing atmospheric concentrations of greenhouse gases (including carbon dioxide [CO_2], methane, nitrous oxide, water vapor, and several trace compounds) with observed trends of increasing temperatures and changes in the amount and seasonal variability of precipitation. The assessment of greenhouse gas emissions and climate change is in its formative phase, and the net impact to climate cannot yet be determined with an absolute certainty. Predicting regional changes in precipitation due to climate change remains challenging, particularly because of uncertainty in regional projections of how precipitation changes (Intergovernmental Panel on Climate Change [IPCC] 2007). Currently, the BLM does not have operational tools to predict climate change impacts from potential GHG emissions.

Global mean surface temperatures have increased nearly 1.0°C (1.8°F) from 1890 to 2006 (Goddard Institute for Space Studies, 2007). However, observations and predictive models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Figure 3-2 demonstrates that northern latitudes (above 24° N) have exhibited temperature

increases of nearly 1.2°C (2.1°F) since 1900, with nearly a 1.0°C (1.8°F) increase since 1970 alone. Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of greenhouse gases are likely to accelerate the rate of climate change.



Source: Goddard Institute for Space Studies (2007)

Figure 3-2 Annual Mean Temperature Change for Northern Latitudes (24 - 90° N)

3.1.5 Existing Ambient Air Quality

The primary factors that determine air quality of a region are the locations of the air pollution emission sources, amounts and types of pollutants emitted, and local meteorological conditions over a period of time.

An area is considered to be in nonattainment for a pollutant if it has violated the NAAQS (generally, more than one exceedance of the NAAQS annually) for that pollutant. Areas in violation of one or more of these standards are called nonattainment areas. If an area has not been designated as nonattainment, and if there are no representative air quality data, the area is listed as unclassifiable. For regulatory purposes, the EPA considers unclassifiable areas to be in attainment. The Project area is located in an unclassifiable area.

Section 176(c)(1) of the Clean Air Act requires federal agencies to ensure that their actions conform to applicable implementation plans for the achievement and maintenance of the

NAAQS for criteria pollutants. To achieve conformity, a federal action must not contribute to new violations of standards for ambient air quality, increase the frequency or severity of existing violations, or delay timely attainment of standards in the area of concern (e.g., a state or a smaller air quality region). The EPA general conformity regulations (40 CFR 93, Subpart B) contain guidance for determination of whether a proposed federal action would cause emissions to be above certain levels in locations designated as nonattainment or maintenance areas. By definition, a *maintenance area* is a region that was previously in nonattainment, but the EPA or state has re-designated it as an attainment area, with a requirement to develop a maintenance plan.

The Prevention of Significant Deterioration (PSD) program of the Clean Air Act controls air quality in attainment areas; its goal is to prevent significant deterioration of existing air quality. This program is applicable only to point sources and does not apply to transportation sources. Under the PSD provisions, Congress established a land classification scheme for areas of the country with air quality better than the NAAQS. Under this scheme, Class I allows very little deterioration of air quality, Class II allows moderate deterioration, and Class III allows more deterioration; but within each classification, the pollution concentrations must not violate any NAAQS.

On August 7, 1977, Congress designated 158 areas in existence as Class I, including national parks larger than 6,000 acres and wilderness areas larger than 5,000 acres. Class II areas are essentially all areas that are not designated Class I by Congress. Class II areas could include rural and urban areas, lands managed by cities or state agencies, and land managed by the federal government that have not been designated as Class I. Death Valley National Park is a Class II designation area. The nearest boundary of Death Valley National Park is approximately 4 miles southwest of the Project area.

Due to the remoteness of the Project area, there are limited air quality data specific to Amargosa Valley. However, air quality data are available for the Yucca Mountain area north of the Project site, and for the Pahrump Regional Planning District approximately 30 miles southeast of the Project site. The dominant air pollutant in the regional area is PM. Although construction and excavation activities tend to aggravate dust production in the area; however, natural sources of particlate matter, especially dust accumulating in dry playas, tend to be the dominant source.

While the air quality in most of Nye County is unclassifiable, a portion of the Pahrump Valley is in nonattainment for PM_{10}. Nye County and Pahrump, in cooperation with NDEP, successfully negotiated with the EPA to enter into a Memorandum of Understanding to address the nonattainment classification in Pahrump Valley. The Memorandum requires the parties to prepare a Clean Air Action Plan for the nonattainment portion where rapid growth and development have affected air quality with increased fugitive dust levels for Pahrump Valley. As required by the Memorandum, Nye County has enacted an ordinance to regulate construction and other ground-disturbing activities, and has implemented a mandatory program of Best Practicable Methods for use on all ground disturbances of 0.5 acre or greater (NDEP 2009). This Memorandum of Understanding refers to Pahrump Valley only it does not include Amargosa Valley where the proposed Project site is located.

3.1.6 Existing Emission Sources

There are three primary emission sectors in Nevada: (1) electrical generation; (2) transportation; and (3) residential, commercial, and industrial fuel use. The smaller emission sectors are industrial processes, agriculture, waste management, fossil fuel industry, and forestry. The NDEP – BAPC has jurisdiction over air quality programs in all counties in the state, with the exception of Clark and Washoe counties. The BAPC has jurisdiction only over fossil-fuel-fired units that generate steam for electrical production in these counties.

NRS 445B.380 requires that a statewide greenhouse gas emissions inventory be prepared and issued by the NDEP, at least every four years beginning in 2008. The emissions inventory must include the origins, types and amounts of greenhouse gases released throughout the State, as well as all supporting analyses and documentation.

On October 30, 2009, the EPA promulgated Title 40 part 98 – Final Mandatory Reporting of Greenhouse Gases Rule (Federal Register: Volume 74, Number 209; Page 56259-56519). In general, the rule covers sources emitting any of the major greenhouse gases (CO_2, methane, nitrous oxide, hydroflourocarbons, perfluorocarbons, sulphur hexafluoride, and other fluorinated gases, including nitrogen trifluoride and hydrofluorinated ethers) in an amount equal to or greater than 25,000 metric tons of greenhouse gas emissions or its equivalent per year. This rule requires that facilities classified as general stationary fuel combustion sources, including electricity generating services (North American Industry Classification System [NAICS] Code 221) report emissions if annual rates equal or exceed 25,000 ton of greenhouse gas. However, the rule does not set specific reporting requirements for electric power generation from solar resources (NAICS code 221110).

The BAPC issues four types of operating permits – Class I, Class II, Class III, and Surface Area Disturbance (SAD). Class I sources are sources that have a potential to emit more than 100 tons of PM_{10}, SO_2, NO_X, CO, or VOCs; Class II sources are sources that have the potential to emit less than 100 tons of PM_{10}, SO_2, NO_X, CO, or VOCs. Class III sources are sources that cannot emit more than 5 tons/year of combined PM_{10}, SO_2, NO_X, and VOCs and may not be subject to federal standards (40 CFR 60, 61, 63), excluding 40 CFR 60 Subpart IIII and JJJJ (Phillip, personal communication, 2009).

SAD sources are Class II sources that only have a surface-area disturbance associated with the site/facility. Surface-area disturbance permits are required if the Project will disturb 5 or more acres of land (Phillip, personal communication, 2009).

There are no PSD sources or Class I sources in the ROI (Amargosa Desert Hydrographic Basin #230). There are several Class II and III sources in Basin 230. These are listed in Table 3-5.

Table 3-5 Class II and Class III Sources in the Amargosa Valley

Facility ID	Permit ID	Class	Company Name	Facility Name
A0519	AP32712457	II	Cind-R-Lite Cinder Cone Mine	Class II – Cinder Cone Mine
A0447	AP14592231	II	Mud Camp Mining Company, LLC	Class II – dba Industrial Mineral Ventures (IMV) Nevada
A0786	AP48122278	II	Alltel Communications, Inc.	Class II – Mt. Schader Cell Site
A0966	AP10412492	II	CR Reward Corporation	Class II – Reward Mine
A0448	AP14592455	II	R.T. Vanderbilt Co., Inc.	Class II – Vanderbilt Minerals
A0467	AP14990924.02	II	Ash Meadows, LLC	Class II – Ash Meadows Project
A0557	AP49530184.02	II	U.S. Ecology Nevada, Inc	Class II – Hazardous Waste Stabilization Unit
A0106	AP14421368	III	Have Welder Will Travel	Class III
A0483	AP16112479	III	Funeral Mountain Ranch	Class III
A1025	AP48122565	III	Alltel Communications, LLC	Class III – Amargosa Valley Cell Site
A0936	AP16292454	II	Death Valley Raceway	SAD – Death Valley Raceway
A0641	AP16292090	II	Tri-state Contracting	SAD – E Street Apartments, LLC
A0771	AP14592261	II	Mud Camp Mining Co., LLC – IMV Nevada	SAD – Ewing Bentonite Mining Area
A0191	AP10412304	II	Barrick Bullfrog, Inc.	SAD – Final Closure of Tailings Pond 3/4
A0229	AP14421142.01	II	Nye County Road Department	SAD – Free Use Gravel Pit
A0801	AP16292295	II	TSS Investments, LLC	SAD – Kozal Subdivision
A0449	AP16292435	II	Galtar, LLC	SAD – Lathrop Mill
A1005	AP14422540	II	Frehner Construction Company	SAD – Mercury Highway Project
A0772	AP14592262	II	Mud Camp Mining Co., LLC – dba IMV Nevada	SAD – Moretti Mining Area
A0773	AP10412263	II	Sterling Gold Mining Corporation	SAD – Sterling Mine
A0674	AP16292123	II	Clay Management Trust	SAD – T&T Parcels Project
A0770	AP14592260	II	Mud Camp Mining Co., LLC – dba IMV Nevada	SAD – West Dry Lake Mining Area
A0816	AP16292311	II	William Hernstadt	SAD – Zoe Village Estates

Source: Phillip, personal communication, 2009

3.2 GEOLOGICAL HAZARDS AND MINERAL RESOURCES

This section presents an overview of the regional and local geology, geological hazards, and mineral resources that occur within the Project area and ROI. The main purpose of this analysis is to identify geological hazards that could result in potential risks to Project construction or operation, and any locatable, leasable, and salable mineral deposits that may be impacted by the Project. Geological hazards include active faulting, seismicity, and ground subsidence. The Project area is located in the Amargosa Valley, Nye County, Nevada, within the Leeland, and South of Amargosa Valley, U.S. Geological Survey (USGS) 7.5-minute quadrangle topographic maps.

3.2.1 Regulatory Framework

3.2.1.1 Federal

NEPA and FLPMA serve as the primary federal legislation requiring assessment and mitigation of potential impacts to geological resources on federally administered land. The General Mining Law of 1872, Mineral Leasing Act of 1920, and Mineral Materials Act of 1947 specifically govern the discovery, disposition, and extraction of mineral resources throughout the western United States.

The General Mining Law of 1872 (30 USC §§ 22, 28, 28b) was the first formal, large-scale demarcation of mining claim law in the United States. In general, the law allows United States citizens to locate lode or placer mining claims on federal land that has been opened to mineral entry. Lode claims are located within rock formations or veins of ore, whereas placer deposits are deposits of minerals that have been washed by water into alluvial deposits. The Mineral Leasing Act of 1920 (30 USC §§ 181-187, 187a-b, 188-195, among others.) separated the governance of coal, petroleum, natural gas, and other hydrocarbons away from the jurisdiction of the General Mining Law, and provided regulation and guidance for their leasing on public lands. The Mineral Materials Act of 1947 (30 USC §§ 601-604) regulates the sale and disposal of mineral material resources from public land, including common varieties of sand, gravel, stone, pumice, pumicite, cinders, clay, other minerals, and petrified wood. Many of the mineral resources governed by this law are most often used for construction or industrial purposes.

The majority of the Project area is located on BLM-administered land. As such, an approved right-of-way is required for the Project and all of the previously listed federal laws regarding geological resources must be adhered to throughout the construction and operation of the proposed Project.

3.2.1.2 State

The establishment of claims on locatable mineral resources, such as lode and placer mines, is governed by the NRS §§ 517.003-517.460. Leasable mineral resources such as oil and gas deposits on state land in Nevada are governed by NRS §§ 522.010-522.190.

3.2.1.3 Local

No local regulations governing geological resources are known to apply to the construction and operation of the proposed Project.

3.2.2 Data Collection Methods

The geological inventory for the proposed Project presents an overview of the regional geology and the specific geological features that occur within the Project area and ROI. The Project area refers to the area that encompasses the proposed right-of-way and associated components. The ROI includes the Project area, as well as the Amargosa Valley Planning Area. Information for the inventory was obtained from the scientific literature (publications and maps) and discussions with agency specialists at the USGS, BLM, and Nevada Bureau of Mines and Geology (NBMG).

Locality information pertaining to geological formations, local seismicity, recent earthquakes, and known areas of Quaternary faulting was compiled into a geographic information system (GIS). The geological formations within the Project area were identified from a geological map of the Nevada Test Site region (Slate et al. 1999). Landslide and fault data were compiled from the USGS Atlas (USGS 2009). Earthquake data between 1973 and the present were acquired from the National Earthquake Information Center (USGS 2009). Seismicity data were obtained from the Geological Hazards Team at the USGS Earthquake Hazard Program (Peterson et al. 2008; USGS 2009).

The mineral resource inventory presents an overview of the locatable, leasable, and salable resources present in the Project area and ROI. Locatable resources are typically metallic mineral deposits such as copper and gold. Leasable resources include energy resources such as petroleum, natural gas, and coal. Salable resources include sand and gravel. Information for the inventory was obtained primarily from the Geocommunicator online database that is operated by the BLM and U.S. Forest Service (USFS [2009]). Additional information was obtained from publications and maps of the USGS, BLM, and NBMG. Mineral resource data were compiled into the GIS.

3.2.3 Regional Geological Setting

The Project area is located within the Amargosa Valley in southern Nevada, which is located in the southwestern part of the Basin and Range physiographic province (Fenneman 1931). The Basin and Range physiographic province is characterized by north-south trending mountain ranges that are separated by alluvium-filled, nearly flat to gently sloping valleys. The mountain ranges consist mostly of Paleozoic quartzite, limestone, dolomite, sandstone, siltstone, shale, and chert. Also present in the mountain ranges are Mesozoic limestone, siltstone, conglomerate, granodiorite, and monzonite. The valleys contain Cenozoic, tuffaceous, sedimentary rocks, as well as alluvial, fluvial, playa, lacustrine, and spring deposits (Stewart 1980). The Basin and Range Province formed through regional, crustal extension of the western part of the North American continental plate, with fault blocks sliding downward, forming basins that are separated by ranges (Eaton 1982).

The southeastern portion of Amargosa Valley is bounded by the Amargosa and Funeral Mountain ranges to the southwest; the Ash Meadows area, Specter Range, and Little Skull Mountain to the east; and Yucca Mountain and the Calico Hills to the north. The Amargosa River flows mostly north to south and is underground through the western side of Amargosa Valley. Fortymile Wash is a tributary of the Amargosa River that originates on the Nevada Test Site to the north of the Project area as Fortymile Canyon, before flowing toward the south and becoming Fortymile Wash (Stonestrom et al. 2003). Fortymile Canyon lies between Yucca Mountain and the Calico Hills. Fortymile Wash flows in a southwesterly direction through the Project area before joining the Amargosa River. Fortymile Canyon and Fortymile Wash drain highland areas that are mostly comprised of igneous rocks of Tertiary age. For instance, Yucca Mountain is largely composed of Tiva Canyon Tuff that erupted from the Claim Canyon caldera; whereas, the Calico Hills are composed of the Calico Hills Rhyolite (Slate et al. 1999). Elevation near the Project area is from 2,600 feet above sea level at the floor of Amargosa Valley to over 6,500 feet above sea level at Yucca Mountain.

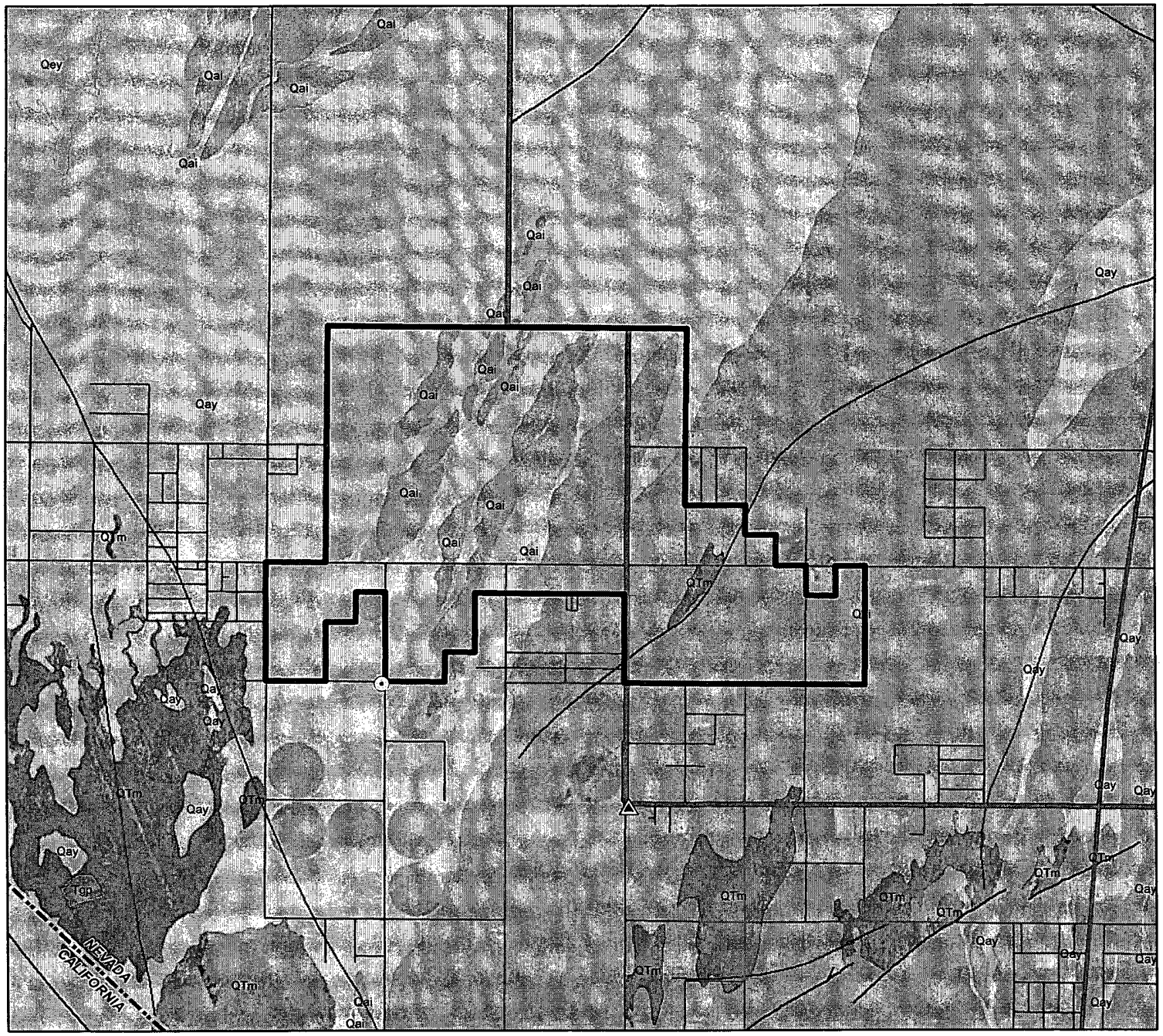
3.2.4 Geological Units in the Project Area

The Project area contains mostly alluvial-fan deposits, which are the most common geological units within the Amargosa Valley (Figure 3-3). Two Quaternary alluvial deposits and one Quaternary-Tertiary spring deposit are mapped within the Project area (Slate et al. 1999). These mapped geological units are named, respectively: (1) Young alluvial deposits (Qay); (2) intermediate alluvial deposits (Qai); and (3) Quaternary-Tertiary marl deposits (QTm). The alluvial units share a likely source in the mountains and hills to the north of US 95. The Quaternary-Tertiary marl deposits were emplaced by ancient springs and seeps that were present in the Amargosa Valley.

The hydrogeologic units described by Sweetkind et al. (2004) can be correlated with these geological units. Younger and Older Alluvial Aquifers described by Sweetland et al. (2004) are correlated with the Young alluvial deposits and intermediate alluvial deposits, respectively; and the Limestone Aquifer is correlated with the marl deposits. The hydrogeologic units described by Winograd and Thordarson (1975) are not correlated with these geological units. The Valley-fill aquifer that they described is present, on average, between 650 and 960 feet deep. The Lower Carbonate aquifer as described by Winograd and Thordarson (1975) is present, on average, between 1,370 and 1,800 feet deep. Devils Hole in the Ash Meadows area is a water-filled cave system in the Paleozoic carbonates of the Bonanza King Formation. This suggests that the surface water in the Ash Meadows area is linked to the Lower Carbonate Aquifer as described by Winograd and Thordarson (1975).

3.2.4.1 Young Alluvial Deposits

Quaternary to recent alluvium is mapped as a long, southwestern-oriented lobe overlying another broader and older alluvial fan composed of older Quaternary alluvial material (see Figure 3-3). Young alluvial deposits comprises poorly sorted silt, sand, gravel, and cobbles, with a typical total thickness of less than 2 meters (Slate et al. 1999).



Amargosa Farm Road Solar Energy Project (NVN-84359)

Geologic Resources Figure 3-3

LEGEND

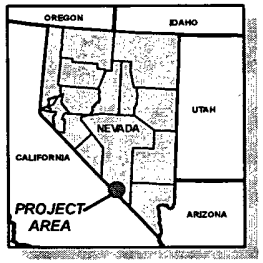
Project Area

Geology

- Intermediate Alluvial Deposit (Qai)
- Marl Deposit (QTm)
- Young Alluvial Deposit (Qay)
- Young Eolian Sand Deposit (Qey)
- Pre-Basin-Range Sedimentary Rock (Tgp)
- Geologic Structure
- Fault

General Reference Features

- Existing Transmission Line (<230kV)
- Existing Substation
- Proposed Project Well
- Highway
- Local Road
- State Boundary



Source: Geology - USGS, 1999;
Transmission Lines, Substations - Platts, 2009;
Wells - Nevada State Engineer, 2008;
Roads - TerraSpectra Geomatics 2009;
Imagery - ESRI, 2009

September 2010

0 0.75 1.5 Miles

These deposits are Holocene to Recent in age (10,000 years old to present) and exhibit little to no development of desert pavement. Surface clasts are unvarnished. Young alluvial deposits are present in the western half of the Project area.

3.2.4.2 Intermediate Alluvial Deposits

Intermediate alluvial deposits are mapped alongside the Young alluvial deposits as the principal component of a large alluvial fan that covers most of the eastern end of Amargosa Valley (Slate et al. 1999). Intermediate alluvial deposits consist of silt, sand, gravel, and cobbles. Surface clasts are old enough (Holocene to late Pleistocene in age) to have acquired some desert varnish.

3.2.4.3 Quaternary-Tertiary Marl Deposits

Marl deposits of Quaternary-Tertiary age are the only non-alluvial geological units mapped within the Project area (see Figure 3-3). These spring deposits consist of massive to well-bedded mudstone and marlstone that commonly contain fossil root casts of plants (Slate et al. 1999).

3.2.5 Unique Geological Resources

Unique geological resources that may have recreational interest to the general public include dunes, natural bridges, caves, waterfalls, and rock or mineral collecting areas. Based on a search of recreation-related websites (e.g., Nevada Division of State Parks), there are no known recreational or unique geological resources associated with the Project area.

The nearest geological resource of recreational interest is the Big Dune complex located in Amargosa Valley, approximately 4 miles northwest of the Project area. The Big Dune complex is protected as a BLM-designated ACEC. The dune is composed of Quaternary eolian dune sand derived from Precambrian source rocks, likely the Funeral Mountains southwest of the dune field (Castor et al. 2006; Slate et al. 1999). The Big Dune exhibits the characteristic multi-lobed morphology of a large, pyramidal star dune. Star dunes are frequently stable, only shifting within a localized area, often remaining fixed in place for centuries (Bates and Jackson 1987).

3.2.6 Geological Hazards

Geological hazards include earthquakes, faults, seismicity, and ground subsidence. Earthquake data have been compiled by the USGS National Earthquake Information Center since 1973 (USGS 2009). The USGS maintains archives of all earthquakes of detectable magnitude and have made this earthquake catalog available to the public. No earthquakes have been recorded within the Project area, although nine earthquakes have been recorded within 10 miles of the Project area, ranging from 2.9 to 4.1 magnitudes on the Richter scale (Figure 3-4). The most recent earthquake occurred in 2004, in the Funeral Mountains southwest of the Project area.

Faults have been mapped in the eastern portion of the Project area, as well as outside the Project area to the west (Figure 3-4). These faults were inferred from gravity anomalies in the Amargosa

Valley. Quaternary to Recent faults have also been mapped southeast of the Project area, and are the likely source of spring deposits and Quaternary marls, as the faults provide a path for groundwater to reach the surface (dePolo 2008; Slate et al. 1999).

Seismicity is a measure of the susceptibility of an area to damaging earthquakes and is measured in terms of acceleration due to gravity (Peterson et al. 2008). Seismicity data and maps are available from the Geological Hazards Team, a unit of the USGS Earthquake Hazard Program (USGS 2009). The region around the Project area is mapped as having 10 to 15 percent gravity (Figure 3-4). According to the USGS, 10 percent gravity is the lower threshold at which damage to structures is likely to occur, dependent upon measures taken in design and construction to mitigate structural damage as a result of ground shaking.

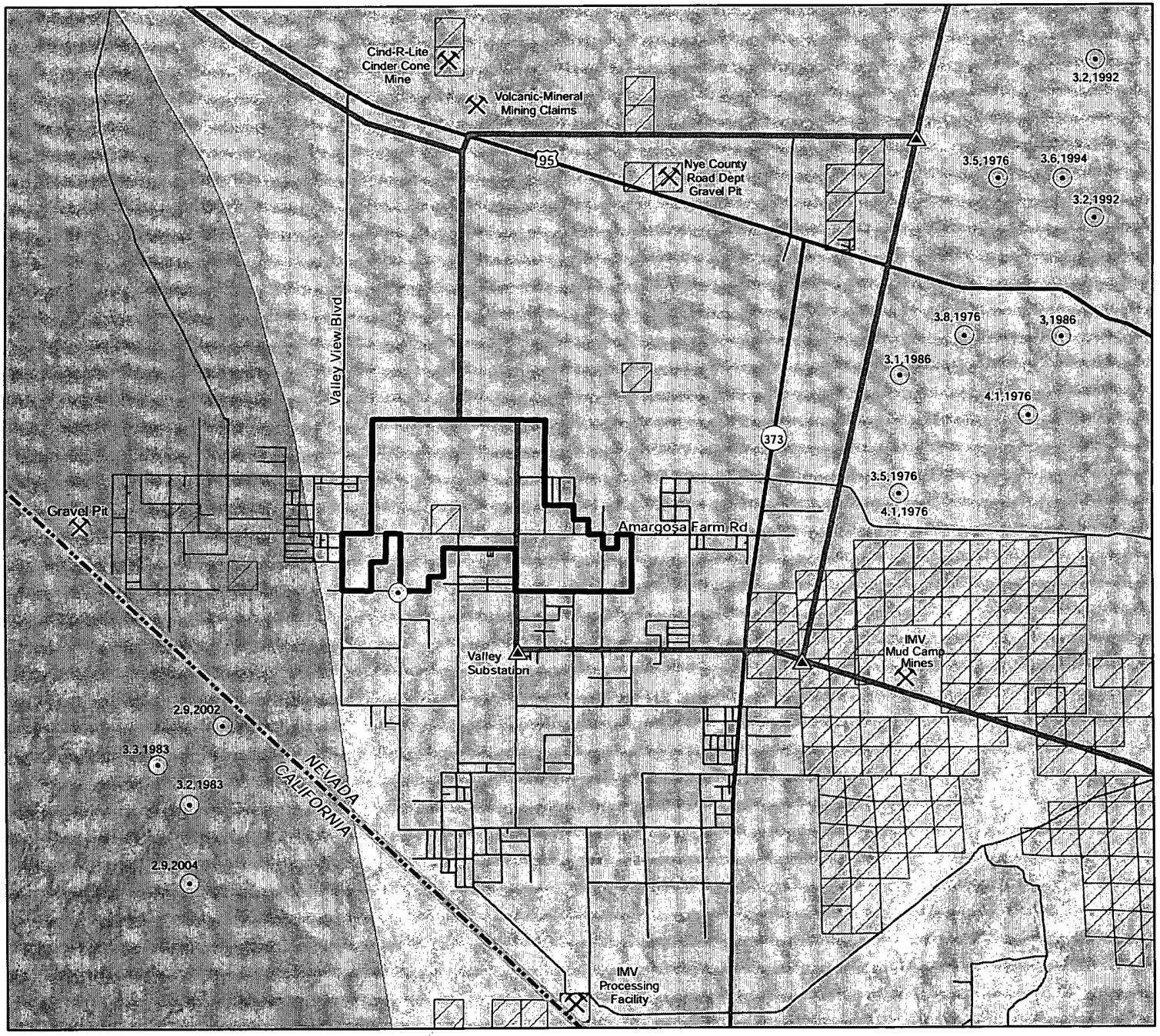
Ground subsidence is the relative downward motion of the local land surface that is often the result of subsurface mining, drawdown of groundwater for irrigation, or settling of soils resulting from local usage of high explosives for mining or construction. Within the Project area, groundwater drawdown is the most likely cause for ground subsidence. A minor amount of subsidence has been mapped using satellite interferometry within Amargosa Valley, which is attributed to groundwater usage (Katzenstein and Bell 2005).

3.2.7 Mineral Resources

An inventory of mineral resources was conducted in and around the Project area to determine if known mineral resources are present, or if there is a possibility of discovering mineral resources in the future. The inventory included locatable, leasable, and salable mineral resources and was conducted using information from the USGS, BLM, and NBMG.

Active mining claims and mineral-materials areas are mapped by the Geocommunicator online mapping system maintained by the BLM and USFS. There are four active mineral-resource-extraction areas in Amargosa Valley within 5 miles of the Project area (see Figure 3-4). The first area has active mining claims staked by Mud Camp Mining, LLC, which are present to the southeast of the Project area in sections 20, 21, and 29 of T16S R50E. The Mud Camp Mining claims provide specialty clays (sepiolite and saponite) to a processing facility operated by IMV Nevada, located in section 29 of T17S R49E to the south of the Project area. The second area, in section 10 of T15S R49E, is a sand and gravel site used by Nye County under a Free Use Permit. The third area contains an active sand and gravel operation at the western end of Amargosa Farm Road, approximately 5 miles from the Project area. The fourth area has a series of public and private claims for volcanic-mineral materials, such as pumice and cinder, which are located north of the Project area at the junction points of T14S R48E, T14S R49E, T15S R48E, and T15S R49E.

This final group of claims includes the Cinder Cone Mine operated by the Cind-R-Lite Block Company, located in section 36 of T14S R48E. None of these four active mineral-resource-extraction areas is located in the Project area. Potential mineral resources located within the Project area are described in the following section.



Amargosa Farm Road Solar Energy Project (NVN-84359)

Geologic Hazards and Mineral Resources Figure 3-4

LEGEND

Project Area

Geologic Hazards

Peak Horizontal Acceleration (%g)
(g = acceleration due to gravity)

10-15

15-20

Earthquakes (magnitude, year)

Mining Claims

Active Mining Claim / Processing Facility

Closed Placer Claim

General Reference Features

Existing Transmission Line (<230kV)

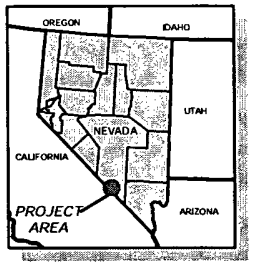
Existing Substation

Proposed Project Well

Highway

Local Road

State Boundary



Source: Earthquakes, Seismicity - USGS, 2009; Mining Claims - BLM, 2009; Imagery - ESRI, 2009; Transmission Lines, Substations - Platts, 2009; Roads - TerraSpectra Geomatics 2009; Wells - Nevada State Engineer, 2008

September 2010

0 1 2 Miles

3.2.7.1 Locatable Mineral Resources

There are no active claims in the Project area (BLM and USFS 2009).

3.2.7.2 Leasable Mineral Resources

No leases for leasable mineral resources (oil, gas, and coal resources) are recorded within the Project area (Garside and Hess 2007; Hess et al. 2004; BLM and USFS 2009).

3.2.7.3 Salable Mineral Resources

No mineral-material contracts for salable mineral resources (sand, gravel, topsoil, and clay) are recorded within the Project area (BLM and USFS 2009).

3.3 SOILS

3.3.1 Data Collection Methods

The soil inventory presents an overview of soil types and characteristics, including areas of potential wind and/or water erosion in the Project area. Information for the inventory was obtained primarily from publications, unpublished reports, data of the Soil Conservation Service and the BLM, and from discussions with specialists. The soils inventory was compiled from data maintained online as part of the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey, namely the USDA soil survey report that includes the Project area and ROI.

3.3.2 Soils in the Project Area

Four soil map units (three associations and one series) have been mapped within the Project area (Figure 3-5): (1) the Yermo, hot-Yermo-Arizo association; (2) Lewdlac-Yermo association; (3) Sanwell-Sanwell, warm-Yermo association; and (4) Shamock series (Borup 2004).

A soil association is a map unit used in soil surveys to represent areas that contain two or more distinct soil series in such a pattern that it is easy to illustrate them as a single map unit for mapping purposes. A soils series is an individual map unit, much like a geological formation that represents an area that has unique characteristics. The four soil map units mapped within the Project area are listed in Table 3-6.

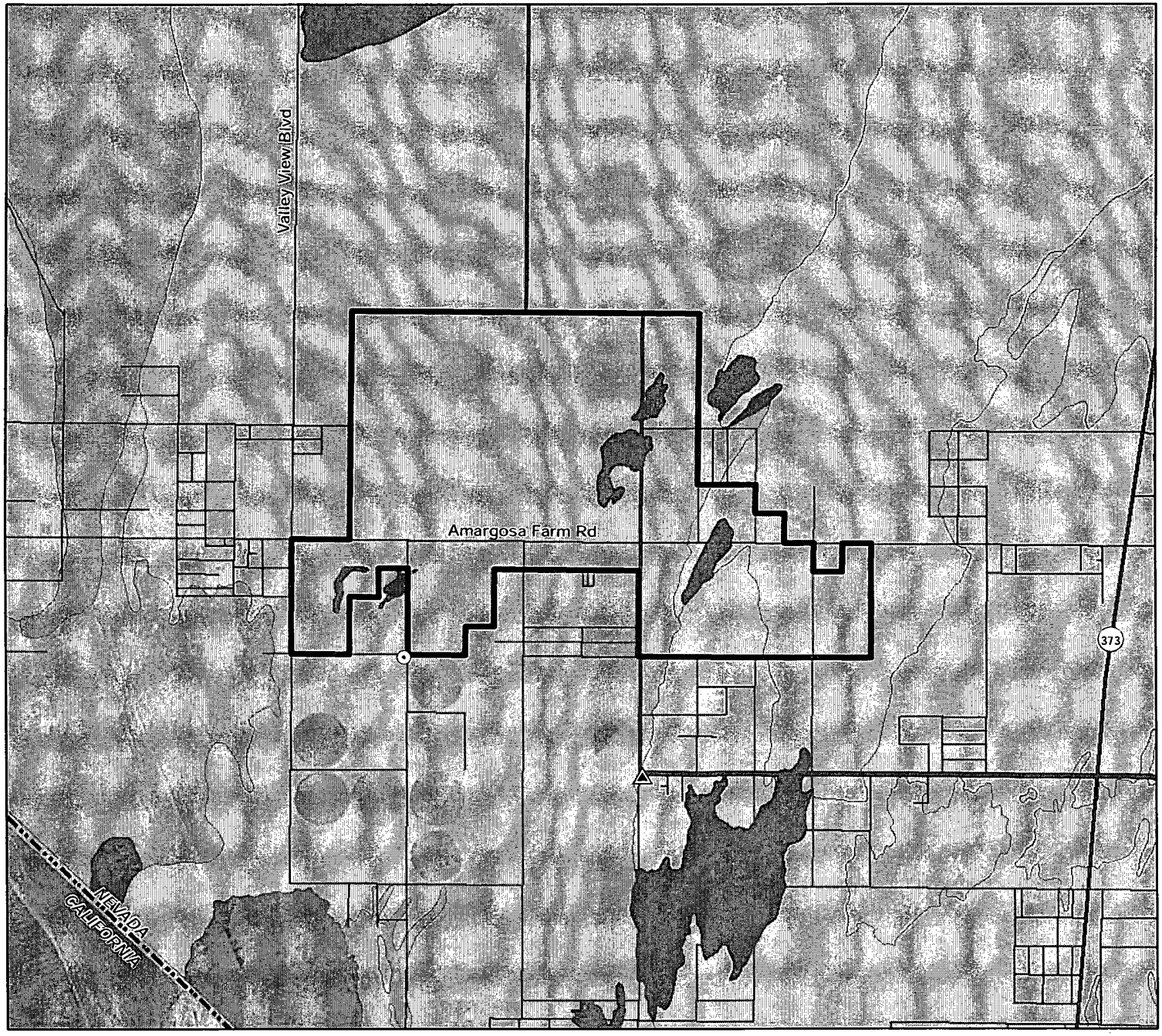
3.3.2.1 Yermo, hot-Yermo-Arizo Association

The Yermo, hot-Yermo-Arizo association mostly comprises 40 percent hot-Yermo soil, 30 percent Yermo soil, and 15 percent Arizo soil on slopes of 2 to 4 percent. This soil association is the most common, covering more than two-thirds of the Project area.

Table 3-6 Soil Map Units and Properties within Project Area

Map Unit		Yermo, hot-Yermo-Arizo association	Shamock series	Sanwell-Sanwell, warm-Yermo association	Lewdlac-Yermo association
Texture		Skeletal, mixed, thermic, Typic Torriorthents	Coarse-loamy, mixed, thermic, Typic Haplodurids	Skeletal, mixed, thermic Duric Torriorthents	Loamy, mixed, thermic, Cambidic Haplodurids
Permeability		Moderately rapid to very rapid	Moderate	Moderate to moderately rapid	Moderately rapid
pH		8.5	8.5	8.2	8.2
Water Capacity		Low	Low	Low	Very low
Hydrologic Group		B	C	B	D
Water Erosion	**Kw**	0.1	0.2	0.2	0.2
	Kf	0.2	0.3	0.4	0.3
	T	5	2	5	2
Wind Erosion	**WEG**	5	4	4	3
	WEI	56	86	86	86
Landscape Position (percentage slope)		2 to 4	2 to 4	0 to 4	2 to 4
Depth to Bedrock/ Restrictive Feature (inches)		>80	25 to 40 to duripan	>80	10 to 20 to duripan
Land Capability (Irrigated, Nonirrigated)		4	4	–	7
Topsoil Reclamation		Poor	Poor	Poor	Fair

Key:
Kw = susceptibility of the whole soil to sheet and rill water erosion
Kf = susceptibility of only the soil's fine portion (<2 millimeters in diameter) to these same forms of water erosion
(Generally, soils that are more susceptible to water erosion will exhibit greater Kw and Kf factors.)
WEG = wind erodibility group; soils assigned lower ratings are more susceptible to erosion
WEI = wind erodibility index



Amargosa Farm Road Solar Energy Project (NVN-84359)

Soils
Figure 3-5

LEGEND

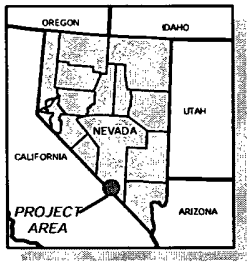
Project Area

SSURGO Soils

- Rock outcrop-Upspring-Rubble land
- Corbilt gravelly fine sandy loam, warm
- Yermo, hot-Yermo-Arizo association
- Vace gravelly sandy loam
- Shamock gravelly fine sandy loam
- Arizo-Bluepoint-Dune land complex
- Arizo very gravelly sandy loam, moist
- Arizo-Corbilt-Commski association
- Sanwell-Sanwell, warm-Yermo association
- Nowoy-Skelon association
- Lewdlac-Yermo association

General Reference Features

- Existing Transmission Line (<230kV)
- Existing Substation
- Proposed Project Well
- Highway
- Local Road
- State Boundary



Source: Soils - NRCS, 2006; Imagery - ESRI, 2009; Transmission Lines, Substations - Platts, 2009; Wells - Nevada State Engineer, 2008; Roads - TerraSpectra Geomatics 2009

September 2010

0 0.8 1.6 Miles

The Yermo, hot-Yermo-Arizo association has a low water capacity, with moderately rapid to very rapid permeability, and is assigned to hydrologic group B, which corresponds to a moderate water-infiltration route in soils with fine to moderately coarse texture. The soil association has a measured pH of 8.5. Bedrock is not encountered at 80 inches of depth and is likely much deeper. This map unit has been rated as a poor candidate to provide suitable topsoil for reclamation efforts (Borup 2004).

The soils of the Yermo series are typically deep and well drained, occurring on alluvial fans with alluvium derived from mixed rocks. Typically, Yermo series soils are characterized as loamy-skeletal, mixed, superactive, calcareous, thermic, Typic Torriorthents (Borup 2004). The taxonomic classification, Typic Torriorthents, is given to those soil units that exemplify the torriorthents, a soil order that is defined by little to no development of any true soil horizons and that are formed in warm, arid environments (USDA – NRCS 1993). This soil order and its variations are some of the most common soils throughout the Southwest (Birkeland 1999). Within this soil association, the Yermo series is divided into two separate soil units, the Yermo and the hot-Yermo. This division reflects varying average temperatures recorded within the Yermo series, possibly due to greater gravel content or slope facing.

The soils of the Arizo series are typically deep and excessively drained, occurring on inset fans with slopes between 0 and 15 percent. Arizo series soils form in alluvium that is derived from mixed rocks (e.g., igneous, carbonate). Taxonomically, Arizo series soils are characterized as sandy-skeletal, mixed, thermic, Typic Torriorthents (Borup 2004).

3.3.2.2 Lewdlac-Yermo Association

The Lewdlac-Yermo association is intermittently present in the Project area, specifically in the southwestern, southeastern, and northeastern corners of the Project area. The Lewdlac-Yermo association consists of 70 percent Lewdlac series soils and 15 percent Yermo series soils on slopes of 2 to 4 percent. The Lewdlac-Yermo association exhibits very low water capacity with moderately rapid permeability and is assigned to hydrologic group D, which corresponds to a very slow water-infiltration rate. This is likely because of a duripan layer between 10 and 20 inches below the surface that impedes the transmission of water. This soil association has a measured pH of 8.2. Bedrock is not encountered at 80 inches and is likely much deeper. The Lewdlac-Yermo association has been given a fair rating regarding its suitability to provide topsoil for reclamation efforts (Borup 2004).

The soils of the Lewdlac series are typically shallow, over a strongly cemented duripan. These well-drained soils occur on alluvial flats with slopes ranging from 2 to 8 percent. Lewdlac series soils form in alluvium mostly derived from quartzite over reworked lacustrine sediments. Typically, Lewdlac series soils are characterized as loamy, mixed, superactive, thermic, shallow, Cambidic Haplodurids. The soil taxonomic classification, Cambidic Haplodurids, includes aridisols that contain a duripan within the upper 40 inches of the soil unit that is strongly cemented (Borup 2004).

Yermo series soils mapped within this soil association exhibit the same characteristics as those mapped as part of the Yermo, hot-Yermo-Arizo association.

3.3.2.3 Sanwell-Sanwell, warm-Yermo Association

The Sanwell-Sanwell, warm-Yermo association is restricted to the southeastern portion of the Project area. It consists of 65 percent Sanwell series soils and 20 percent Yermo series soils on slopes of 0 to 4 percent. This soil association exhibits low water capacity with moderately rapid permeability and is assigned to hydrologic group B, which corresponds to a moderate water-infiltration route in soils with fine to moderately coarse texture. The Sanwell-Sanwell, warm-Yermo association has a measured pH of 8.2. This soil association has been assigned a poor rating regarding its suitability for use as topsoil for reclamation efforts (Borup 2004).

The soils of the Sanwell series are typically very deep and well drained, occurring on alluvial flats with slopes ranging from 0 to 8 percent. Sanwell series soils form in coarse lacustrine sediments. This lacustrine source is likely associated with the marl deposits that are mapped just upslope from the location of this soil unit. Typically, Sanwell series soils are characterized as loamy-skeletal, mixed, superactive, calcareous, thermic, Duric Torriorthents. The taxonomic soil classification, Duric Torriorthents, applies to soil units formed in hot and arid environments that do not exhibit well-developed soil horizons, but may include a notably harder and competent soil horizon within 40 inches of the soil surface (Borup 2004).

Yermo series soils mapped within this soil association exhibit the same characteristics as Yermo soils mapped as part of the Yermo, hot-Yermo-Arizo association.

3.3.2.4 Shamock Series

The Shamock series is restricted to the easternmost portion of the Project area and has the second greatest areal extent within the Project area. It is present within the Project area on slopes of 2 to 4 percent. This soil series exhibits a low water capacity with moderate permeability. It is assigned to hydrologic group C, which corresponds to a slow rate of water infiltration in soils with moderately fine to moderately coarse texture. The Shamock series has a pH level of 8.5. A well-indurated duripan is present between 25 and 40 inches from the surface of the soil unit. This soil unit has been given a poor rating for suitability for topsoil reclamation, because of difficulty of recovery (Borup 2004).

The soils of the Shamock series are typically moderately deep over a duripan. The well-drained soils occur on alluvial flats with slopes ranging from 0 to 4 percent. Shamock series soils form in alluvium derived from mixed rocks. Typically, Shamock series soils are characterized as coarse-loamy, mixed, superactive, thermic, Typic Haplodurids. The taxonomic classification Typic Haplodurids refers to aridisols, soils formed in arid environments with well-developed soil horizons that contain a duripan within the upper 40 inches of the soil unit (Borup 2004).

3.3.3 Erosion Potential

Water erosion of soils are typically indicated in soil surveys by two factors, Kw and Kf, where Kw represents the general susceptibility of the whole soil to sheet and rill water erosion, and Kf represents the susceptibility of only the soil's fine portion (<2 millimeters diameter) to these same forms of water erosion (USDA – NRCS 1993). Generally, soils that are more susceptible to

water erosion will exhibit greater Kw and Kf factors. The Yermo, hot-Yermo-Arizo association, located in the western two-thirds of the Project area, is the least susceptible to water erosion (lower Kw and Kf factors), whereas the other soil associations that are located in the eastern one-third of the Project area are more susceptible to water erosion (higher Kw and Kf factors).

Wind erosion may have adverse impacts on soils, particularly those that lack vegetation cover (USDA – NRCS 1993). The NRCS assesses a soil series' susceptibility to wind erosion by assigning each soil series to a WEG. This includes a rating on the WEI that is measured in tons of soil lost per acre per year. These determinations are made based upon the composition and texture of a given soil. For example, soils with well-established desert pavement are far less susceptible to wind erosion than unvegetated soils that are composed of fine sand soils assigned lower ratings of the WEG scale are more susceptible to erosion than soils assigned higher ratings. WEG ratings of 3 or 4 (on a scale of 1-8) are assigned to the Lewdlac-Yermo association; Sanwell-Sanwell, warm-Yermo association; and Shamock series. The Yermo, hot-Yermo-Arizo association is less susceptible to wind erosion and is assigned to a WEG of 5 (Borup 2004). Therefore, soils in the western two-thirds of the Project area are less susceptible to wind erosion than soils in the eastern one-third of the Project area.

3.3.4 Prime and Unique Farmland

The USDA uses the designation *prime farmland* to describe soils that have the correct combination of physical and chemical characteristics that allow the soil to produce significant amounts of food, feed, fiber, or oilseed crops. These characteristics include soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when properly managed with farming methods such as an adequate and dependable water supply (USDA – NRCS 1993). No soil within the Project area has been designated as prime farmland. However, irrigated farmlands are present south of the Project area. These agricultural areas are serviced by rotary irrigation systems that create the circular patterns easily visible in aerial photographs. Without the irrigation systems, it is unlikely that Amargosa Valley could support extensive agriculture.

3.4 WATER RESOURCES

This section presents an overview of the surface and groundwater resources in the ROI which could be affected by construction, operation, and maintenance of the proposed Project. The ROI for surface water is different from the groundwater ROI based on potential effects of the proposed Project on water resources. Surface water features in the ROI are described in Section 3.4.3, followed by a discussion of groundwater resources in Section 3.4.4. Because springs are a function of groundwater expression and influence, regional springs are discussed in the groundwater resources section.

3.4.1 Regulatory Framework

3.4.1.1 Federal

Federal laws and policies establish standards for clean water, controlling development in flood plains, and protecting the environment. The CWA 33 USC §§ 1251-1387, regulates both direct and indirect discharges, including stormwater discharges from construction and industrial activities.

Activities resulting in the dredging or filling of jurisdictional waters of the United States, which can include drainages and ephemeral washes, require authorization under a Section 404 permit issued by the USACE. In addition, an applicant for a federally permitted activity that may result in a discharge to jurisdictional waters must obtain from the State a Section 401 certification that the action will not violate state or federal water quality standards. In Nevada, the 401 Certificate is issued by the NDEP BWQP.

Quality of jurisdictional waters of the U.S. is protected through Sections 301 and 402 of the CWA, which regulates discharges of pollutants and stormwater discharges through the NPDES. In Nevada, authority to implement the NPDES permit program has been delegated to the NDEP BWPC.

The Safe Drinking Water Act (SDWA) is the main federal law that ensures the quality of Americans' drinking water. The SDWA was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources, including: rivers, lakes, reservoirs, springs, and groundwater wells. Under SDWA, the EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards (EPA 2010). The SDWA does not regulate private wells that serve fewer than 25 individuals (EPA 2010). The SDWA also mandates that a Groundwater Wellhead Protection Program be developed by each state in order to protect groundwater resources that serve as sources for public drinking water.

The National Flood Insurance Program (NFIP) is administered by the Federal Emergency Management Agency (FEMA), a component of the U.S. Department of Homeland Security. The NFIP enables property owners in participating communities to purchase insurance protection against losses from flooding. This flood insurance is designed to provide an alternative to federal disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods.

In support of the NFIP, FEMA identifies flood hazard areas throughout the United States by identifying and mapping Flood Hazard Boundary Maps, Flood Insurance Rate Maps, and Flood Boundary and Floodway Maps. Several areas of flood hazards are commonly identified on these maps. One of these areas is the Special Flood Hazard Area, which is defined as an area of land that would be inundated by a flood having a 1 percent chance of occurring in any given year (previously referred to as the base flood or 100-year flood). Development may take place within the Special Flood Hazard Area, provided that development complies with local floodplain management ordinances, which must meet the minimum Federal requirements.

Based on review of the Flood Insurance Rate Map for Nye County, Nevada, and Incorporated Areas (32023C8400E), there are no Special Flood Hazard Areas in or near the Project area.

3.4.1.2 State

The state serves in several relevant functions with regard to water regulation. First, Nevada law governing water rights is set forth in NRS Chapters 533 and 534. The NDWR, headed by the State Engineer, is responsible for the administration of these laws. Applications for new appropriations or to change water already appropriated under an existing right must be reviewed and approved by the State Engineer, prior to any water diversion. The State Engineer determines the limit and extent of water rights and establishes any appropriate conditions regarding these rights. In ruling on a water right application, the State Engineer must consider four criteria:

1) Is there unappropriated water available for the proposed use?
2) Will the proposed water use impair senior water rights?
3) Is the proposed water use in the public interest?
4) Is the proposed Project feasible, and if so is it filed for speculative purposes?

When a water rights permittee has "perfected" a water right; i.e., shown that the water has been put to beneficial use as defined by NRS 533.030 and NRS 533.035, the Nevada State Engineer's Office issues a Certificate of Appropriation. Once granted, water rights in Nevada have the standing of both real and personal property; this means that they are conveyed as an appurtenance to real property unless they are specifically excluded in the deed of conveyance. When water rights are purchased or sold as personal property or treated as a separate appurtenance in a real-estate transaction, the water rights are conveyed specifically by a deed of conveyance. It is possible to buy, sell, or lease water rights and change the water's point of diversion, manner of use, and/or place of use by filing an application with the State Engineer (NDWR 2009b).

The NDEP administers the Nevada Water Pollution Law (NRS 445A.300-730), which implements the state water quality standards and protection programs mandated by the CWA. The regulatory requirements governing these programs (Water Quality Standards Regulation) are published in 40 CFR § 131 and applicable sections of the NAC. States are responsible for reviewing, establishing, and revising water quality standards. Section 303(d) of the CWA requires states to provide a list of impaired waters only, identifying possible pollutants and prioritizing those waters for further pollution control. The Nevada Water Pollution Control Law applies the NPDES system to all water of the state, regardless of whether they are federal jurisdictional waters.

The State of Nevada Stormwater Program, administered by NDEP, requires operators of large and small construction sites to obtain an NPDES construction stormwater permit in order to discharge stormwater. The submittal of a NOI for inclusion under the State of Nevada's General Stormwater Permit and a SWPPP is required for all soil disturbing activities (including grading, trenching, and demolition), where one or more acres will be disturbed, and have a discharge of stormwater to a receiving water (e.g., wetlands, creeks, unnamed creeks, rivers, marine waters, ditches, and estuaries), and/or storm drains that discharge to a receiving water (NDEP 2009).

The NDEP administers the Wellhead Protection Program, which is developed and implemented at the local level. The NDEP offers guidance and enforces regulatory setbacks to protected groundwater and wellhead areas and tracks specific areas delineated as wellhead and source water protection areas.

The state also administers the federal SDWA, through the NDEP Bureau of Safe Drinking Water.

3.4.1.3 Local

The Nye County Water Resources Plan (Buqo 2002) outlines the county plan for ensuring adequate supplies of water remain available in Nye County to maintain and enhance the quality of the environment; to improve the quality of life for residents and visitors to the County; and to expand and diversify the economy of the County. In 2007 the Nevada Legislature established the Nye County Water District pursuant to NRS Chapter 542. The Nye County Water District Board was created to oversee the qualitative and quantitative status of water resources available for use within Nye County.

3.4.2 Data Collection Methods

Since the early 1950s, extensive investigations have been conducted to characterize water resources that have been, or may be, affected by activities at the Nevada Test Site and the proposed Yucca Mountain repository. In addition, because of the presence of environmentally sensitive areas at Devils Hole, Ash Meadows, and Death Valley, extensive hydrological monitoring infrastructure has been installed and has resulted in the accumulation of over 40 years of water level monitoring and water chemistry analysis in the Death Valley Hydrographic Region.

The DOE, in cooperation with the USGS and other federal, state, and local agencies, has conducted studies to evaluate water-resources potential of the region, evaluate the impacts of groundwater pumping, estimate groundwater recharge from wash infiltration, and evaluate regional groundwater flow. Between 1951 and 1996, more than 1,700 publications and abstracts have been written about the geology, hydrogeology, and hydrology of the Nevada Test Site area (Seaber et al. 1997). Since 1996, additional studies have been conducted as new technology has emerged, and the body of knowledge has increased. Hydrologic investigations relevant to the Amargosa Desert include measurements of evapotranspiration within the Central sub-region; construction of a dataset for pumping in the Amargosa Desert (and other areas); and measurement of groundwater recharge underneath the Amargosa River and irrigated fields in the Amargosa Farms area.

The references that were selected for use in this analysis are listed in Chapter 6 – References, with full bibliographic citations. The information compiled from these sources is assumed to be factual and sufficiently accurate for use in this analysis.

Additional data sources reviewed for this EIS include USGS topographic and aerial maps, reports and studies prepared by the DOE for the proposed Yucca Mountain Geologic Repository,

as well as additional water resource reports by various organizations. Basin water rights abstracts and pumpage inventories were obtained from the USGS and NDWR and were used as the basis for the values of perennial yield, committed water resources, and estimated water use in the ROI.

3.4.3 Surface Water Resources

For water planning and management purposes, the USGS and the NDWR, Department of Conservation and Natural Resources, have divided the state into 256 discrete hydrologic basins and sub-areas, within 14 major hydrologic units called Hydrographic Regions (NDWR 2009b). Hydrographic basins and sub-areas generally consist of valleys that are separated by surface-water drainage divides (Rush 1968).

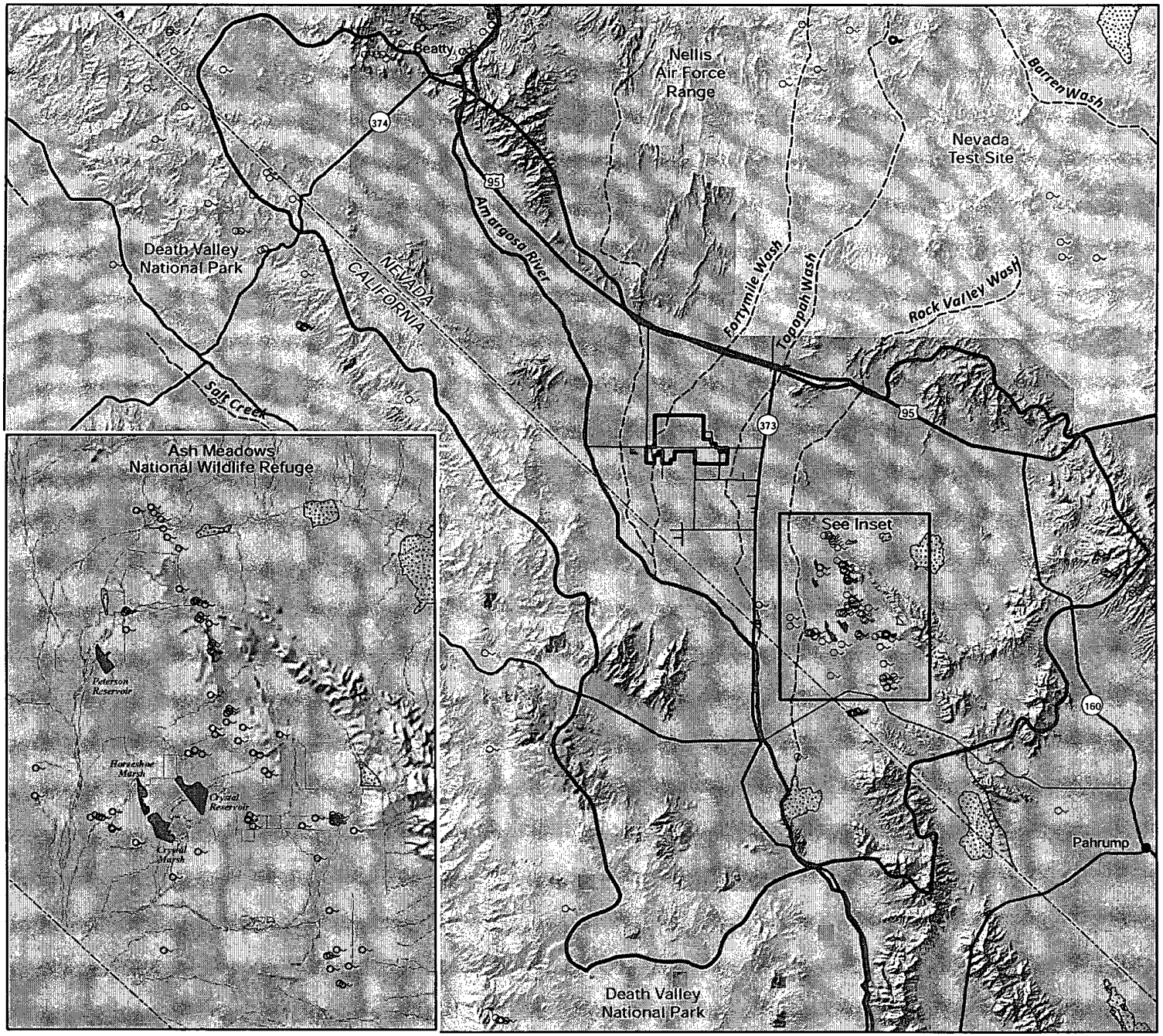
All Project components would be located within the Nevada portion of the Amargosa Desert Hydrographic Basin (#230), which is a part of the Death Valley Hydrographic Region (#14). The Amargosa Desert Hydrographic Basin covers 896 square miles (573,440 acres). Approximately 65 percent of the Amargosa Desert Hydrographic Basin is located in Nye County, with the remainder in Inyo County, California, primarily within Death Valley National Park.

3.4.3.1 Surface Water Features

The Project is situated within the Amargosa River drainage system (Figure 3-6). The Amargosa River begins in Oasis Valley, north of Beatty, and drains an area approximately 3,100 square miles by the time it reaches Tecopa, California. Its course extends approximately 60 miles farther, before terminating in the Badwater Basin in Death Valley National Park (DOE 2008). Basin relief is approximately 8,000 feet, ranging from approximately 7,700 feet above sea level at Pahute Mesa, Nevada, to approximately 300 feet below sea level at Badwater Basin in Death Valley, California (Tanko and Glancy 2001).

Major tributaries of the Amargosa River in Nevada include Thirsty Canyon and Beatty Wash in the northern reach, Fortymile Wash, Tonopah Wash, and Carson Slough along its central reach and China Ranch Wash and Salt Creek in the lower reach in California.

Despite the large drainage area, most of the Amargosa River and its tributaries are ephemeral, except in a few relatively short reaches of the River where discharging springs maintain small, perennial base flows. The Amargosa Desert portion of the river is dry more than 98 percent of the time (Stonestrom et al. 2007). Within the lower reach of the Amargosa River, small thermal springs near Shoshone and Tecopa, California contribute flow to the river. These springs also add to river flow in the reach between Tecopa and Dumont Sand Dunes. A 4-mile segment of the Amargosa River in this area was designated "wild and scenic" under the Omnibus Public Land Management Act of 2009. This Act, signed by President Barack Obama on March 30, 2009, provides protection of riverside land along both sides of a river in order to preserve the river's free-flowing nature.



Amargosa Farm Road Solar Energy Project (NVN-84359)

Water Resources Figure 3-6

LEGEND

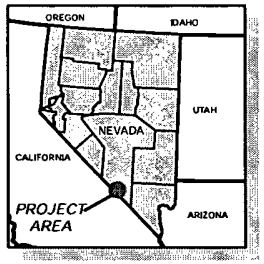
- Project Area

Water Resources

- Amargosa Desert Hydrographic Basin (230)
- Reservoir
- Playa
- River
- Wash
- Spring/Seep

General Reference Features

- Ash Meadows National Wildlife Refuge
- Death Valley National Park
- Nevada Test Site
- Nellis Air Force Range
- US Highway
- State Highway
- Local Road
- State Boundary



Source: Water Resources - USGS, 2005,2006;
Ash Meadows - USFWS, 2005;
Land Ownership - BLM, 2007;
Local Roads - Terra Spectra, 2009;
Highways - ESRI, 2005

September 2010

0 6 12 Miles

The Project site is traversed by Fortymile Wash, which is tributary to the Amargosa River and originates in the mountains of the Nevada Test Site directly to the north. Along its 93-mile length, the Fortymile Wash drains the western slopes of Shoshone Mountain, the eastern slopes of Yucca Mountain, and the western part of Jackass Flats all on the Nevada Test Site. Fortymile Wash has a sizeable canyon associated with its upper reaches between the mountains and remains a moderately confined channel to approximately one mile upstream of US 95 where the wash widens into several distributary channels. These numerous channels form a less defined drainage pattern that persists downstream to the confluence with the Amargosa River floodplain. The nearest surface water impoundments are Peterson Reservoir, Crystal Reservoir, Lower Crystal Marsh, and Horseshoe Reservoir in the Ash Meadows NWR, approximately 7 miles southeast of the Project area. The largest of these is Crystal Reservoir, a manmade impoundment at Ash Meadows, which captures the discharge from several springs in the area and has a capacity of 1,500 acre-feet (1.8 million cubic meters). Crystal Reservoir and other smaller pools in Ash Meadows drain to the Amargosa River through Carson Slough (DOE 2008).

3.4.3.2 Flood Occurrence

Streamflow characteristics of the Amargosa River have been studied for at least 45 years, with USGS stream gage data being recorded since 1964 near Beatty (USGS streamflow gauging station 10251220). Other stream gages and thermal detection gages have been installed along the Amargosa River; though they have not been continuously monitored.

Streamflow characteristics of Fortymile Wash have been similarly studied for the past 26 years; primarily within the Nevada Test Site, directly north of the Project area and US 95, and to a lesser extent in Amargosa Valley. USGS stream gage data is available at the Nevada Test Site southwestern boundary, upstream of US 95 (USGS streamflow gauging station 10251258).

As part of the DOE site characterization, investigations for Yucca Mountain (studies pertaining to surface-water runoff, including the potential for flooding in Fortymile Wash and Amargosa River) have been conducted (Beck and Glancy 1995; Tanko and Glancy 2001). Although flow in the Fortymile Wash is rare, the area is subject to flash flooding from intense summer thunderstorms or sustained winter precipitation. When these events occur, intense flooding can include mud and debris flows, in addition to water runoff in both the Fortymile Wash and Amargosa River (Blanton 1992).

At least three major flood events have occurred for which it is well documented that flows from Fortymile Wash and Amargosa River completely traversed the Amargosa Desert from the Nevada Test Site to Death Valley. These were in 1969, 1995, and 1998 (USGS 2008). The 1969 flood was the largest, producing a peak flow that exceeded the median annual peak flow by more than two orders of magnitude (Stonestrom et al. 2007). Beck and Glancy (1995) documented conditions during March 1995 and February 1998, when Fortymile Wash and the Amargosa River flowed simultaneously through their primary channels to Death Valley. During both floods, surface water from the Nevada Test Site flowed to the Amargosa River mainly via the Fortymile Wash, and road overflows were observed at similar locations (Tanko and Glancy

2001). In Fortymile Wash, a peak streamflow of approximately 3,000 cubic feet per second in 1995 severely scoured and eroded the channel, causing extensive road damage on the Nevada Test Site as well as to US 95 (Beck and Glancy 1995).

3.4.3.3 Surface Water Quality

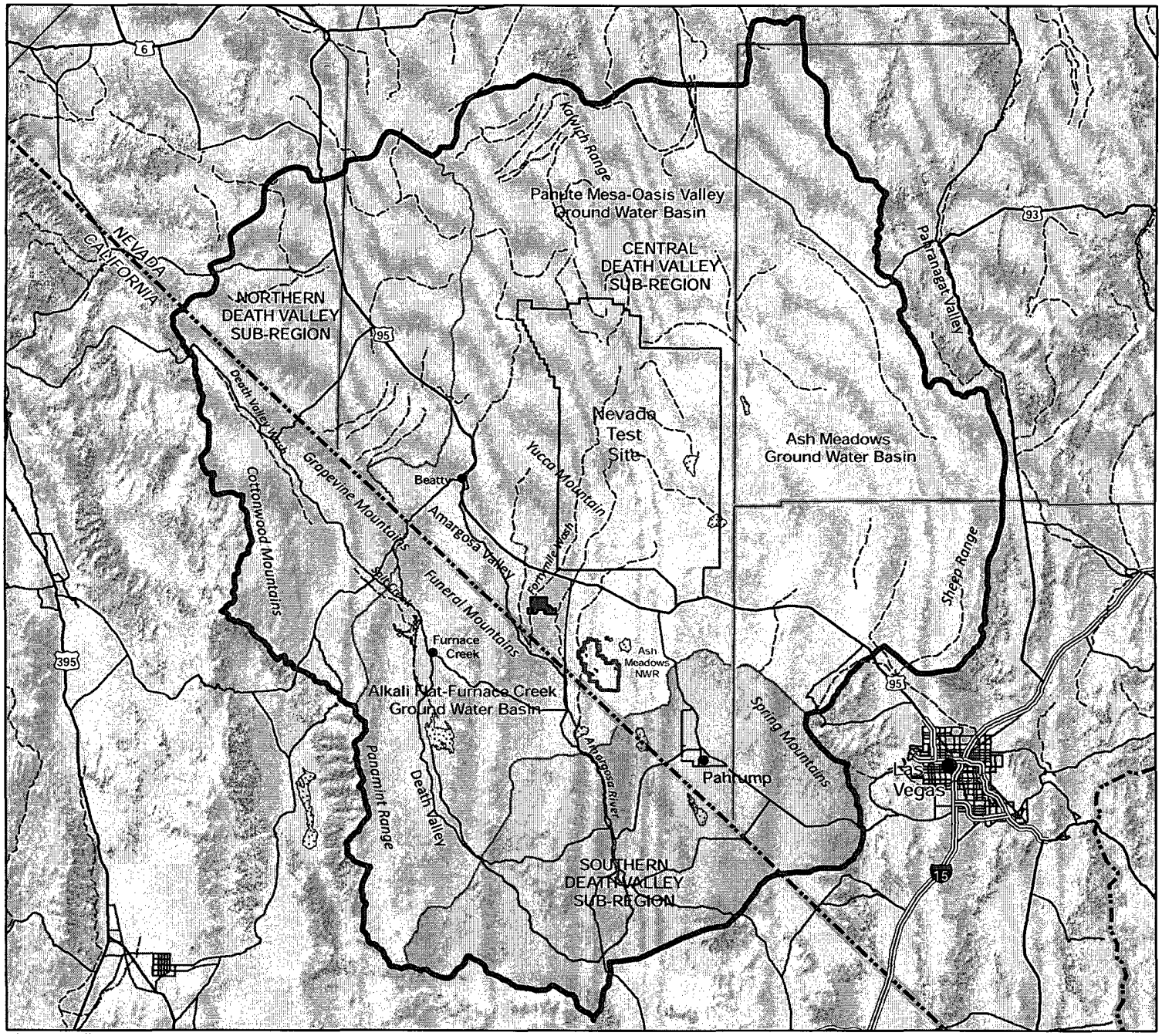
Section 305(b) of the CWA requires states to make water quality assessments and provide water quality reports to the EPA; CWA Section 303(d) requires states to identify waters, through their Section 305(b) water quality assessments, that do not or are not expected to meet applicable water quality standards with federal technology-based standards alone. Under CWA Section 303(d), States also are required to develop a priority ranking for these waters that takes into account the severity of the pollution and the designated uses of the waters. Once this listing and ranking of impaired waters is completed, States are required to develop Total Maximum Daily Loads for these waters in order to achieve compliance with the water quality standards. Nevada's 2006 Section 303(d) list of impaired waters shows no CWA Section 303(d) impaired waters in the Project area.

3.4.4 Groundwater Resources

The ROI for groundwater resources is the Death Valley Regional Flow System (DVRFS). The DVRFS (used as the basis for modeling groundwater flow for the Project) covers an area of 15,800 square miles and includes much of southern Nevada and the Death Valley region of eastern California (Harrill et al. 1998). As shown in Figure 3-7, this groundwater flow system is west of Las Vegas, Nevada, and includes parts of Clark, Esmeralda, Lincoln, and Nye counties, Nevada, and Inyo and San Bernardino counties, California. Death Valley, the largest valley within the flow system, forms the southwestern boundary of the flow system.

As shown in Figure 3-8, a total of 30 hydrographic areas are recognized within the DVRFS. Hydrographic areas are delineated primarily from topography and geologic structures, and generally correspond to major surface drainages. These areas serve as the basic units used by State and local agencies for water-resources planning, and in combination, form the regional flow systems delineated throughout the area (Harrill et al. 1998).

Groundwater flow within the DVRFS is divided into subregions that are further divided into sections, and the sections are grouped into groundwater basins. These divisions are based on locations of recharge areas; regional hydraulic gradients; distribution of aquifers, structures, and confining units that affect flow; and location of major discharge areas (Belcher 2004). The Project area is located within the Central Death Valley subregion. In this subregion, the dominant flow paths are associated with major regional or intermediate discharge areas and have been grouped into three groundwater basins: (1) Pahute Mesa-Oasis Valley basin, (2) Ash Meadows basin, and (3) Alkali Flat-Furnace Creek basin. The Project is situated within the Alkali Flat-Furnace Creek basin. Groundwater is derived from recharge on Pahute Mesa, Timber and Shoshone Mountains, and the Grapevine and Funeral Mountains. Additional recharge may occur as throughflow from Sarcobatus Flat, Oasis Valley, and Ash Meadows. Recharged groundwater then moves through volcanic rock aquifers in the north and carbonate rock aquifers in the south towards discharge areas in the southern and southwestern portions of the basin (Belcher 2004).



Amargosa Farm Road Solar Energy Project (NVN-84359)

Death Valley Regional Flow System Figure 3-7

LEGEND

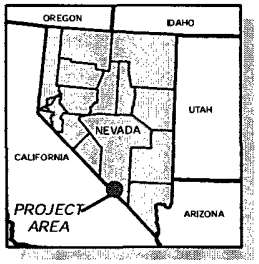
- Project Area
- Death Valley Regional Flow System
- Northern Death Valley Sub-region
- Southern Death Valley Sub-region

Central Sub-region Ground Water Basin

- Alkali Flat-Furnace Creek
- Ash Meadows
- Pahute Mesa-Oasis Valley

General Reference Features

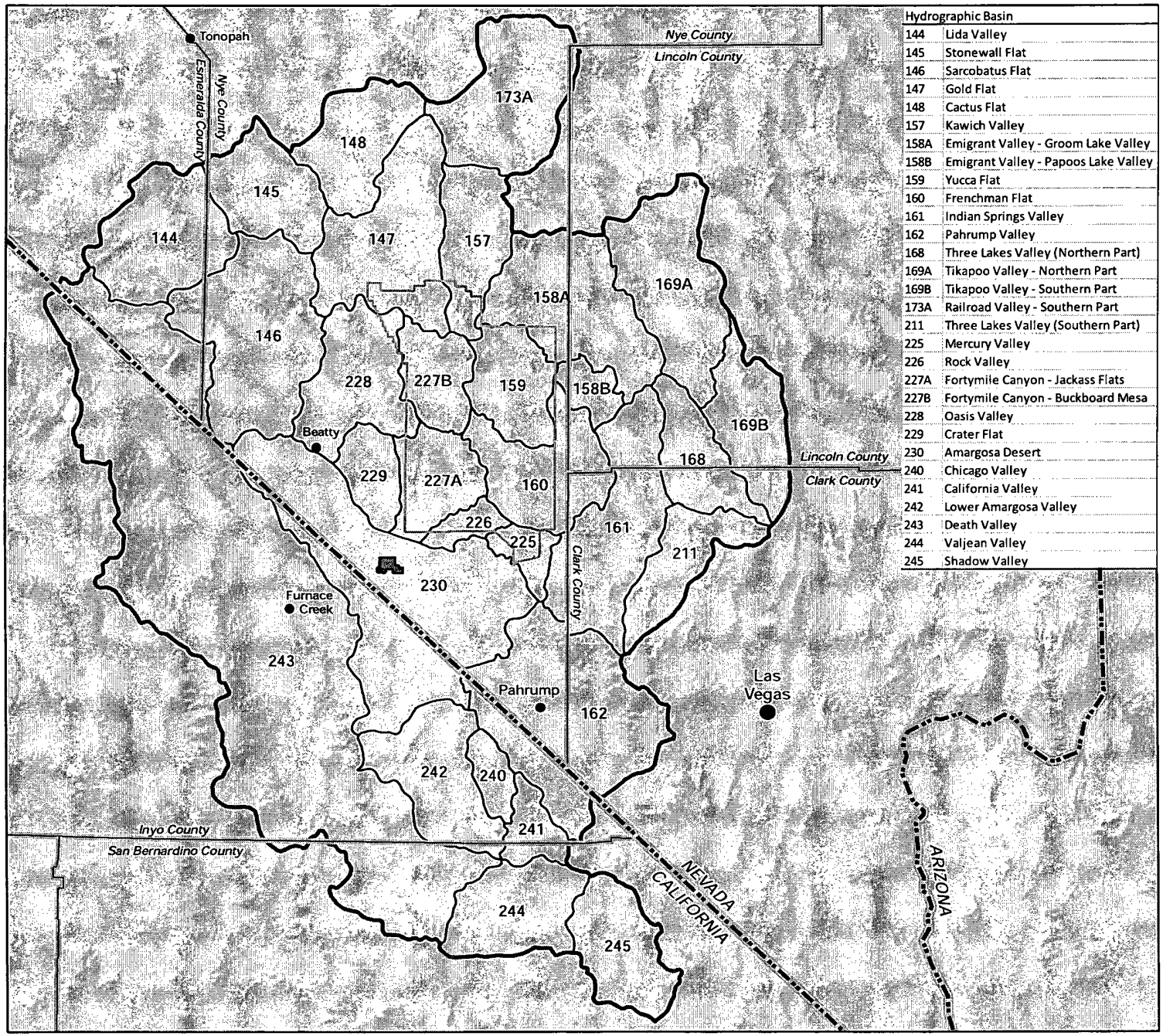
- Interstate
- US Highway
- Major Road
- River
- Wash
- State Boundary
- County Boundary
- City / Town
- Playa



Source: DVRFS - USGS, 2004,
Ash Meadows - USFWS, 2005
Hydrology, Roads, Boundarys, Hillshade - ESRI, 2009

September 2010

0 10 20 Miles



Hydrographic Basin	
144	Lida Valley
145	Stonewall Flat
146	Sarcobatus Flat
147	Gold Flat
148	Cactus Flat
157	Kawich Valley
158A	Emigrant Valley - Groom Lake Valley
158B	Emigrant Valley - Papoos Lake Valley
159	Yucca Flat
160	Frenchman Flat
161	Indian Springs Valley
162	Pahrump Valley
168	Three Lakes Valley (Northern Part)
169A	Tikapoo Valley - Northern Part
169B	Tikapoo Valley - Southern Part
173A	Railroad Valley - Southern Part
211	Three Lakes Valley (Southern Part)
225	Mercury Valley
226	Rock Valley
227A	Fortymile Canyon - Jackass Flats
227B	Fortymile Canyon - Buckboard Mesa
228	Oasis Valley
229	Crater Flat
230	Amargosa Desert
240	Chicago Valley
241	California Valley
242	Lower Amargosa Valley
243	Death Valley
244	Valjean Valley
245	Shadow Valley

Amargosa Farm Road Solar Energy Project (NVN-84359)

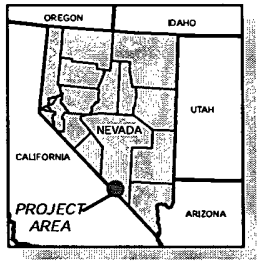
Hydrographic Basins
Figure 3-8

LEGEND

- Project Area
- Death Valley Regional Flow System
- Amargosa Desert Hydrographic Basin (230)
- Nevada Test Site

General Reference Features

- State Boundary
- County Boundary
- City / Town



Source: DVRFS, Basins - USGS 2009
Nevada Test Site - USGS GAP 2005
Boundaries, Hillshade - ESRI, 2009

September 2010

0 10 20 Miles

Within the Alkali Flat-Furnace Creek basin, the Project is further divided into the Amargosa River Section. Recharge to this section is predominantly by throughflow in the basin-fill sediments from Oasis Valley, Crater Flat, Fortymile Canyon and Wash, and Specter Range sections (Belcher 2004).

Three types of aquifers are recognized in the region: the volcanic aquifer, alluvial aquifer, and carbonate aquifer. The most developed and utilized water-bearing source in the basin is the valley fill alluvial aquifer. The Valley-fill aquifer as described by Winograd and Thordarson (1975) is present, on average, between 650 and 960 feet deep. The Lower Carbonate aquifer as described by Winograd and Thordarson (1975) is present, on average, between 1,370 and 1,800 feet deep. As described in Chapter 3.3, Devils Hole in the Ash Meadows area is a water-filled cave system in the Paleozoic carbonates of the Bonanza King Formation. This suggests that the surface water in the Ash Meadows area is linked to the Lower Carbonate Aquifer as described by Winograd and Thordarson (1975).

Under the Amargosa Farms area, where the proposed Project would be located, the depth to groundwater ranges from approximately 135 feet below land surface in the northwest to approximately 90 feet below land surface near the Longstreet Inn at the California/Nevada state line (Buqo 2002).

Due to concerns regarding the use of groundwater for Project construction and operations, a numerical groundwater flow model of the DVRFS was used to evaluate the regional effects to water resources associated with current use and the potential regional effects to water resources associated with the proposed Project. The reader is referred to Section 4.4 (Water Resources) for a summary of the groundwater flow modeling and Appendix B for the complete groundwater flow modeling report.

3.4.4.1 Groundwater Recharge and Discharge

Most groundwater recharge in southern Nevada is derived from winter and spring precipitation, which represents approximately 40 to 60 percent of the total annual precipitation. Precipitation reaches the groundwater reservoirs through streams, originating in uplands and eventually discharging onto alluvial aprons or by infiltrating directly into consolidated rock and percolating vertically and laterally to the valley fill aquifer (BLM Las Vegas District RMP 1998). Recharge may also occur from infiltration during ephemeral flows of the Amargosa River and Fortymile Wash (Savard 1998; Beck and Glancy 1995; Stonestrom et al. 2007). Groundwater recharge was found to be narrowly focused beneath the Amargosa River channel, flanked by large tracts of recharge-free basin floor, in a study conducted in 1998-2001 (Stonestrom et al. 2007).

Stonestrom et al. (2007) noted differences in recharge beneath agricultural areas versus native vegetation. Recharge was found to be negligible beneath undisturbed native vegetation covering most of the Amargosa Desert floor, where water-potential profiles indicate upward flow and atmospherically deposited salts have been accumulating more or less continuously since the end of the Pleistocene Epoch. Accumulation of salts has formed pronounced bulges just below the root zone. In contrast, beneath both irrigated fields and the Amargosa River channel, extreme water potentials and low salt concentrations indicate active deep percolation and groundwater

recharge. Transit times of recharge beneath the channel are on the order of centuries. Transit times of irrigation-return flow are on the order of decades (Stonestrom et al. 2007)

Groundwater discharges from the Amargosa Valley Hydrographic Basin include: (1) evapotranspiration, (2) discharge from springs, (3) flows across a groundwater flow system boundary to an adjacent system, and (4) groundwater pumping from underground sources. These functions are described in the following section. Activities such as groundwater pumping for agricultural uses and human consumption remove water from storage in a groundwater system, thereby reducing hydraulic heads which are measured as groundwater levels in open wells. Groundwater pumping also can affect streams or springs in direct hydraulic connection with the groundwater system, because declining groundwater levels can lead to increased recharge from streams and decreased spring flow.

3.4.4.2 Evapotranspiration

Evapotranspiration is the combined process of evaporation and the transpiration of water through plant tissue into the atmosphere. Evapotranspiration is a critical component of the water cycle, and thus an important component of many hydrological and climate models. However, evapotranspiration is difficult to measure directly. It is calculated from climate data, factors representing vegetation characteristics, and water supply.

Historically, estimates of evapotranspiration in the DVRFS were computed as part of regional groundwater assessments (Malmberg and Eakin 1962; Eakin 1963; Pistrang and Kunkel 1964; Malmberg 1967; Rush 1968). These regional assessments estimated annual evapotranspiration losses as the product of the acreage of phreatophytes within a discharge area and an annual evapotranspiration rate representative of the vegetation and soil conditions of the discharge area (Laczniak et al. 1999).

Estimates of the total amount of evapotranspiration in the Amargosa Desert Hydrographic area vary. Walker and Eakin (1963) estimated 24,000 acre-feet of annual evapotranspiration in the Amargosa Desert. Of this total, approximately 10,500 acre-feet were determined to be from Ash Meadows (Winograd and Thordarson 1975); and the remainder from other smaller areas of groundwater discharge found throughout the Amargosa Desert.

Recent studies of evapotranspiration rates for vegetation and soil conditions in the regional area (Johnson 1987; Czarnecki 1997; Laczniak et al. 1999; Nichols 2000) indicate rates somewhat different than those presented in earlier studies. Based on the updated data, Laczniak et al. (1999) estimated 22,000 acre-feet of annual evapotranspiration in the Ash Meadows area.

3.4.4.3 Regional Springs

Several springs of regional importance lie outside of the immediate Project area. These include more than 30 seeps and springs in the Ash Meadows NWR, including Devils Hole, a 40-acre detached unit of Death Valley National Park. Devils Hole provides habitat for the only naturally occurring population of the endangered Devils Hole Pupfish (*Cyprinodon diabolis*).

Springs in the Ash Meadows NWR are created by groundwater discharge along the Ash Meadows fault system (Denny and Drewes 1965). The Ash Meadow fault system trends southeast to northwest through the eastern portion of the Ash Meadows NWR. Groundwater discharging at Ash Meadows originates from areas to the north and east and is transported into the area through the regional carbonate rock aquifer. Winograd and Friedman (1972) suggested that 65 percent of the spring-fed waters originate from the Spring Mountains and Sheep Range, 30 to 60 miles to the east; and 35 percent comes from underflow from the Pahranagat Valley, approximately 90 miles northeast of Ash Meadows.

Other springs in the Ash Meadows area discharge from the valley-fill aquifer, which is derived from and connected to the carbonate aquifer, but is overlain by valley-fill sediments. The total annual discharge of these springs is estimated at approximately 17,000 afy (Walker and Eakin 1963; Laczniak et al. 1999).

3.4.4.4 Groundwater Pumping and Use

Many reports have been published that estimate groundwater pumping and use in Nevada. Every 5 years since 1950, the USGS has compiled and published water use data in circulars entitled "Estimated use of water in the United States." The circulars include water use for several categories including public and domestic use, agricultural use, and industrial use. These reports also include population and irrigated acreage data. The Nevada State Engineers Office also has reported water use and pumping, in which water usage is estimated by county and hydrographic area.

The USGS data reflects different groundwater withdrawal amounts than the State Engineer's groundwater pumping inventory. The reason for this difference is that the USGS uses satellite imagery and consumptive use estimates to create their groundwater use inventory while the State Engineer's inventory bases its inventory upon metered amounts or estimates provided by a pumpage inventory field report for water rights owners with unmetered wells. Pumping estimates for unmetered wells are generally approximate and are based on rudimentary records, or consumptive use estimates made by the State Engineer Office, based on a standard consumptive use amount of 5 afy per acre. For example, 160 acres of irrigation at 5 afy per acre would require 800 afy. In 2003, 12 percent of reported irrigated acreage for Amargosa Desert was metered (Moreo et al. 2003). Table 3-7 lists pumpage history in the Amargosa Desert from 1983 through 2009. No data was available for 1984.

The primary use of groundwater in the Amargosa Desert Hydrographic Basin is for agricultural irrigation. Irrigation in the Amargosa Farms area began on a limited basis around 1917 and continued on a modest scale until roughly 1954. Intensive agriculture in Amargosa Desert began in 1954 as land was patented under the Desert Land Act (Moreo et al. 2003), and irrigated acreage exceeded 2,000 acres by 1965. Between 1954 and 1965, the number of wells grew by roughly 150 to support agricultural production (Laczniak et al. 1999; Stonestrom et al. 2003). As of 2009, more than 1,000 water supply wells have been drilled in the Amargosa Desert hydrographic basin (NDWR 2010a).

Table 3-7 Pumpage Inventories for the Amargosa Desert Hydrographic Basin 1983 through 2009

Year	Irrigation	Irrigation*	Industrial	Commercial[1]	Quasi-Municipal / Domestic[1]	Quasi-Municipal / Commercial[1]	Domestic[1]	Total
1983	5,893.0	3,212.0	850.0	20.0	450.0			10,425.0
1984	-	-	-	-	-	-	-	-
1985	5,807.0	2,665.0	950.0	20.0	230.0			9,672.0
1986	5,552.9	1,000.0	584.0	10.0	125.0			6,971.9
1987	4,500.0	1,200.0	298.0	10.0	125.0			6,133.0
1988	2,666.0	312.0	569.0	10.0	125.0			3,682.0
1989	1,266.0	300.0	525.0	10.0	125.0			2,226.0
1990	4,603.1	350.0	383.6	10.0	125.0			5,471.7
1991	4,716.5	225.0	335.0	10.0	100.0			5,386.5
1992	5,711.0	50.0	347.5	10.0	100.0			6,218.5
1993	8,558.8	150.0	495.0	10.0	100.0			9,313.8
1994	8,892.0	1,085.0	340.0	10.0	100.0			10,427.0
1995	10,839.0	1,515.0	349.0	10.0	100.0			12,813.0
1996	9,263.0	1,780.0	272.0			205.0	50.0	11,570.0
1997	9,349.0	1,105.0	251.0			576.0	366.0	11,647.0
1998	9,667.0	2,373.0	237.0			537.0	382.0	13,196.0
1999	9,069.0	1,766.0	253.0			593.0	364.0	12,045.0
2000	9,086.0	625.0	243.0			1,057.0	378.0	11,389.0
2001	8,782.0	625.0	237.0			1,067.0	396.0	11,107.0
2002	8,951.0	625.0	386.0			1,128.0	415.0	11,505.0
2003	9,846.0	625.0	333.0			1,324.0	437.0	12,565.0
2004	9,979.0	625.0	309.0			1,319.0	453.0	12,685.0
2005	10,139.0	625.0	247.0			1,332.0	466.0	12,809.0
2006	11,511.0	1,613.0	308.0			1,844.0	491.0	15,767.0
2007	11,909.0	2,150.0	306.0			1,793.0	55.0	16,663.0
2008	11,419.0	937.0	933.0			3,984.0	517.0	17,790.0
2009	10,493.0	984.0	510.0			3,905.0	487.0	16,380.0

* No Permits or Certificates

1 Prior to 1996, Quasi-Municipal/Domestic and Commercial inventories were calculated under different classifications. Beginning in 1996 commercial water use, which includes local dairies, were included with quasi-municipal. Domestic water use is inventoried separately and includes water rights for domestic use over 2.02 afy.

Source: NDWR 2010a

As shown in Table 3-7, total groundwater withdrawal from Amargosa Desert fluctuates annually, but has steadily increased over the past 5 years. The annual variation in total groundwater withdrawal is attributed primarily to crop and irrigation cycles, and the amount of precipitation in a given year. Alfalfa fields typically are allowed to fallow 2 years during a 7-year period. Other fields are irrigated once every 5 years to demonstrate beneficial use and maintain water rights (Moreo et al. 2003).

Non-irrigation groundwater use in the Amargosa Desert includes industrial, quasi-municipal/ commercial, and domestic. Industrial water use is primarily related to mineral exploration activities at the American Borate, IMV, and Barrick Bullfrog Mine. Groundwater use for mining has fluctuated over the years, based on the rise and fall of ore prices.

Quasi-municipal and commercial water use in the Amargosa Valley is primarily related to large-scale farming operations, such as dairies, and to a lesser degree, municipal water uses by local water providers and businesses. There are only three water supply systems in the Amargosa Valley that are publically owned. They include the Amargosa Elementary School, Amargosa Town Complex, and the Amargosa Water Company.

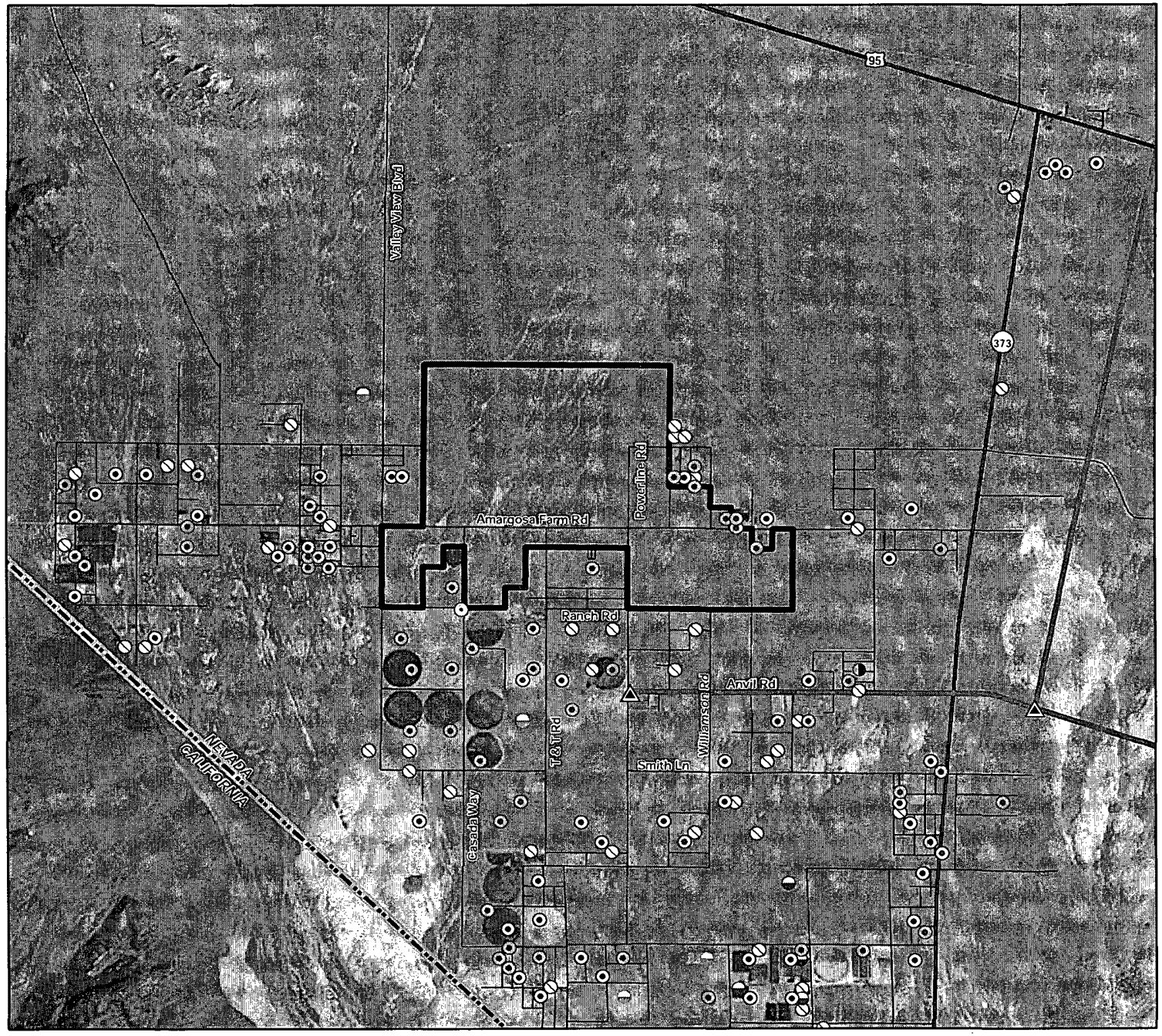
Most residents in the Amargosa Valley area rely on individual wells for their water supply. In 2000, there were 378 domestic wells listed in the NDWR database. By the end of 2008, a total of 517 domestic wells had been drilled in the Amargosa Desert Hydrographic Basin. It is unknown how many of these wells are currently being pumped. Under Nevada water law, a domestic well may use up to 1,800 gallons per day (2.02 acre-feet annually) for domestic purposes without the benefit of a water right permit (NRS § 534.180). In 2009, this equates to a potential of 1,046.36 afy being pumped from existing domestic wells.

Wells within 3 miles of the Project area are shown on Figure 3-9. During the biological surveys conducted in the Spring 2009, several water wells were found scattered throughout the site. Most of these wells have either been plugged or have welded covers on the casing; at least one well was uncapped. It is assumed these wells are associated with past agricultural fields and desert land entrees that have been filed with BLM. Prior to the enactment of FLPMA, trespass agricultural fields were established throughout the Amargosa Valley. Over the years, these fallow agricultural fields have reverted back to desert scrub communities.

3.4.4.5 Water Rights

Water rights in the Amargosa Desert Hydrographic Basin are associated with commercial and industrial use, domestic wells, mining, agriculture (farming, livestock, and dairies), and federal use. Water rights are issued for pumping from an underground source, either from the valley-fill deposit or from fractured or faulted carbonate and volcanic rock; and diversion of surface or spring flows. The withdrawal of groundwater from much of the area is limited by federal mandates instituted to protect rare and endangered species dependent for their survival on regional springflow in Ash Meadows, Devils Hole, and Death Valley.

The perennial yield of the Amargosa Desert Hydrographic Basin was estimated by Walker and Eakin (1963) to be 24,000 afy. Perennial yield of a groundwater reservoir may be defined as the maximum amount of groundwater that can be withdrawn each year over the long term without depleting the groundwater reservoir. Withdrawals of groundwater in excess of the perennial yield contributes to adverse conditions such as water quality degradation, storage depletion, diminishing yield of wells, increased cost due to increased pumping lifts, land subsidence, and possible reversal of groundwater gradients.



Amargosa Farm Road Solar Energy Project (NVN-84359)

Wells Within 3-Miles of Project Figure 3-9

LEGEND

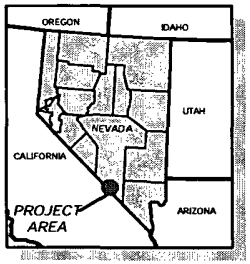
Project Area

Wells

- Abrogated
- Certificated
- Permitted
- Ready for Action
- Ready for Action (Protested)
- Relinquished a Portion

General Reference Features

- Existing Transmission Line (<230kV)
- Existing Substation
- Proposed Project Well
- Highway
- Local Road
- State Boundary



Source: Transmission Lines, Substations - Platts, 2009;
Wells - Nevada State Enginee, 2008;
Local Roads - TerraSpectra Geomatics 2009;
Highways, Imagery - ESRI, 2009

September 2010

0 1 2 Miles

Although numerous studies have been conducted to revise the current perennial yield estimate, the Office of the State Engineer maintains that none of the new studies offer new and convincing arguments that the perennial estimates should be revised (Nevada State Engineer 2007).

According to the State Engineer, the estimated perennial yield of 24,000 acre feet includes 17,000 acre-feet discharged by springs in Ash Meadows and 7,000 acre-feet from underground water in the Amargosa Desert Hydrographic Basin. At the time of publication, there are over 25,000 acre-feet of permitted underground water rights. The 17,000 acre-feet discharged by springs in Ash Meadows, not included in the underground rights total, are used to satisfy the certificated rights of the USFWS for wildlife conservation purposes.

Table 3-8 lists the current (2010) annual duty for the various types of water use in the Amargosa Desert Hydrographic Basin. The annual duty is the total volume of water per year that may be diverted under a vested, permitted, or certificated water right authorized by the State Engineer. As shown in Table 3-8, committed groundwater resources of the Amargosa Desert Hydrographic Basin currently exceed the groundwater basin's estimated perennial yield.

Table 3-8 Summary of Groundwater Use in the Amargosa Desert Hydrographic Basin

Manner of Use	Active Annual Duty* (Acre-Feet)	Pending Annual Duty* (Acre-Feet)
Commercial	1,447.59	452.30
Domestic	3.22	0.00
Irrigation - Domestic	1,942.16	0.00
Irrigation	18,886.43	160.10
Industrial	0.00	400.00
Mining and Milling	1,923.49	0.00
Municipal	431.79	0.00
Quasi-Municipal	588.61	5.00
Wildlife	9.42	0.0
Total	**25,232.73**	**1,017.40**

* May include supplemental duties as well as duties associated with applications to change
Source: NDWR 2010b

Water rights in the Amargosa Desert Hydrographic Basin have been scrutinized for many years due to the proximity of environmentally sensitive areas at Devils Hole, Ash Meadows, and Death Valley. In the late 1960s and early 1970s, ranching and farming operations in the Ash Meadows area resulted in a decline in water levels in Devils Hole, which threatened the survival of the Devils Hole Pupfish. As a result, the NPS filed a lawsuit against the land owner, Cappaert Ranch, to restrict groundwater pumping.

In 1973 the U.S. District Court granted a preliminary injunction preventing pumping that would lower the pool level more than 2.98 feet below the datum. The injunction was made permanent by the District Court's decision, and upon appeal, the Supreme Court affirmed the lower court decision. In 1978 the District Court issued a revised permanent injunction to limit pumping to maintain a daily mean water level of 2.69 feet below the datum, based on scientific studies (Bedinger and Harrill 2006).

By 1988 the pool level had recovered to roughly 0.98 feet below the pre-pumping level when it began to decline. Concerns were raised that in the intermediate to long-term future the pool level would fall below the court-mandated minimum level. Since 1989, to protect the springs and seeps in the Ash Meadows NWR area, the USFWS has acquired 57 permitted or certificated water rights, totaling over 16,908 afy in the Amargosa Desert Hydrographic Basin, making the USFWS the largest water rights holder in the basin. These water rights, formerly used primarily for irrigation, were changed to modify the place and manner of use for wildlife purposes.

To further protect federally reserved water rights at Devils Hole, the Nevada State Engineer issued Order 1197 on November 4, 2008. Information provided during the administrative hearing for Order 1197 showed the water level in Devils Hole to be only 0.6 to 0.7 feet above the threshold level mandated by the U.S. District Court. The State Engineer ruled that the conditions warranted the curtailment of future appropriations of underground water and additional regulations of change applications within portions of the Amargosa Desert Hydrographic Basin. The State Engineer ordered, with exceptions, that "any applications to appropriate additional underground water and any application to change the point of diversion of an existing groundwater right to a point of diversion closer to Devils Hole, described as being within a 25-mile radius from Devils Hole within the Amargosa Desert Basin, will be denied."

Certain applications are excepted from this restriction:

- Any application within the described area that seeks to change an existing point of diversion closer to Devils Hole but remains: (1) within its existing place of use and (2) is no more than 1/2 mile from its original point of diversion.
- Those applications filed which seek to appropriate 2.0 afy or less may be considered and shall be processed subject to NRS 533 and 534.
- Projects that require changes of multiple existing rights; the State Engineer may compare the net impact of the proposed changes to Devils Hole to the impacts of the base rights to Devils Hole. If the net impact of the proposed changes is the same or less than the base rights impacts, as determined by the State Engineer, such change applications may be considered and shall be processed subject to NRS 533 and 534. In no such case shall new points of diversion be allowed within 10 miles of Devils Hole.
- Those applications for environmental permits filed pursuant to NRS 533.437 to 533.4377, inclusive.
- Those applications filed pursuant to NRS 533.371.

The proposed Project is located within the 25-mile radius of Devils Hole. However, since the Proponent would use existing water rights for the Project, and would not move the point of diversion closer to Devils Hole, the Project would comply with Order 1197.

3.4.4.6 Groundwater Quality

With the exception of radionuclide contamination at the Nevada Test Site, the water quality of the surface and groundwater resources in the ROI is generally good. Elevated concentrations of fluoride, sulfate, arsenic, and TDS are present in some areas, and traces of naturally occurring uranium are also present (DOE 2008). Preliminary water quality tests of the well to be used for the proposed Project indicate the well water meets EPA drinking water standards.

3.4.4.7 Jurisdictional Waters, Drainage, and Riparian Areas

The USACE regulates "discharge of dredged or fill material" into "waters of the U.S., which includes tidal waters, interstate waters, and all other waters that are part of a tributary system to interstate waters or to navigable "waters of the U.S." (33 CFR 328.3(a)). Once waters have been determined to be jurisdictional "waters of the U.S." the USACE generally takes jurisdiction within the plane of ordinary high water determined by erosion, the deposition of vegetation or debris, and changes in vegetation. The law requires authorization from the Secretary of the Army, acting through the USACE, for the construction of any structure in or over any navigable water of the United States, or any other water of the United States.

Before the USACE will issue a Section 404 permit, applicants must receive a Section 401 Water Quality Certification from the NDEP BWQP. By federal law every applicant for a federal permit or license for an activity which may result in a discharge into a water body must request State certification that the proposed activity will not violate state and federal water quality standards. The state may respond to the application in three ways:

- **Waiver** – Under federal law the state may waive its certification authority if it takes no action on an application within a "reasonable time" not to exceed one year. For Section 404 permit projects, the USACE has defined "reasonable time" to be 60 calendar days, starting with receipt of a complete application by the state, but may extend this period up to one year on a case-by-case basis. Waivers carry no conditions, and are, in some ways, equivalent to certification without conditions.

- **Certification** – Certification is based on a finding that the proposed Section 404 discharge will comply with all pertinent water quality standards. In order to allow certification, special conditions may be required by the the state in order to remove or mitigate potential impacts to water quality standards. Such conditions must ultimately be included in the federal Section 404 permit.

- **Denial** – The state has the option to deny certification if it is unable to find that the project will comply with water quality standards or other applicable requirements. If a project is denied certification, a Section 404 permit for it cannot be issued by the federal government. In some instances denial is necessary due to failure by the applicant to meet

a procedural requirement or the ability to meet water quality standards. Once the deficiency is addressed, the application for water quality certification may be reconsidered.

Representatives from the USACE, EPA, BLM, USFWS, and the Project Proponent and consultants met on May 13, 2010 to discuss the geographic extent of jurisdictional waters on the Project site and the direct and indirect impacts that could occur as a result of Project construction. The criteria that may be considered when determining impacts include habitat for plants and animals, recharge to the groundwater system, and sediment transport.

Preliminary discussions with the USACE indicate that jurisdictional washes are present in the Project area. However, the extent to which construction and operation of the proposed Project will affect those washes has not been determined, but some level of mitigation will be required by the USACE. A complete assessment of the potential effects to jurisdictional waters that would be caused directly or indirectly by the proposed Project will be completed when the USACE issues a Jurisdictional Determination for the proposed Project.

3.5 NOISE

This section discusses noise regulations and standards and the existing ambient noise conditions within and adjacent to the Project site.

3.5.1 Regulatory Framework

There are no federal, state, or local laws or regulations directly regulating off-site (community) noise. The Project area is subject to the management guidance included in the Las Vegas RMP/EIS, which does not contain noise regulations or standards. Also, Nye County currently does not have noise regulations or standards.

For such circumstances, the EPA (1974) has developed and published criteria for environmental noise levels with a directive to protect public health and welfare with an adequate margin of safety. That is, EPA developed this criterion (*Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*) for use as an acceptable guideline when no other local, county, or state standard has been established. However, the EPA criterion is not meant to substitute agency regulations or standards where states and localities should use the developed criteria accordingly to their individual needs and situations.

The EPA established its criteria using the day-night average sound exposure (Ldn) metric. This metric is a 24-hour average noise level calculated by obtaining the daytime noise level from the hours of 0700 to 2200 and applies a 10 decibel (dB) penalty for the more restrictive quietest nighttime noise levels between the hours of midnight to 7:00 a.m, and 10:00 p.m. to midnight.

According to the EPA guidelines, an Ldn of 45 A-weighted decibel (dBA) indoors and 55 dBA outdoors for residential areas is identified as the maximum allowable noise level that has no effects on public health and welfare occur due to interference with speech or other activity.

These levels also would protect the vast majority of the population under most conditions against annoyance, in the absence of intrusive noises with particularly aversive content. Table 3-9 was published by the EPA and summarizes the maximum allowable noise level for specified areas.

Table 3-9 Summary of Noise Levels Identified as Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety

Effect	Level	Area
Hearing Loss	$L_{eq}(24)$ =< 70 dB	All areas
Outdoor activity interference and annoyance	Ldn =< 55 dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use
	$L_{eq}(24)$ =< 55 dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	Ldn =< 45 dB	Indoor residential areas
	$L_{eq}(24)$ =< 45 dB	Other indoor areas with human activities such as schools, etc.
L_{eq} - Equivalent Sound Level; Ldn – Day/night sound level		

The proposed Project also is governed by federal OSHA hearing conservation noise exposure regulations. These regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time to which a worker is exposed. The Federal OSHA Occupational Noise Exposure standard states:

1910.95(b)(1)

When employees are subjected to sound exceeding those listed in Table 3-10, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of Table 3-10, PPE shall be provided and used to reduce sound levels within the levels of the table.

1910.95(b)(2)

If the variations in noise level involve maxima at intervals of 1 second or less, it is to be considered continuous.

Table 3-10 Permissable Noise Exposures[1]	
Duration per day, hours	**Sound level dBA slow response**
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
¼ or less	115

[1] When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: C(1)/T(1) + C(2)/T(2) C(n)/T(n) exceeds unity, then the mixed exposure should be considered to exceed the limit value. C(n) indicates the total time of exposure at a specified noise level, and T(n) indicates the total time of exposure permitted at that level. Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

3.5.2 Data Collection Methods

Noise is generally defined as unwanted or objectionable sound. The effects of noise on people can include general annoyance; interference with speech communication; sleep disturbance; and, in the extreme, hearing impairment. An assessment of the potential for a project to result in adverse noise effects requires an evaluation of several factors. These factors include an inspection of the site's general setting (such as isolated, rural, suburban, or urban); nature of the existing ambient noise sources or activities occurring in those settings; proximity of the receptor to the existing ambient noise source or activity; time of day; and various sound-attenuating factors such as vegetation, ground absorption, topographic features, buildings, and atmospheric conditions.

Noise standards and sound measurement equipment have been designed to account for the sensitivity of human hearing to different frequencies. This is accomplished by applying "A-weighted" correction factors. This correction factor is widely applied in the industry and is known to de-emphasize the very low and very high frequencies of sound in a manner similar to the response of the human ear. The primary assumption is that the dBA is a good correlation to a human's subjective reaction to noise.

Noise is measured in units of dB on a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more "weight." The dBA scale corresponds to the sensitivity range for human hearing. Noise levels capable of being heard by humans are measured in dBA. A noise level change of 3-dBA is barely perceptible to average human hearing. A 5-dBA change in noise level, however, is clearly noticeable. A 10-dBA

change in noise level is perceived as a doubling or halving of noise loudness, while a 20-dBA change is considered a dramatic change in loudness. Table 3-11 provides typical instantaneous noise levels of common activities in dBA.

Table 3-11 Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Fly-over at 1,000 feet	100	
Gas Lawn Mower at 3 feet	90	
Diesel Truck at 50 feet, at 50 miles per hour (mph)	80	Food Blender at 3 feet Garbage Disposal at 3 feet
Noisy Urban Area, Daytime Gas Lawn Mower at 100 feet	70	Vacuum Cleaner at 10 feet
Commercial Area Heavy Traffic at 300 feet	60	Normal Speech at 3 feet
Quiet Urban Daytime	50	Large Business Office, Dishwasher in Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	30	Library
Quiet Rural Nighttime	20	Bedroom at Night, Concert Hall (Background)
	10	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

3.5.3 Existing Conditions

The Project area is located within a rural, sparsely populated area. The existing ambient noise environment in the vicinity of the Project site is mainly made up of natural sounds, vehicle noise associated with the small roadway segments, and community activity in the vicinity of the Project site, as well as noise associated with the Amargosa Valley Elementary School and over flight aircraft traffic. There are no other identified noise sources located within the vicinity of the Project site.

To confirm and document the current community ambient noise conditions at the site, two environmental noise monitors were placed on the Project site to capture the rise and fall of ambient noise conditions in the area. One noise meter was located along the eastern edge of the property and the second noise meter was placed in the center of the proposed eastern powerblock area. The noise monitors were programmed to record simultaneously in the appropriate data acquisition format for depicting the significant daily background noise levels prevalent within the area of the proposed Project site. The two 24-hour noise monitors were programmed to record continuously throughout a typical business day on Thursday, December 3, 2009; the results are shown in Table 3-12.

Table 3-12 Measured Ambient Noise Levels Over a 24-Hour Period

Position	Date	Location	24 Hour L_{EQ} (dBA)	Ldn (dBA)
1	12-3-2009	Eastern Property Line	34.5	39.7
2	12-3-2009	Eastern Power Block Area	33.0	41.4

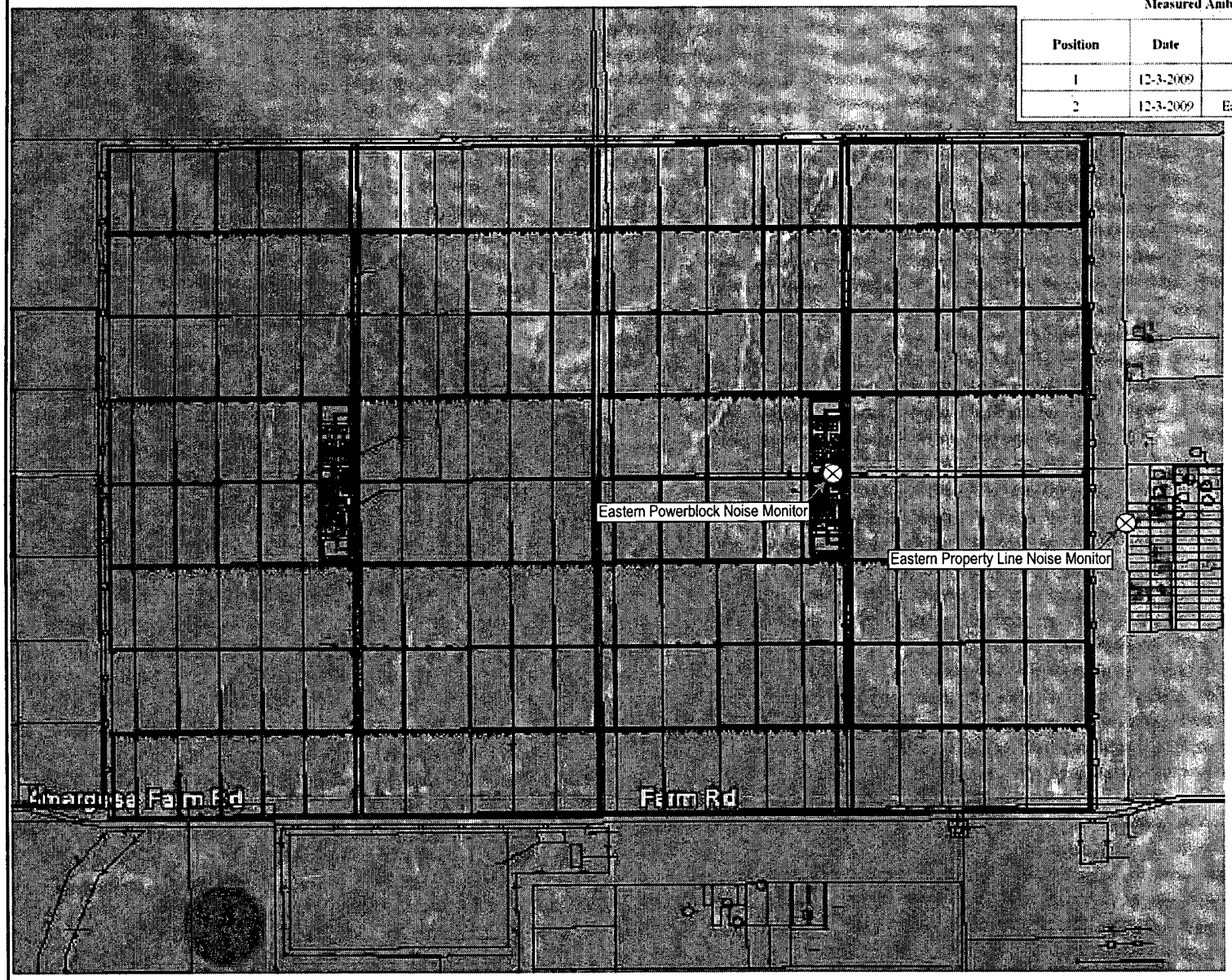
The two continuous 24-hour sound level measurements (Ldn, A-Weighted) range from a worst-case noise impact of 41.4 dBA Ldn at the center of the proposed eastern powerblock area, down to the quietest noise level of 39.7 dBA Ldn at the eastern property line. During the on-site noise measurements, start and end times were recorded as well as any significant and background noise sources in the area. The 24-hour sound level measurements ran from midnight to midnight, integrating and logging data every 30 minutes. For a graphical representation showing the two 24-hour ambient noise monitoring locations and resultant measurement values see Figure 3-10.

Other field data gathered at the site includes measuring or estimating distances, angles-of-view, slopes, and site elevations. This information is subsequently verified using available maps and records. The sound level meters were field-calibrated prior to and following the noise measurements to ensure accuracy. All sound level measurements conducted and presented in this report are in accordance with and were made using a sound level meter that conforms to the American National Standards Institute (ANSI SI.4-1983 - R2001) specifications for sound level meters. All instruments are maintained with the National Bureau of Standards traceable calibrations.

Results of any investigations or field measurements and any findings presented in this report apply solely to conditions existing at the time when the investigative work was performed. It must be recognized that any such investigative or measuring activities are inherently limited and do not represent a conclusive or complete characterization. Conditions in other parts of the Project site may vary from those at the locations where data were collected. The ability to interpret investigation results is related to the availability of the data and the extent of the investigation activities.

Measured Ambient Noise Levels over a 24 Hour Period

Position	Date	Location	24 Hour L_{eq} (dBA)	Ldn (dBA)
1	12-3-2009	Eastern Property Line	34.5	39.7
2	12-3-2009	Eastern Powerblock Area	33.0	41.4



Amargosa Farm Road Solar Energy Project
Amargosa Valley, Nevada

Global Image Showing Ambient Noise Measurement Locations and Data Results

ARCADIS

FIGURE 3-10

3.6 BIOLOGICAL RESOURCES

3.6.1 Regulatory Framework

Numerous federal and state environmental regulations and legislative acts are applicable to biological resources. Following are those which are applicable to the Proposed Action within the Project area.

3.6.1.1 Endangered Species Act of 1973

The ESA of 1973 (16 USC 1531 et seq.), as amended, provides for the conservation of federally listed plant and animal species and their habitats. The ESA directs federal agencies to conserve listed species, and imposes an affirmative duty on these agencies to ensure that their actions are not likely to jeopardize the existence of a listed species or adversely modify their habitat. Each species listed is required to have designated critical habitat. Critical habitat is the specific geographic areas that are most essential for the conservation and protection of a listed species.

3.6.1.2 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC 668) applies primarily to taking, hunting, and trading activities that involve Bald Eagles (*Halaeetus leucocephalus*) or Golden Eagles (*Aquila chrysaetos*). The act prohibits the "taking" of any individuals of these two species, as well as any part, nest, or egg. The term "take" as used in the Act includes "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb."

On July 13, 2010, the BLM issued Instructional Memorandum No. 2010-156 regarding the Bald and Golden Eagle Protection Act – Golden Eagle NEPA and Avian Protection Plan Guidance for Renewable Energy Projects. The purpose of the Instructional Memo is to provide direction for complying with the Bald and Golden Eagle Protection Act—including its implementing regulations—and to identify steps that may be necessary within the habitat of golden eagles to ensure environmentally responsible authorization and development of renewable energy resources.

For this Project, there is no anticipated take of Bald or Golden Eagles as no suitable nesting/roosting habitat is present within the Project area nor is any present within likely foraging distance.

3.6.1.3 Migratory Bird Treaty Act of 1986

The MBTA (16 USC 703) makes it unlawful to pursue, hunt, take, capture, kill, or possess any migratory bird or part, nest, or egg of such bird listed in wildlife protection treaties among the United States, Great Britain (on behalf of Canada), Mexico, Japan, and the former Soviet Republic. In addition, this act also contains a clause that prohibits baiting or poisoning of these bird species. The current list of species covered by the MBTA can be found in Title 50, CFR

Section 10.13. Because many migratory bird species occur within the Project area, the MBTA applies to those bird species that may be affected during the construction and operation of the proposed Project.

3.6.1.4 Nevada State Protection of Christmas Trees, Cacti, and Yucca

The State of Nevada has a statute for the protection of Christmas Trees, Cacti, and Yucca (NRS 527.060-527.120). Under this statute it is illegal for any individual or company to cut, destroy, mutilate, remove, or possess any Christmas tree, cactus, yucca, or portions of these plants. Additionally, it is illegal to sell any of these plants from any lands owned by or under the jurisdiction of the United States. This statute applies to any cacti or yucca on BLM-managed lands that may be affected during construction of the proposed Project.

3.6.1.5 Nevada State Protection and Propagation of Native Fauna

The State of Nevada has a statute for the protection and propagation of native fauna (NRS 503.584-503.589). The purpose of this statute is to provide for the conservation, protection, restoration, and propagation of selected species and the perpetuation of the habitats of such species. The Board of Wildlife Commissioners, under consultation with authorities, will determine which species' existence is endangered or habitat is threatened with destruction, thereby warranting protection under this statute. This statute applies to species listed by the State of Nevada that may be affected during the implementation of the proposed Project.

3.6.2 Environmental Setting

The Project area lies in the Amargosa Valley in Nye County, Nevada, between the Yucca Mountains to the north and the Funeral Mountains to the southwest. The proposed Project is located in the Northern Mojave Desert Ecoregion which encompasses the southern tip of Nevada and extends into Arizona, California, and Utah. This ecoregion is a transitional region between the higher and cooler Great Basin Desert to the north and the warmer Sonoran Desert to the south (Webb et al. 2009), featuring basin and range topography, with broad valleys separated by rugged mountain ranges. This ecoregion is dominated by Mojave Desert scrub, which is intermediate between the Great Basin Desert scrub and the Sonoran Desert scrub habitats. Elevation in the region ranges from approximately 450 to more than 8,000 feet, averaging 2,770 feet. Precipitation in this ecoregion ranges from approximately 5 to 11 inches per year, with slightly more winter than summer precipitation.

The Amargosa Valley averages 4.2 inches of rain annually, with annual extremes of anywhere from less than half an inch (0.45 inch in 2002) to more than 10 inches (10.4 inches in 1983) (Western Regional Climate Center, Amargosa Farms Garey, Nevada [Station 260150]). The Project area is characterized as creosote desert scrub, dominated by creosote bush (*Larrea tridentata*). It is a typical dry region of Mojave Desert, with relatively sparse shrub canopy and very little annual herbaceous growth except during wet years. The topography of the Project area is uniform with a few small, shallow washes that cross the site from north to south. The largest of these washes is Fortymile Wash that connects to the Amargosa River.

3.6.3 Data Collection Methods

A biological inventory of the Project area was conducted utilizing scientific literature, satellite imagery, agency contacts, and biological resource field surveys. Data were collected by Tierra Data, Inc. in the Project area in the spring and summer of 2009. Agency personnel were asked to provide information on potential or known occurrences of sensitive species of wildlife and plants and on habitats of special concern within the Project area and ROI. The following agencies were contacted for information: BLM, USFWS, and NDOW.

Data were collected and digitized into GIS format for:

- vegetation communities
- species listed as federally threatened, endangered, or as candidates under review for listing
- species classified as rare, sensitive, or otherwise protected by the State of Nevada
- areas of special biological value or interest, including riparian and wetland habitats

The report entitled "*Biological Resources Surveys for Amargosa Farm Road Solar Project*" (Tierra Data 2009) contains detailed information on the vegetation and wildlife resources inventoried. The results of the biological resources inventory are summarized below.

3.6.4 Vegetation

3.6.4.1 Vegetation Communities within the Region of Influence and Project Area

The ROI for botanical resources, including threatened, endangered, proposed, and candidate plant species, consists of areas that may be affected by permanent and temporary features of the Proposed Action and areas that may be impacted groundwater withdrawal. The extent of the ROI for botanical resources is based on the effects on surface and groundwater hydrology discussed in the analysis provided in Water Resources-Section 3.4 of this document. Based on these criteria, the ROI for direct impacts on botanical resources includes those areas in the immediate vicinity of the Proposed Action construction, operation, and maintenance activities. The ROI for indirect effects is the Amargosa Desert Hydrographic Basin #230.

The majority of the Project area is characterized as desert flats with Mojave creosote scrub (Holland code 34100; Hartman 2002) as the sole dominant community type. This community type is dominated by creosote bush, either as the sole dominant or co-dominant, with one or more other shrub species. Burrobush is the most typical co-dominant, followed by saltbush (*Atriplex* spp.) in more alkaline soils. The shrubs range from 1.5 to 9 feet tall, are widely spaced, and generally the ground between shrubs is essentially barren or contains very sparse forbs and grasses (Hartman et al. 2002). Growth occurs during spring (rarely in summer or fall) if rainfall is sufficient. Cold winters and droughts in other seasons can limit plant growth. Many herbaceous ephemeral species may flower in late March and April if winter rains are sufficient. Summer thundershowers can also trigger growth in these ephemeral species.

The soils where creosote scrub occurs are characterized as well-drained soils with very low available water holding capacity (Hartman 2002). They occur on slopes, alluvial fans, and valleys. Winter nighttime temperatures are often below freezing in these areas.

Creosote scrub is extensive and characteristic of the Mojave Desert, extending from the Death Valley region southward and across the Mojave Desert to the San Bernardino Mountains, and eastward to northwestern Arizona and southern Nevada (Hartman 2002).

A number of shallow ephemeral washes cross the western half of the Project area flowing from north to south; however, none have desert riparian trees typical of deset washes in more mesic regions, such as desert willow (*Chilopsis linearis*) or catclaw acacia (*Acacia greggii*). The washes in the Project are mainly unvegetated, or have a sparse shrub assemblage composed primarily of the surrounding desert flats. A few individuals of cheesebush (*Hymenoclea salsola*), a shrub species typical of desert washes elsewhere, do occur, but are sparse and widely scattered. In some places, the washes have well-developed banks, especially Fortymile Wash. Along the banks it is more common to see desert saltbush (*Atriplex polycarpa*) than in the uplands away from the banks.

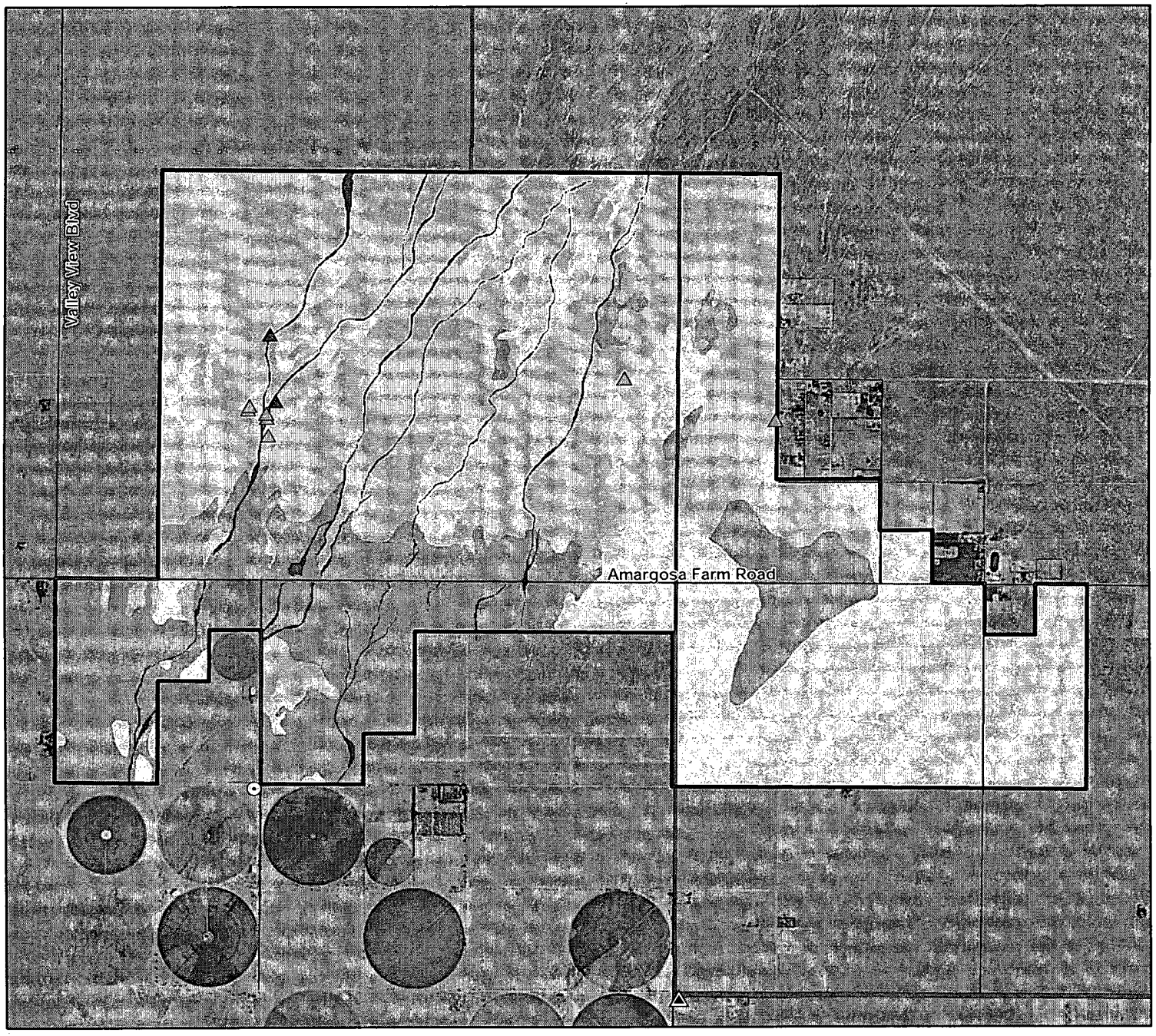
3.6.4.2 General Vegetation Conditions within Project Area

The vegetation within the Project area is generally very sparse and dominated by creosote bush and burrobush (*Ambrosia dumosa*), with very little herbaceous growth; most of which is confined to the shrub canopies or just a short distance beyond (Figure 3-11). Between shrubs the surface is mostly barren, desert pavement with a widely scattered growth of a few forb and grass species, primarily cryptantha (*Cryptantha* spp.), goldfields (*Lasthenia californica*), and devils spineflower (*Chorizanthe rigida*).

The relative proportions of these annuals tended to shift from mostly Cryptantha and Schismus in areas of creosote bush-burrobush, to more Chorizanthe in areas dominated solely by creosote bush. Other forb species common on-site were various annual buckwheat species (e.g., flat-topped buckwheat [*Eriogonum deflexum*], Thomas' buckwheat [*Eriogonum thomasii*]), several species of the primrose (Onagraceae) family (e.g., devils lantern [*Oenothera deltoides*], Booth's evening primrose [*Camissonia boothii*]), and annual mustard species (none could be identified in 2009 since the only evidence observed was the remnants of previous years' growth, which lacked the identifiable structures necessary to identify the species). Other annual species documented in the species list compiled for this Project were scarce, occurring mostly as widely scattered individual plants.

Cacti found within the Project area are represented by just two species; golden cholla (*Cylindropuntia echinocarpa*) and beavertail pricklypear (*Opuntia basilaris* var. *basilaris*). Only seven cholla and two beavertail were found. All cacti, with the exception of two, were located in a small area in the northwestern quadrant of the Project site (Figure 3-11).

The washes located within the Project area are little more than shallow swales, with no riparian vegetation.



Amargosa Farm Road Solar Energy Project (NVN-84359)

Vegetation
Figure 3-11

LEGEND

Project Area

Vegetation Association

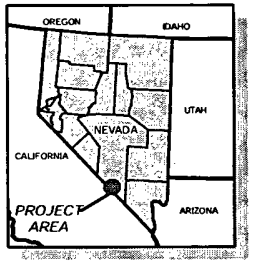
- Creosote Bush
- Creosote Bush - Allysum
- Creosote Bush - Bursage
- Creosote Bush - Bursage - Saltbush
- Creosote Bush - Saltbush
- Sparse, wash

Cactus Species Detected

- Golden Cholla *(Cylindropuntia echinocarpa)*
- Beavertail Prickly Pear *(Opuntia basilaris)*

General Reference Features

- Proposed Project Well
- Existing Substation
- Local Road
- Existing Transmission Line (<230kV)



Source: Vegetation, Species - TierraData, 2009;
Wells - Nevada State Engineer, 2008;
Local Roads - TerraSpectra, 2009;
Imagery - ESRI, 2009

September 2010

0 0.4 0.8 Miles

3.6.4.3 Non-native and Invasive Plants

Plant surveys conducted in spring 2009 found 8 species that are not native and may be invasive to the area (Table 3-13) (Tierra Data 2009).

Table 3-13 Non-native and Invasive Plants within the Project Area

Scientific Name	Common Name
Bromus madritensis ssp. *rubens*	red brome
Datura stramonium	jimson weed
Erodium cicutarium	redstem stork's bill
Salsola sp.	Russian thistle
Salsola tragus	spiny Russian thistle
Schismus barbatus	Mediterranean grass
Sisymbrium irio	London rocket
Tamarix aphylla	athel tamarisk

Red brome

Red brome (*Bromus madritensis* ssp. *rubens*) is the most widely scattered non-native grass species in the area, and is one of the most invasive because, once established, it becomes competitive with other grasses. The tolerance of this subspecies to high salt and high pH conditions partially explains its success in desert soils, but control may be possible by reducing seed production and increasing competition from native herbaceous plants.

Jimson weed

Jimson weed (*Datura stramonium*) is commonly found on dry rangelands and waste places, and was found scarcely scattered in the Project area. The seeds of this plant can lie dormant underground and germinate when the soil is disturbed.

Redstem stork's bill

Redstem stork's bill (*Erodium cicutarium)*, also known as filaree, is a widespread annual species common in disturbed habitats. It has the capacity to form dense, transient populations when conditions are suitable.

Russian thistle

Russian thistle (*Salsola* sp.) is especially troublesome because it is very difficult to control once it becomes established. It is a common invader on disturbed sites and is extremely drought

tolerant, the taproot extends several feet into the soil to reach subsurface moisture. The numerous seeds are spread when mature plants are blown along by the wind. A few patches of spiny Russian thistle (S. *tragus*) were present, some of which consisted of numerous individuals and seedlings. The populations ranged from a few plants to greater than 20 plants. All individuals were located near roads, generally no more than 60 feet from the road edges. Control of Russian thistle is difficult. Biological agents were introduced in the 1970s, with little success.

Mediterranean grass

Mediterranean grass (*Schismus barbatus*) is common in agricultural and urban areas, occurring along roadsides, in cultivated fields, and other disturbed areas, although it can occur in undisturbed habitats as well, especially along river bottoms, plains, and hillsides in desertscrub. Activities that disturb the soil and reduce groundcover contribute to its spread. Mediterranean grass is commonly found in the spaces between shrubs, often producing a carpet of green that turns purplish at maturity and fades to a light straw color soon after death.

London rocket

London rocket (*Sisymbrium irio*) is abundant and widespread throughout North America, and appears to thrive along roadsides, waste places, and irrigated lands. It is one of the first weeds to appear in the winter, and because it is a prolific seeder, can be a troublesome invader.

Athel tamarisk

Various Tamarix species are listed as noxious weeds in Nevada; however, athel tamarisk (*Tamarix aphylla*), which was found in the Project area, is not regarded as weedy, nor is it considered an aggressive invader. All individuals were found near roads where they were planted in several locations around residential structures in adjacent neighborhoods; however, some of the individuals growing along roadsides were located within the Project boundary.

3.6.4.4 Federally Threatened, Endangered, Proposed, and Candidate Plant Species

No federally threatened, endangered, proposed, or candidate plant species were located during surveys of the Project area. However, the USFWS identified several threatened and endangered plant species with the potential of occurring within the ROI. Table 3-14 lists these species and identifies corresponding protection status for the BLM and the State of Nevada.

Table 3-14 Endangered and Threatened Plant Species that May Occur within the Region of Influence

Scientific Name	Common Name	Habitat	Endangered Species Act	State of Nevada	BLM
Nitrophila mohavensis	Amargosa Niterwort	Carson Slough – highly alkaline, moist, salt-encrusted soils	Endangered	Endangered	Sensitive
Astragalus phoenix	Ash Meadows Milkvetch	Ash Meadows – hard, white, alkaline clay soils	Threatened	Endangered	Sensitive
Centaurium namophilum	Spring-loving Centaury	Ash Meadows – seasonally flooded wetlands, moist alkali meadows, and edges of some scrub-shrub communities	Threatened	Endangered	Sensitive
Enceliopsis naudicaulis var. corrugata	Ash Meadows Sunray	Ash Meadows – dry washes and weathered saline soils	Threatened	Endangered	Sensitive
Grindelia fraxinopratensis	Ash Meadows Gumplant	Ash Meadows – ash-screwbean mesquite woodlands and desert shadscale scrub vegetation	Threatened	Endangered	Sensitive
Ivesia eremica	Ash Meadows Ivesia	Ash Meadows – highly alkaline, clay lowlands or depressions where soil moisture remains high	Threatened	Endangered	Sensitive
Mentzelia leucophylla	Ash Meadows Blazing Star	Ash Meadows – upland alkaline soils found in arroyos and on knolls	Threatened	Endangered	Sensitive

All federally endangered and threatened plant species assessed in this document are endemic to the Ash Meadows NWR area. Ash Meadows NWR is home to 25 species of plants and animals found nowhere else in the world and are highly dependent upon available water (USFWS 1990). The Project area is located approximately 7 miles northwest of the edge of the Ash Meadows NWR, which is located within the ROI.

Amargosa Niterwort

Regulatory Status

The Amargosa niterwort (*Nitrophila mohavensis*) was first proposed endangered under the ESA on October 13, 1983 with six other rare plants and one insect species in Ash Meadows, Nevada and California (48 FR 46590-46598). It was finally listed as Endangered with designated critical habitat on May 20, 1985 (50 FR 20777-20794). The plant was included in a recovery plan at Ash Meadows with 11 other federally listed species in 1990 (USFWS 1990). In addition to federal

protection, it is fully protected in Nevada, is a BLM Special Status Species in Nevada, and is considered endangered by the Nevada Native Plant Society (NNHP 2001). Designated critical habitat is located in Inyo County, California, approximately two miles northeast of the Amargosa River along Ash Meadows Road, approximately 0.75 miles south of the California-Nevada state line (USFWS 1990).

Species Description

The Amargosa niterwort was first collected by J.C. and A.R. Roos in 1955 (50 FR 20777-20794) and described by Munz and J.C. Roos in 1955 (48 FR 46590-46598; 50 FR 20777-20794). This small, 4-inch tall perennial herbaceous plant is a member of the goosefoot family, that comprises a group of herbs or shrubs that are often succulent or scurfy, and often weedy and frequently of saline or subsaline places (Munz 1974). The characteristic which identifies *Nitrophila* from other genera is the presence of sepals, that are strongly imbricate, scarcely united, and strongly chartaceous. The leaves are opposite and united at the base (Munz 1974). The Amargosa niterwort is one of two species included in the *Nitrophila* genus, and is identified by its 5-8 centimeter stems that are erect from extensive heavy underground root-stocks, round-ovate leaves, small, inconspicuous pink flowers and shiny black seeds (Munz 1974). *N. mohavensis* appears to be restricted to heavy alkaline mud in habitats at approximately 2,050 feet in elevation.

Status and Distribution

The Amargosa niterwort occurs in colonies of individuals linked by their large, rhizomatous roots in highly alkaline, moist, salt-encrusted clay soils within the southern portion of Carson Slough in Nevada and California. Carson Slough is a large and extensive marsh into which the waters from Fairbanks Spring drain, but has been obliterated due to the present large-scale exploitation of water resources for agricultural purposes. Only a few remnants of the marshland and its vegetation are known to exist today. The Carson Slough was not botanically surveyed prior to its destruction and there is no basis upon which to judge how many rare or possibly endemic species may have been lost (Conservation Management Institute [CMI] 1996).

When the species was listed in 1985, it was known from one location, the type locality, in the southern end of Carson Slough, approximately three miles northeast of Death Valley Junction, California (Beatley 1977; USFWS 2007a). Since the listing in 1985, five additional populations have been documented, totaling six populations; two in California and four in Nevada. In Nevada, populations were found at Crystal Reservoir, Central Carson Slough 1 on the NWR boundary line, Central Carson Slough 2 outside of the NWR, and the NWR West Entrance, north and south side of Spring Meadows Road. During surveys conducted by USFWS and USGS in 2005 and 2006, the species was found at five of the six known locations. During surveys conducted at the NWR West Entrance in 2006 resulted in no plants found. Currently, this population is likely extirpated from the location (USFWS 2007a). The most important *Nitrophila mohavensis* population is located in the Lower Carson Slough in California, but the Crystal Reservoir population in Nevada represents the second most important population for the species. According to the USFWS (2007a), the size and extent of the Crystal Reservoir population is not well characterized, but it appears to be the second most important population with respect to the

number of ramets observed. Ramets are the above-ground stems, that are the most visible to the naked eye, but they may not represent true numbers of plants because they reproduce underground as rhizomes, along which multiple ramets emerge.

The population at Crystal Reservoir occupies larger acreage than at Lower Carson Slough, but the population is smaller and less dense. In a 2005 survey conducted by Caicco (2005), the niterwort occupied approximately 25-30 acres. The remaining populations of niterwort in Nevada and California represent approximately two percent of the known distribution of ramets (USFWS 2007a). Based on available data, according to USFWS, the Lower Carson Slough population may be declining due to the species' inability to recover from impacts resulting from development activities (e.g., peat mining, water diversions, and groundwater pumping associated with large-scale farming in the NWR and Upper Carson Slough during the 1950s and 1960s). It also appears the extent of the Lower Carson Slough and Tecopa populations are also decreasing. According to the USFWS (2007a), little or no data are available to suggest trends for the populations at Tecopa and the NWR West Entrance.

Life History

There is little known about the life history of Amargosa niterwort, but it is known to be a long-lived perennial, reproducing underground. Its presence appears to be limited to areas that are highly alkaline in moist salt-encrusted clay soils. Observations indicate it is an extremely hardy plant that is tolerant of high soil salinity and alkalinity, and because of this, few other plant species occupy the habitat where it grows (USFWS 1990). Large rhizomatous roots connect many seemingly individual plants within a colony. Flowering occurs in late spring (NNHP 2001).

The niterwort is confined to specific habitat that is restricted to extremely local areas within or near the Carson Slough, where saline and alkaline sinks occur near the terminuses of seepage from springs that lie many miles to the north and east in Ash Meadows (50 FR 20777-20794).

Ash Meadows is a fragile ecosystem dependent on water, which enters a vast underground aquifer system. The water is known as fossil water because it takes thousands of years to move through the ground. The fault system blocks the flow of water, forcing it to the surface into 30 seeps and springs (Desert Gazette 2009). The hydrological and soil conditions at these sites make them uniquely suitable for Amargosa niterwort. Little is known regarding the subsurface flows in the Central and Lower Carson Slough that currently support the majority of the niterwort. A groundwater study conducted by Rowley in 2003, determined that groundwater entering Lower Carson Slough comes from three or four flow paths within the Death Valley Flow system that includes Ash Meadows subbasin and/or Alkali Flat Furnace Creek Ranch subbasin (Rowley 2003).

Threats to the Species

A significant portion of plant habitat in Ash Meadows was eliminated in the 1960s when Carson Slough was drained to facilitate peat mining, then large scale farming shortly thereafter. Even though Amargosa niterwort habitat was not plowed, free-flowing water to its habitat was halted by upstream plowing and reduction of spring flows resulting from groundwater pumping (48 FR

46590-46598). According to Reveal (1978), Amargosa niterwort is sensitive to disturbance and does not reestablish itself at sites where salt crust overlying the soil has been disturbed. The Nevada population lies in a remote area where the disturbance has been limited to trampling by wild horses and soil compaction by OHVs (USFWS 1990).

Throughout the species' range, three major threats have been identified by USFWS (2007a): (1) Ecosystem-based alteration, particularly habitat loss by changes in groundwater availability, (2) direct and indirect impacts resulting from surface mining, and (3) direct and indirect impacts resulting from raised construction of Ash Meadows Road. Currently, three of the four Nevada population sites face the threat of interruption of water supply to habitat. The fourth site at Crystal Reservoir, appears to be secure from the threat. Impacts to the niterwort due to groundwater pumping may not be immediately evident. Slow population declines can take years and trends may be masked by other factors such as annual variations in precipitation (USFWS 2007a). The Project area is located approximately 7 miles northwest of the Ash Meadows NWR within the adjacent Alkali Flat/Furnace Creek hydrologic subbasin; however, none of the Nevada population sites are within this subbasin (USFWS 2007a). Given the proximity and predicted flow paths, the Central and Lower Carson Slough populations of Amargosa niterwort likely receive water from both the Ash Meadows and Alkali Flat hydrologic subbasins (USGS 2002). The hydrology that supports the Crystal Reservoir population is poorly understood because at the time the Reservoir was constructed in 1970s, it was unknown whether the niterwort already existed there (USFWS 2007a).

The second major threat to all Ash Meadows species, including Amargosa niterwort, is habitat loss or degradation from surface mining. Mining directly and indirectly threatened the Lower Carson Slough population in California, and the four niterwort populations on the Ash Meadows NWR, which are on BLM and USFWS lands with public minerals. The third threat is from habitat degradation from construction of Ash Meadows Road. In late 1999 and early 2000, the California Department of Transportation improved Ash Meadows Road where it crossed the Lower Carson Slough and Amargosa niterwort habitat. California Department of Transportation raised the roadbed, which altered sedimentation patterns in the Carson Slough during thunderstorms or rare high flow events (USFWS 2007a). Other threats to the niterwort include trampling by wild horses and OHV activity, invasive species and fire, and damage to Crystal Spring Dam.

Species in the Project Area

The Project area is located approximately 12 miles northwest of the nearest known locations of the species in near Crystal Reservoir at Ash Meadows NWR. The plant has never been found within the Project area, although the plant populations at Ash Meadows share some groundwater-related commonalities with the Project area. The Ash Meadows Basin (includes most of Ash Meadows NWR) and Alkali Flat-Furnace Creek Basin (includes the Project area and a small portion of Ash Meadows NWR) are connected by the Central Death Valley subregion of the DVRFS.

Ash Meadows Blazing Star

Regulatory Status

The Ash Meadows blazing star (*Mentzelia leucophylla*) was listed as threatened with designated critical habitat on May 20, 1985 (50 FR 20777-20794). The plant was included in a recovery plan at Ash Meadows with 11 other federally listed species in 1990 (USFWS 1990). In addition to federal protection, it is fully protected in Nevada, is a BLM Special Status Species in Nevada, and is considered threatened by the Nevada Native Plant Society (NNHP 2001). Critical habitat consists of 1,240 acres in Ash Meadows at four locations; two along and just east of Carson Slough and two east of Carson Slough in close proximity to Devils Hole (50 FR 20777-20794).

Species Description

The Ash Meadows blazing star (*Mentzelia leucophylla*) was first collected in 1898 by Carl Purpus, and described by Brandegree in 1899 (USFWS 1990). Initially, the plant collected by Purpus was included with *M. oreophila* as a single species by Darlington in 1934 and Abrams in 1951. The reverse synonomy was published by Jepson in 1936 and Munz and Keck in 1959. Taxonomy of the species was in question until the issue was resolved in a status report completed by Reveal in 1977.

This small biennial or short-lived perennial is a member of the stick-leaf (blazing star) family that is comprised of a group of herbs that are pubescent with barbed or sometimes stinging hairs. The characteristics which most readily identifies *Mentzelia* from other genera is the presence of three placentae, seeds that are 1-4 millimeters, white to golden yellow flowers, and never with stinging hairs (Munz 1974). *M. leucophylla* has leaves that are densely covered with white hairs (NNHP 2001). Flowers are few, small, opening only briefly from May to September. In addition, the stems are covered with an epidermis that peels in long segments. Leaves are mainly basal, linear-oblong, 6-8 centimeters long, 1 centimeter wide, rigid, densely tomentose with strongly revolute margins. The seeds are flat and narrowly margined (Knight and Clemmer 1987).

Status and Distribution

The Ash Meadows blazing star occurs exclusively in Nye County, and is endemic to Ash Meadows. The local distribution of small populations suggests the species is extremely vulnerable to any land disturbance (USFWS 1990). It has been suggested that past development for agriculture is believed to have eliminated some populations within their range (Reveal 1978). Few individuals occur at any one site, with fewer than 200 individuals estimated on the refuge; however, because the species blends in well with the landscape, plants may be missed during surveys. Currently, four populations occur in Nevada, all of which are within designated critical habitat. They include (1) Purgatory Spring, (2) Old Rooker Ranch-Cold Spring, (3) North County Road, and (4) Marsh to Bradford springs (Knight and Clemmer 1987).

Life History

Mentzelia leucophylla is a small biennial or short-lived plant that occurs only in Ash Meadows, in clay soils of spring areas, especially along canyon washes where *Atriplex* is common, at

elevations ranging from 2,200-2,300 feet amsl (Beatley 1976). Mozingo and Williams (1980) suggests, in addition to clay soils, it also occurs in sandy or saline clay soils in plant communities dominated by, *Atriplex confertifolia*, *Haplopappus acradenius*, *Cryptantha confertiflora*, *Enceliopsis nudicaulis* var. *corrugata*, and *Astragalus phoenix*, at elevations 2,200-6,500 feet amsl. The USFWS suggests that the species is associated with upland alkaline soils found in arroyos and on knolls only within the more xeric portions of Ash Meadows (50 FR 20777-20794). However, this uncommon plant is often found with Ash Meadows milkvetch and Ash Meadows sunray. According to the USFWS (1990), the Ash Meadows blazing star is probably the rarest of all plant species endemic to Ash Meadows. Although little is known about its life history or habitat requirements, it is known to occupy alkaline soils in dry washes and on barren bluffs distributed along the eastern edge of Ash Meadows. Bright yellow flowers bloom from late May into September and are open only for brief periods in late afternoon (NNHP 2001).

Threats to the Species

According to USFWS (50 FR 20777-20794):

> "Existing populations have been greatly reduced from those known to have occurred 15 years ago by habitat disturbance during road construction, cropland development, and peat mining in Carson Slough. Threats to its existence include alteration of storm drainage patterns through arroyos by road construction, habitat destruction in locations where road construction activities are proposed, and the trampling by wild and free-roaming horses."

The blazing star is narrowly confined to a spring-fed desert wetland area with extreme saline soils. Eight sites are known in Nevada, which are threatened by development. Agricultural development and the associated large-scale exploitation of the region's water resources have destroyed large portions of the local native flora (NatureServe 2009).

The local distribution of small populations suggests the species is vulnerable to any level of disturbance. In addition to trampling by wild and free-roaming horses and agricultural development, USFWS (1990) also suggests trampling by other livestock and disturbance caused by OHV travel as major threats to these small, fragile populations.

Species in the Project Area

The Project area is located approximately 9 miles northwest of the nearest known locations of the species in Nevada at Ash Meadows and Carson Slough. The plant has never been found within the Project area, although the plant populations at Ash Meadows share some groundwater-related commonalities with the Project area. The Ash Meadows Basin (includes most of Ash Meadows NWR) and Alkali Flat-Furnace Creek Basin (includes the Project area and a small portion of Ash Meadows NWR) are connected by the Central Death Valley subregion of the DVRFS.

Ash Meadows Gumplant

Regulatory Status

The Ash Meadows gumplant (*Grindelia fraxino-pratensis*) was listed as threatened with designated 1,968 acres of designated critical habitat for the species under the ESA on May 20, 1985 (50 FR 20777-20794). The plant was included in a recovery plan at Ash Meadows with 11 other federally listed species in 1990 (USFWS 1990). In addition to federal protection, it is fully protected in Nevada, is a BLM Special Status Species in Nevada, and is considered endangered by the Nevada Native Plant Society (NNHP 2001). Designated critical habitat is located in Inyo County, California and Nye County, Nevada, at 11 locations east of Carson Slough, and one site on the west side of the Slough (USFWS 1990).

Species Description

The Ash Meadows gumplant was first collected in 1965 by Beatley, and described by Reveal and Beatley in 1971 (50 FR 20777-20794). This tall (70-100 centimeters) biennial (or short-lived perennial) herbaceous plant is a member of the sunflower family, the largest family of vascular plants, with possible 950 genera and 20,000 species, chiefly herbaceous, and world-wide in distribution (Munz 1974). There are one to three stems arising from a woody root-stock. The stems are glabrous, leafy, and openly branched in their upper halves. The leaves are leathery, dark green, and dotted with resinous glands. Basal leaves are oblanceolate and 4 to 7 centimeters long while the stem leaves are oblanceolate to oblong and 1.5 to 5.0 centimeters long. The leaf edge is entirely to somewhat toothed at the apex (Mozingo and Williams 1980).

Status and Distribution

The Ash Meadows gumplant is endemic to the Ash Meadows area in Nye County, Nevada and Inyo County, California, and is concentrated in three main populations and several smaller ones, covering approximately 2,260 acres (BLM and USFWS 2000a), mostly within the boundaries of the Ash Meadows NWR, but one population occurs outside the wildlife refuge, but within the Ash Meadows ACEC managed by the BLM. This large population extends approximately one mile into Inyo County, California. Most of the populations were surveyed in 1998, and plants were confirmed at all sites identified in 1985; however a few small populations on private lands were not surveyed and six new sites were discovered during the 1998 surveys (Glenne 1998; Alexander 1998). Based on survey history, it appears the gumplant has increased its distribution since the species was listed in 1985, probably due to the conversion of some agricultural lands back to a natural state, and the species ability to recover in disturbed habitats (USFWS 2007b; Mozingo and Williams 1980).

According to USFWS (2007b), there is little quantitative or demographic data to describe trends for the Ash Meadows gumplant. In 2000, the entire population, based on visual estimates of 81,000 plants, was likely a serious underestimate of the total number of plants actually present. A 2002 survey conducted in California found approximately 241,514 (+ or – 69,660) plants on 88 acres.

Life History

The Ash Meadows gumplant is a biennial or short-lived perennial that occurs generally in moist saltgrass flats and near stringer washes and pools with high water table, at elevations ranging from 2,070 to 2,320 feet amsl (Center for Biological Diversity 2009). It has been associated with ash-screwbean mesquite woodlands and desert shadscale scrub vegetation. It occasionally occurs on open alkali clay soils in drier shadscale habitats (BLM 2009a). According to the NNHP (2001), the gumplant occurs in open, flat, whitish, strongly alkaline, moist and hard to sometimes dry and powdery clay soils in or bordering meadows and shallow drainages near springs and seeps. It sometimes occurs in disturbed and somewhat weedy areas in creosote bush-bursage and shadscale zones in ash-mesquite woodlands, shadscale scrub, or saltgrass meadows with *Prosopis* spp., *Fraxinus* spp., *Atriplex confertifolia*, *Centaurium namophilum*, *Distichlis spicata*, *Sporobolus airoides*, *Baccharis emoryi*, *Iva acerosa*, *Tamarix ramosissima*, and *Cirsium mohavense*. Best population development is on moist intact soils (Knight and Clemmer 1987). The meadow ecosystem occupied by Ash Meadows gumplant is also commonly associated with spring-loving centaury (*Centaurium namophilum*), yerba mansa (*Anemopsis californica*), western niterwort (*Nitrophila occidentalis*), and California loosestrife (*Lythrum californicum*). Additional species associated with the gumplant in shadscale scrub include desert isocoma (*Isocoma acradenius*), alkali rabbitbrush (*Chrysothamnus albidus*), and sealight (*Saueda* spp.) (Cochrane 1981).

New leaves of the gumplant start growing in June or July, and budding occurs from July through August. Beginning in June, the plant produces daisy-like bright yellow flowers, with fruit produced in early October. The seeds are very light and can be blown by the wind for a long distance. Seeds that fall near the parent plant may also be transported by water during winter rains or summer flash floods. Mammals, birds, and ants may also aid in seed dispersal. The germination date of seeds is unknown (Center for Biological Diversity 2009).

Threats to the Species

Throughout the species' range, three major threats have been identified by USFWS (2007b): (1) Loss of habitat from groundwater pumping; (2) invasive non-native species; and (3) surface mining. During the 1985 final rule to list the Ash Meadows gumplant, interruption of water supply was identified as a major threat to the species. This threat continues today as groundwater pumping occurs on a regional scale, particularly from the Alkali Flat/Furnace Creek Ranch hydrologic basin in Amargosa Valley, at approximately two times the rate predicted to be sustainable (USGS 2005). The NPS has indicated that the number of water rights issued by the State of Nevada for Amargosa Valley has grossly exceeded sustainable levels and the resource is over-allocated (Baldino 2006).

The second largest threat to the Ash Meadows gumplant, and all native flora, is the infestation and establishment of non-native species. According to Pimental et al. (2005), approximately 42 percent of all threatened and endangered species in the U.S. are at risk because of non-native species. Because agricultural land is common throughout the area, noxious weeds commonly associated with agriculture include Russian knapweed (*Acroptilon repens*), five hook bassia (*Bassia hyssopifolia*), Malta star thistle (*Centaurea melitensis*), yellow star thistle (*Centaurea solstitialis*), and hoary cress (*Cardaria draba*) (USFWS 2006a). The weeds directly compete

with native species for water, nutrients, and sunlight, and alter ecosystem processes such as nutrient cycling and fire regime. The adaptations of noxious weeds present on the Ash Meadows NWR allow them to out-complete native flora and colonize undisturbed habitat (USFWS 2007b). The wet meadows are particularly vulnerable to invasion by noxious weeds because it provides favorable conditions to invade sites that are occupied by the gumplant. The agricultural fields adjacent to large populations of Ash Meadows gumplant are infested with Russian knapweed, bassia, and Malta star thistle (USFWS 2007b).

Fire facilitated by non-native species is a threat that was not identified in the 1985 listing document. Where weeds are present, anecdotal observations suggest fire appears to provide an opportunity for non-native plants to expand on the wildlife refuge where most of the gumplant exists. Because weeds alter fire regimes by increasing the ease with which fires spread through riparian corridors and along spring channels, they destroy native plants and their habitats. The hardier non-natives typically prevent regrowth and colonization of native plants after fires, causing reduction in native plant cover and diversity (USFWS 2007b).

Surface mining has remained a threat to the Ash Meadows gumplant since it was listed in 1985. Direct impacts to the plant as result of mining include loss of habitat. Indirect impacts are caused by diverting or draining water away from its habitat during mining operations (USFWS 2007b). However, there are plans to withdraw BLM and USFWS lands with public minerals, so the threat caused by surface mining is looking more optimistic for the species. Other threats to the gumplant include trampling by cattle and wild horses, OHV activity, and potential stochastic and natural catastrophic events (USFWS 2007b).

Species in the Project Area

The Project area is located approximately 11 miles northwest of nearest known locations of the species within or adjacent to the Ash Meadows NWR. The plant has never been found within the Project area, although the plant populations at Ash Meadows share some groundwater-related commonalities with the Project area. The Ash Meadows Basin (includes most of Ash Meadows NWR) and Alkali Flat-Furnace Creek Basin (includes the Project area and a small portion of Ash Meadows NWR) are connected by the Central Death Valley subregion of the DVRFS.

Ash Meadows Ivesia

Regulatory Status

The Ash Meadows ivesia (*Ivesia eremica*[=*I. kingii var. eremica*]) was listed as threatened with designated critical habitat under the ESA on May 20, 1985 (50 FR 20777-20794). The plant was included in a recovery plan at Ash Meadows with 11 other federally listed species in 1990 (USFWS 1990). In addition to federal protection, it is fully protected in Nevada, is a BLM Special Status Species in Nevada, and is considered threatened by the Nevada Native Plant Society (NNHP 2001). Designated critical habitat is located at five general locations east of Carson Slough (large and extensive marsh) in Nye County, Nevada (50 FR 20777-20794).

Species Description

The Ash Meadows ivesia (*Ivesia eremica[=I. kingii var. eremica]*) was first discovered by Coville and Funston on March 2, 1891 near Watkins Ranch, south of Devils Hole in north Ash Meadows, Nye County, Nevada (Beatley 1976; Knight and Clemmer 1987). It was originally described as *Potentilla eremica* in 1892, because remains of spent flowers were collected in mid-winter and was thought to be *P. santolinoides*, but was later changed to *Ivesia eremica.* Coville and Funston found *Ivesia* only in one location east of Watkins/Collins Ranch in an alkaline limestone marsh with *Spartina gracilis*, *Anemopsis californica*, and *Schoenus nigricans* (Beatley 1977). As of 1987, the taxonomy of the species and genus has been controversial. The *Horckelia-Ivesia-Potentialla* complex went through revision, and *Ivesia eremica* became the accepted name of the plant, although some botanists question whether this taxon is distinctive enough to be maintained as a discrete variety of the species *I. kingii.* The species as a whole is extremely variable and somewhat rare (NNHP 2001).

This tall, prostrate perennial herb is a member of the rose family. It grows from an erect thick woody root that bears a basal tuft of grayish pubescent leaves. The leaves are pinnately compound with 60 pairs of overlapping leaflets covered with fine hairs (Knight and Clemmer 1987). Flowering stems are about 9 centimeters long and bear white flowers from August to October (NNHP 2001). Plants occur as solitary clumps not exceeding 4.8 centimeters high and 25 centimeters in diameter (USFWS 1990).

Status and Distribution

As of 1987, seven populations were located in Ash Meadows. They included: (1) Old Rooker Ranch; (2) Shaft-Chalk springs; (3) Mary Scott-Indian-School-Crystal Pool springs; (4) Crystal Pool/Amargosa Reservoir; (5) Collins Ranch; (6) Bluffs west of County Road; and (7) Tubbs-Love ranches (Knight and Clemmer 1987). According to USFWS (1985), existing populations were smaller and less numerous than those known historically because of habitat eliminations during agricultural development From 1987 through 2001, eight occurrences were mapped totaling 3,862 plants covering approximately 9.1+ acres (NNHP 2001), but are now more widely distributed.

Life History

There is little known about the life history of Ash Meadows ivesia, but it is known as a matted perennial herb that flowers from August to October. All other stages including germination, leafing, budding, fruiting and fruit dispersal and dissemination agents are unknown (CMI 1996).

Ash Meadows ivesia is associated with highly alkaline, clay lowlands or depressions where soil moisture remains high from perched groundwater maintained by springs and seeps (50 FR 20777-20794). It occurs only in the mesic, meadow areas of just north and east of Ash Meadows at elevations ranging from 2,200- 2,300 feet amsl (CMI 1996). The flat, mesic, meadow areas with white, alkaline clay soils are remnants of Pleistocene age lakes. The ivesia is associated with *Distichlis spicata* var. *stricta*, *Centaurium namophilum*, *Haplopappus acradenius*, *Spartina gracilis*, *Juncus balticus*, and *Cordylanthus tecopensis* (Knight and Clemmer 1987). According to NNHP (2001), Ash Meadows ivesia occurs in open, moist to saturated, whitish, heavy, to

chalky soils on flats, drainages, and bluffs near springs and seeps, in saltgrass meadow, shadscale, and ash-mesquite vegetation with *Atriplex confertifolia*, *Prosopis* spp, *Cirsium mohavense*, *Fraxinus velutina*, *Anemopsis californica*, and *Iva acerosa*.

Threats to the Species

Threats to the Ash Meadows ivesia include trampling by cattle, wild horses, and sheep, and spring diversions and groundwater pumping resulting in the drying of soils and elimination of its habitat (USFWS 1990). The existing populations are smaller and less numerous than those known historically because of habitat eliminations during agricultural development, including cropland development, spring alteration, and stream channelization and diversion, and during road construction occurring with municipal development (50 FR 20777-20794).

Groundwater depletion, drying ivesia habitat, poses the greatest threat to the existence of the species. Its dependence on perched groundwater issuing from seeps and springs or their outflows makes it extremely vulnerable to decreases in spring discharge that result in less water seeping to areas distantly removed from water sources (50 FR 20777-20794). In addition, road construction could eliminate populations by passing through habitat or interrupting drainage patterns and drying areas that were previously moist. Approximately 45 percent of the known populations occur on the Ash Meadows NWR.

Species in the Project Area

The Project area is located approximately 9 miles northwest of the nearest known locations of the species in Nevada at Ash Meadows and Carson Slough. The plant has never been found within the Project area, although the plant populations at Ash Meadows share some groundwater-related commonalities with the Project area. The Ash Meadows Basin (includes most of Ash Meadows NWR) and Alkali Flat-Furnace Creek Basin (includes the Project area and a small portion of Ash Meadows NWR) are connected by the Central Death Valley subregion of the DVRFS.

Ash Meadows Milkvetch

Regulatory Status

The Ash Meadows milkvetch (*Astragalus phoenix*) was proposed threatened under the ESA on October 13, 1983 with six other rare plants and one insect species in Ash Meadows, Nevada and California (48 FR 46590-46598), and finally listed as threatened with designated critical habitat on May 20, 1985 (50 FR 20777-20794). The plant was included in a recovery plan at Ash Meadows with 11 other federally listed species in 1990 (USFWS 1990). In addition to federal protection, it is fully protected in Nevada, is a BLM Special Status Species in Nevada, and is considered threatened by the Nevada Native Plant Society (NNHP 2001). Designated Critical habitat includes nine small areas east of Carson Slough at Ash meadows in Nye County, Nevada. This designation includes 1,200 acres of dry, hard, white, barren saline, clay flats, knolls, and slopes, which is the only suitable habitat for the plant (USFWS 2009a).

Species Description

The Ash Meadows milkvetch was first collected in Ash Meadows by Carl Anton Purpus in 1898. His original specimen was left unnamed until botanist Art Cronquist (1972) collected and named a second better specimen in 1966. It was finally described by Rupert Barneby in 1970 (Barneby 1970). This low, mat-forming perennial herb is a member of the legume or pea family, which is comprised of 450-500 genera and many thousands of species, many of great economic importance for food, forage, dyes, and wood (Munz 1974).

The plant forms mounds that are up to 40-50 centimeters across. The older stems characteristically have a flaking bark. The leaves, which are densely covered with coarse, white hairs, are 1.5 to 3.5 centimeters long and bear 2 to 3 ovate to obovate leaflets which are 3 to 7 millimeters long. The stipules are 2 to 3 millimeters long, pubescent on the outer surface and glabrous on the inner surface. The pinkish to purple flowers are borne on short, erect stems in a mat and commonly number only one or two per inflorescence. No other species occurs within the known range of *Astragalus phoenix* with which it could easily be confused. The flowers are very similar to those of *A. newberryi* Gray, but the latter is vegetatively very different in that it does not form the dense mound of foliage typical of *A. phoenix* (Mozingo and Williams 1980).

Status and Distribution

The Ash Meadows milkvetch is endemic to the Ash Meadows area in Nye County. Its range includes the Ash Meadows NWR, a small portion of the BLM Ash Meadows ACEC adjacent to the northeastern refuge boundary, and private lands within the refuge boundary. The plant was originally known from six sites in spring areas of north and east Ash Meadows (Beatley 1976). Two years later, Reveal (1978) estimated the population to contain 1,000 individuals. Cochrane (1981) identified 19 localities at which the milkvetch had been reported. Knight and Clemmer (1987) reported the species at six sites, which represented subpopulations of one historically larger, biological unit growing as adaphic endemics. In 1998, survey efforts concentrated on the six sites identified by Knight and Clemmer in 1987, and the total population was estimated to be about 1,800 plants on 847 acres (BLM and USFWS 2000b.).

Refuge-wide surveys of listed and rare plants, including, Ash Meadows milkvetch, were begun in 2008. As a result of these surveys, the total population on the wildlife refuge is estimated at 11,643 individuals on about 800 acres (Bio-West 2008a). According to Bio-West (2008a), a large area on public land occupied by the milkvetch was newly discovered adjacent to a previously known population on private land in 2008. The occupied area at most other previously reported sites was also extended.

Life History

The life history and habitat requirements of Ash Meadows milkvetch are largely unknown (USFWS 1990), but appear to be consistent with a stress-tolerant life history as described by Grime (1977). It is known to be a long-lived perennial composed of spreading branches that eventually form large, pulvinate mounds. Both foliage and fruit are matted with dense, grayishhairs. The plants accumulate air-borne particles, becoming partially buried by maturity (Knight and Clemmer 1987).

Stress-tolerant plants are typically long-lived with low annual production, except during favorable conditions (Grime 1977). According to Reveal (1978), winter and early spring rains are required to produce large numbers of flowers, but some flowering occurs each year regardless of climatic conditions. Flowering occurs in early spring from March to late May with fruit forming in April and lasting to June-July. It appears that population growth is constrained by low seed output per plant when precipitation is low. The opposite is generally true when there is above average precipitation. However, in a study conducted by Pavlik et al. (2006), seedlings were not observed at four of the six known sites during a year with above average precipitation. It was suggested that either the seed bank was depleted or the species was dependent on the most extreme and infrequent precipitation events. Wind and water appear to be the primary vectors for dispersal of seeds, and these seeds typically remain within the leaves and branches of the parent plant (USFWS 2009b).

Stress-tolerant species, like Ash Meadows milkvetch are generally slow to recover from disturbance, and given the little known life history of the plant and its naturally low rate of reproduction, it is unlikely that severely disturbed habitat has recovered. However, the slow population increases are probably the result of new protections implemented at Ash Meadows since it was established as a wildlife refuge (USFWS 2009c).

The Ash Meadows milkvetch grows between 2,200 and 2,300 feet elevation amsl, and appears to be restricted to flats and knolls of hard, white, alkaline clay soils in the Ash Meadows area (Knight and Clemmer 1987). The specific hydrological requirements for the species are largely unknown, but surface and subsurface groundwater that reaches the surface through capillary action may be an important habitat determinant for at least some of the populations of the species. The primary constituent elements of designated critical habitat consist of the biological and physical attributes essential to the species' conservation within those areas (USFWS 2009c). Those elements include hard, white, barren, saline, clay flats, knolls, and slopes (USFWS 2009c). Plant species associated with the Ash Meadows milkvetch include, saltgrass, shadscale, Ash Meadows blazing star, Alkali golden bush (*Isocoma acradenius*), and Ash Meadows sunray (*Enceliopsis nudicaulis* var. *corrugata*) (Knight and Clemmer 1987).

Threats to the Species

The threats to Ash Meadows milkvetch are consistent with those of other Ash Meadows plants and ecosystem including: (1) Present and threatened destruction, modification, or curtailment of habitat or range (e.g., groundwater withdrawal, surface mining, proposed road construction); (2) inadequacy of existing regulatory mechanisms; (3) other natural or manmade factors affecting continued existence (e.g., trampling by wild horses) ; (4) non-native species; (5) rabbit herbivory of flowers and fruits; (6) OHVs; (7) stochastic events affecting species with restricted ranges or small population sizes; and (8) climate change (USFWS 2009c).

At the time of listing, groundwater development was a major threat to the milkvetch and the entire Ash Meadows ecosystem. The milkvetch depends, in part, on near-surface water for its survival. Water levels in Devils Hole stabilized after groundwater pumping on the refuge stopped in 1975; however, the water level in Devils Hole declined 7 centimeters between 1988 and 2004, and increased again after a wet year. As groundwater pumping at Ash Meadows decreased, it

increased in the Amargosa Valley, and is currently occurring in some areas of the basin at about twice the rate predicted to be sustainable (USGS 2005).

Habitat loss or degradation from surface mining occurs in the Ash Meadows area. New mineral claims and subsequent mining could cause direct loss of Ash Meadows milkvetch habitat, as well as indirect impacts by diverting or draining water away from occupied habitat. Surface mining of a valid existing mining claim on private land within the wildlife refuge, therefore, poses a significant threat to one of the six known populations of Ash Meadows milkvetch. Alteration of the local groundwater table from mining could negatively affect this population and adversely modify its critical habitat on adjacent public land (USFWS 2009c).

New proposed road construction is not a threat to the milkvetch; however, some populations along the Ash Meadows Road may have been affected by the disruption of surface flows due to prior road construction. The species is found on the floor of washes and water has been identified as one of the vectors by which its seed may be distributed (Reveal 1978).

Non-native species impact approximately 42 percent of all federally listed and rare plants in the United States. (Pimental et al. 2005). They compete directly with native species for water, nutrients, and sunlight, and indirectly by altering ecosystem processes such as nutrient cycling and fire regimes (Brooks et al. 2004). The flats and knolls of hard, dry, alkaline clay that support the Ash Meadows milkvetch is a harsh environment, so weeds have not been identified as a major threat to the species. However, salt cedar (*Tamarix ramosissima*), Russian knapweed, five hook bassia (*Bassia hyssopifolia*), Malta star thistle, yellow star thistle, and hoary cress are noxious weeds that could potentially threaten Ash Meadows milkvetch (USFWS 2006b).

Species in the Project Area

The Project area is located approximately 9 miles northwest of the nearest known locations of the species in Nevada at Ash Meadows and Carson Slough. The plant has never been found within the Project area, although the plant populations at Ash Meadows share some groundwater-related commonalities with the Project area. The Ash Meadows Basin (includes most of Ash Meadows NWR) and Alkali Flat-Furnace Creek Basin (includes the Project area and a small portion of Ash Meadows NWR) are connected by the Central Death Valley subregion of the DVRFS.

Ash Meadows Sunray

Regulatory Status

The Ash Meadows sunray (*Enceliopsis nudicaulis* var. *corrugata*) was first proposed as threatened under the ESA on October 13, 1983 with six other rare plants and one insect species in Ash Meadows, Nevada and California (48 FR 46590-46598), and was listed as threatened with designated critical habitat on May 20, 1985 (50 FR 20777-20794). The plant was included in a recovery plan at Ash Meadows with 11 other federally listed species in 1990 (USFWS 1990). In addition to federal protection, it is fully protected in Nevada, is a BLM Special Status Species in Nevada, and is considered threatened by the Nevada Native Plant Society (NNHP 2001).

Approximately 1,760 acres of designated critical habitat are located in the Ash Meadows area in Nye County, Nevada, approximately 7 miles southeast of the Project (USFWS 1990). It includes nine locations, comprised of three main subpopulations, along and east of Carson Slough and in the vicinity of Devils Hole. Some of this area overlaps with critical habitats for the Ash Meadows milkvetch and Ash Meadows blazing star (USFWS 1990).

Species Description

Ash Meadows sunray was described in 1972 from specimens collected by Cronquist in 1966 in north Ash Meadows (Cronquist 1972; Beatley 1976). This medium-sized perennial shrub is a member of the sunflower family, the largest family of vascular plants, with a possible 950 genera and 20,000 species, chiefly herbaceous, and world-wide in distribution (Munz 1974). It forms clumps 10–40 centimeters high from a stout, woody root-stock. The leaves, which are densely tomentose with fine grayish-white hairs, are relatively small, with a blade about 1 to 3.6 centimeters long. They are ovate to subcircular in shape. The leafless flower stalks bear individual heads with disks 0.8 to 1.4 inches across. The ray flowers number 11 to 23 and possess yellow corollas 2 to 2.5 centimeters long. The disk flowers are strongly compressed. The silky-pubescent achenes bear 2 short awl-shaped awns connected by a whorl of short, fused scales, but sometimes the pappus are absent on the achenes. This variety appears as a geographically peripheral phase of the species *E. nudicaulis*, and is distinctive in habitat and morphological features (CMI 1996). The varietal name, *corrugata*, refers to its strongly ruffled-corrugate leaves (Mozingo and Williams 1980).

Status and Distribution

This variety of sunray is found in local populations in or near limestone mountain ranges or limestone outcrops. Historically, the plant occupied the southern end of Monitor Range, northern Belted Range, and the foothills of Quinn Canyon Range at elevations ranging from 3,300 to 6,400 feet amsl. (Beatley 1976). The elevational range was also reported from 2,300 to 2,410 feet in Mozingo and Williams (1980). The Ash Meadows sunray is endemic to Ash Meadows where it occupies dry washes and weathered saline soils. According to USFWS (50 FR 20777-20794):

> "It is one of the more common species of plants endemic to Ash Meadows but its populations have been reduced during the past 15 years by habitat elimination for agricultural production, the initial phases of PEC's development, and road construction."

PEC (Preferred Equities Corporation) is a real estate developer that purchased land in Ash Meadows during the 1980s.

In the late 1980s, the sunray was found throughout the Ash Meadows NWR, and was the most widespread of the rare species, but populations were destroyed during road construction, land leveling for crops, and alterations for municipal development between 1970 and 1985 (USFWS 1990, 2009b).

At Rogers-Purgatory-Longstreet Springs along Carson Slough, the habitat is variably disturbed from clay mining and OHV use. There are two distinct populations in this area. In central Ash

Meadows, the populations are very large but are somewhat fragmented occurring from the terrace overlooking Old Rooker Ranch to Collins Ranch and southwest to Amargosa Reservoir. This area is riddled with roads, OHV tracks, agricultural fields, and other human-caused disturbances (Knight and Clemmer 1987). Within the southeast portion of Ash Meadows, sunray populations and habitat run from west of the county dirt road to Jack rabbit Spring and south nearly to Big Spring. The area is disturbed by county and private roads, private ranches, and natural and altered drainage patterns from the springs (Knight and Clemmer 1987).

Life History

There is little known about the life history and habitat requirements of the Ash Meadows sunray, particularly the reproductive phenology except that flowering occurs between April and May. It flowers coincidentally with the Ash Meadows milkvetch. A single plant usually produces a number of flowering stalks, each supporting an individual yellow flower (USFWS 1990).

It typically occurs in whitish, poorly drained, alkaline soils along dry washes or on pale, hard limestone outcrops. The region within which this plant grows is relatively dry; rainfall in Ash Meadows averages three to five inches per year, falling mainly in the autumn and winter with some sporadic summer rains (CMI 1996). *Enceliopsis* is generally a common component of the perennial flora. Much of the lower elevation alkali clay soils have underlying water table making the habitat inappropriate for *Enceliopsis* distribution. This is particularly true along the western and southern borders of the wildlife refuge (Knight and Clemmer 1987). It occupies habitats of the Ash Meadows milkvetch and Ash Meadows blazing star in addition to areas that are more densely vegetated with *Ambrosia dumosa*. According to Mozingo and Williams (1980), individuals are restricted to dry, upland areas outside the influence of water from seeps and springs. However, recent soil surveys have revealed that approximately 14 percent of the populations occur on landtypes that are saturated to the surface or to within 50 cm in the winter months (Novosak 2010, personal communication). In CMI (1996) and Knight and Clemmer (1987), Ash Meadows sunray is associated with *Atriplex confertifolia*, *Haplopappas acradenius*, *Arctomecon merriami*, and *Cryptantha confertifolia*.

Threats to the Species

Recent losses of habitat due to agricultural and municipal/residential development activities, land clearing for road construction, groundwater removal and surface spring diversion and local mining activities, all have threatened the species habitat and ultimately their survival. Ash Meadows remained largely intact until 1967 when PEC purchased large tracts (approximately 20 square miles) in the northern and eastern regions. In their attempt to farm the land, they plowed large areas of land and installed pumps at the springs. These alterations virtually obliterated the natural features of the area including Carson Slough and its surrounding vegetation. Corporate farming failed in the area and it was abandoned in 1975 (CMI 1996).

Currently, the plant is threatened primarily by large-scale destruction of the native flora over large portions of the Ash Meadows area caused by continued agricultural development, road construction, and OHV activity (CMI 1996). Habitat destruction and mineral development has broken the hard, xeric alkali clay slopes of the upland topography into sporadic patterns (Knight

and Clemmer 1987). The sunray's distribution appears to be limited to a particular edaphic condition in washes weathered saline soils. Any further loss of its habitat would probably be detrimental to the species survival (CMI 1996).

Species in the Project Area

The Project area is located approximately 9 miles northwest of the nearest known locations of the species in Nevada at Ash Meadows and Carson Slough. The plant has never been found within the Project area, although the plant populations at Ash Meadows share some groundwater-related commonalities with the Project area. The Ash Meadows Basin (includes most of Ash Meadows NWR) and Alkali Flat-Furnace Creek Basin (includes the Project area and a small portion of Ash Meadows NWR) are connected by the Central Death Valley subregion of the DVRFS.

Spring-Loving Centaury

Regulatory Status

The variety of spring-loving centaury (*Centaurium namophilum* var. *namophilum*) was proposed endangered under the ESA on October 13, 1983 with six other rare plants and one insect species in Ash Meadows, Nevada and California (48 FR 46590-46598). However, USFWS later did not accept the validity varietal designations for *C. namophilum*, so the entire species was listed as threatened with designated critical habitat on May 20, 1985 (50 FR 20777-20794). The plant was included in a recovery plan at Ash Meadows with 11 other federally listed species in 1990 (USFWS 1990). In addition to federal protection, it is fully protected in Nevada, is a BLM Special Status Species in Nevada, and is considered threatened by the Nevada Native Plant Society (NNHP 2001). Approximately 1,840 acres of designated Critical habitat are scattered in or adjacent to Ash Meadows in Nye County, Nevada, approximately 7 miles southeast of the Project (USFWS 1990).

Species Description

The taxonomy of the spring-loving centaury has been a contentious issue since the 1970s. The spring-loving centaury was first collected in 1891 by Coville and Funston, while on the Death Valley expedition (Knight and Clemmer 1987), but was not described until 1973 by Reveal, Broome, and Beatley (Reveal et al. 1973; 50 FR 20777-20794). According to Broome (1981), the plants collected from the Furnace Creek area in Death Valley closely resembled specimens of C. *namophilum* var. *namophilum* found in Shoshone and Tecopa in Inyo County, but due to certain morphological characteristics, the specimens were likely to be a second variety; *C. n.* var. *nevadense*. During Broome's survey in 1981, she also found *C. n. namophilum* near Beatty, Nevada, although Morefield (1991) did not relocate it, but found several populations of *C. exaltatum* and *C. calycosum* instead. Intermountain flora and Jepson Manual treatments combined *C. n. nevadense* with *C. exaltatum*, and *C. n. namophilum* became a valid taxon without varietal distinctions. It is now officially identified as *Centaurium namophilum*, and is currently restricted to Ash Meadows (USFWS 2009d; Knight and Clemmer 1987; 50 FR 20777-20794; USFWS 1990).

This annual herb is a member of the pea family, comprised of over 65 genera and 600 species, is widely distributed, but most abundant in temperate regions. A colorless bitter juice is a distinguishing characteristic of the family (Munz 1974). The spring-loving centaury is an erect, annual herb, up to 45 centimeters tall with flowering stems borne from the base and flowering lateral branches. Stems and herbage are glaucous and the leaves are opposite, not forming basal rosettes. Stems are yellowish to tannish with internodes up to 4 centimeters long. Inflorescences extend more than half the length of the plant, and are paniculate-cymose (Knight and Clemmer 1987). Flowers are deep rose-pink above and below. The throat is yellowish with five dark purple spots below the juncture of adjacent petals (Reveal et al. 1973).

Status and Distribution

Historically, the plant probably occupied all the springs and seeps in the northern and eastern sections of Ash Meadows until development in the 1960s through 1980 reduced its distribution to small isolated patches. Cochrane (1981) identified 17 localities at which the plant had been previously observed, and Knight and Clemmer (1987) reviewed data and identified seven general areas from which the species had been reported. In 1998, surveys targeted those seven locations, and as a result, the population was estimated to be approximately 175,000 plants on 522 acres (BLM and USFWS 2000c).

The centaury is endemic to the Ash Meadows area of Nye County, Nevada. Its range includes the Ash Meadows NWR and adjacent public and private land. On public land managed by the BLM, the plant is found entirely within the Ash Meadows ACEC. Beginning in 2008, rangewide surveys were conducted for all rare plants throughout the Ash Meadows NWR. As a result of the survey effort for spring-loving centaury, the total population is estimated to be 4,468,571 individuals on about 800 acres (Bio-West 2008b). The likely reasons for the increase from 1998 to 2008 is most likely due to better, more comprehensive survey effort, natural fluctuations in the population size of an annual species, and differences in estimation protocols (USFWS 2009d).

According to Bio-West (2008b), the plants confirmed in the 2008 surveys were found at most of the previously recorded sites. In addition, distribution range of the plants in 1998 was extended in most locations to connect populations that were once believed to be separate. They found the plant to be widespread throughout the wildlife refuge in habitats that included seasonally flooded wetlands to seasonally moist alkali meadows, and the edges of some alkali scrub-shrub communities. In addition, they concluded that any habitat with surface or subsurface water was potential habitat for the species. The species has apparently extended beyond the wildlife refuge as well, but it is important to note, while the numbers have increased at most locations, other smaller populations reported in 1998 have apparently disappeared.

Based on the 2008 survey effort conducted by Bio-West (2008b), the current distribution includes six major subpopulations with additional minor subpopulations. They include: (1) Purgatory-Rogers-Longstreet-Five springs-North Carson Slough- T17S, R50E, Sections 10, 14-16, 20-23; (2) Scruggs-Mary-Scott-Indian School-Crystal-marsh springs- T17S, R50E, Sections 7-10,and 15-18; (3) Unmapped seep west of South Springs Meadow road- T18S, R50E, Sections 14 and 23; (4) Point of Rocks Springs- T18S, R51E, Sections 7 and 12; (5) Jackrabbit-Big springs- T18S, R51E, Sections 18-19 and west from Big Spring extending into T18S, R50E,

Sections 14, 22-24; and (6) last Chance-Bole-Brahma springs- T18S, R51E, Sections 20, 29, and 30 (USFWS 2009d).

The land and management of spring-loving centaury within the wildlife refuge is 50 percent USFWS land, 45 percent BLM land, and 5 percent private land. No data are available for populations outside the wildlife refuge within the BLM Ash Meadows ACEC (USFWS 2009d).

Life History

The life history and habitat requirements of spring-loving centaury are largely unknown, but general observations indicate it is an annual species that flowers during the late summer and autumn (USFWS 1990). According to Reveal et al. (1973), each flower develops into a narrow, linear seed capsule containing about 50 seeds, of which one plant can produce thousands. Like other plants, it likely has certain controls that delay germination, allowing it to persist in the soil seed bank for long periods (USFWS 2009d). The seeds are small (0.07–0.09 centimeter) and are easily dispersed by wind, water, and animals. Similar to other plants, most seed probably remains near the parent plant.

According to USFWS (2009b), it is unknown whether the centaury is self compatible or requires pollination, but based on the present distribution and population numbers, pollination probably does not limit reproduction. Even though little is known or understood about the centaury's life history, it is probably consistent with other species that have adapted to disturbed habitats (ruderal), like agriculture and other human-caused activities that impact habitats. Grime (1977) described ruderal plants with similar life histories as being adapted to disturbance, where the relative proportion of energy devoted to seed production is high, and capable of recovering from disturbance more quickly than other species.

The spring-loving centaury grows at elevations between 2,070 to 2,320 feet amsl in alkaline clay soils where water availability is a limiting factor (Pavlik and Manning 1986). It prefers moist to wet clay soils along the banks of streams or in seepage areas, habitat similar to that of Ash Meadows gumplant (USFWS 2009b). Where found, it occurs in abundance and is associated with *Cordylanthus tecopensis*, *Distichlis spicta*, var. *stricta*, *Baccharis emoryi*, *Fraximus velutina*, and *Prosopis* (Knight and Clemmer 1987), and *Pyrrocoma* spp., *Juncus balticus*, *Anemopsis californica*, *Nitrophila occidentalis*, *Atriplex* spp, *Tamarix* spp., *Typha* spp., and *Iva* spp. (NNHP 2001). According to Reveal et al. (1973) in USFWS (2009b), the plant typically grows in wet saltgrass meadows near springs and streams and occasionally in low uplands at seeps.

Threats to the Species

The threats to spring-loving centaury are consistent with those of other Ash Meadows plants and ecosystem. They include: (1) Present destruction, modification, or curtailment of habitat or range (e.g. groundwater withdrawal, surface mining, non-native species; (2) overutilization for commercial, recreational, scientific, or educational purposes (e.g. disease or predation); (3) inadequacy of existing regulatory mechanisms; (4) other natural or manmade factors affecting continued existence (e.g., vulnerability to environmental uncertainty, and climate change) (USFWS 2009d).

The spring-loving centaury depends on the outflow of springs and near-surface water for its survival, so local groundwater pumping negatively affects populations of the species (USFWS 2009d). At the time of listing, groundwater development was a major threat to the entire Ash Meadows ecosystem. Water levels in Devils Hole stabilized after groundwater pumping on the Ash Meadows NWR stopped in 1975; however, the water level at Devils Hole declined 7 centimeters between 1988 and 2004, and increased again after a wet year. As groundwater pumping at Ash Meadows decreased, it increased in the Amargosa Valley, and is currently occurring in some areas of the basin at about twice the rate predicted to be sustainable (USGS 2005).

Habitat loss or degradation from surface mining occurs in the Ash Meadows area. New mineral claims and subsequent mining could cause direct loss of spring-loving centaury, as well as indirect impacts by diverting or draining water away from occupied habitat. Surface mining of a valid existing mining claim on private land within the wildlife refuge, therefore, poses a significant threat to about 50 percent of the known occurrences of the centaury within the wildlife refuge that are open to public minerals. The existing claims do not occur near any of the large populations of the plant, so mining doesn't pose a significant threat to those populations (USFWS 2009d).

Non-native species impact approximately 42 percent of all federally listed and rare plants in the United States. (Pimental et al. 2005). They compete directly with native species for water, nutrients, and sunlight, and indirectly by altering ecosystem processes such as nutrient cycling and fire regimes (Brooks et al. 2004). Over 100 non-native species, approximately 16 percent of the total flora, occur on Ash Meadows NWR. Of the total, six species could potentially threaten the centaury including salt cedar, Russian knapweed, five hook bassia, Malta star thistle, yellow star thistle, and hoary cress (USFWS 2006c). The wet meadows and old agricultural fields that support the species are also favorable conditions for non-native, noxious weeds. There are about 4,460 acres of old agricultural fields on Ash Meadows NWR, and some of these fields are nearly monocultures of non-native noxious weeds; however, approximately 315 acres or roughly 10 percent of spring-loving centaury habitat is threatened by non-native noxious weeds (USFWS 2009d).

Since the final listing rule was published for spring-loving centaury, laws and regulations were interpreted as simply providing recognition of the species' status, but no legal protection was afforded to the individual plants or their habitats. Weak interpretation and enforcement of these laws and regulations in Nevada, where the plant occurs, has further threatened the species' survival. Since the final listing rule was published, regulations have been strengthened and new regulatory mechanisms have been developed to protect and conserve the spring-loving centaury (USFWS 2009d).

Other natural or manmade factors affecting the species' continued existence include vulnerability to environmental uncertainty and climate change. Environmental uncertainty includes extreme flash flooding, which could affect the species, but because its distribution creates population redundancy, flash flooding does not appear to be a serious threat to the centaury. The same holds true for climate change. Based on current climatic modeling, the southwestern United States is likely to experience increased frequency of regional drought in response to elevated levels of atmospheric CO_2. The aquifer that supports the centaury is recharged from precipitation in the

same area. If precipitation decreases significantly in the area, it could affect the plant, but to what level climate change will have on the local aquifer that supports the ecosystem and the plant is unknown. Monitoring groundwater change would be important to identifying climate change as a potential threat (USFWS 2009d).

Species in the Project Area

The Project area is located approximately 8 miles northwest of the nearest known locations of the species in Nevada at Ash Meadows and Carson Slough. The plant has never been found within the Project area, although the plant populations at Ash Meadows share some groundwater-related commonalities with the Project area. The Ash Meadows Basin (includes most of Ash Meadows NWR) and Alkali Flat-Furnace Creek Basin (includes the Project area and a small portion of Ash Meadows NWR) are connected by the Central Death Valley subregion of the DVRFS.

3.6.4.5 Sensitive Plant Species

No special status plant species were located within the Project area during field surveys. However, two cactus species were located. Two individual beavertail prickly pear and seven golden cholla were found in the Project area (see Figure 3-11). Neither species is considered rare; however, both are protected by the State of Nevada's statute for the protection of Christmas trees, cacti, and yucca (NRS 527.060-.120).

Tecopa bird's-beak (*Cordylanthus tecopensis*) has been identified by the BLM as a species of concern in Nevada. This annual herb occupies moist alkaline meadows and flats, saltbush scrub within Mohave desert scrub. It is found in salt encrusted clay soils at 2,000 to 2,700 feet elevation along bottomlands of the Amargosa River drainage, east of Death Valley in California and Nevada and in Fish Lake Valley, Nevada. Locally, several populations occur in Ash Meadows, each following major drainage patterns of the springs. (NDOW 2003; Knight and Clemmer 1987; Mozingo and Williams 1980). Main threats to this species include water diversion, development, intensive recreation/OHV, non-native species, vandalism, vegetation encroachment (undesirable species), groundwater pumping, wild burros and livestock, rights-of-way, and mining (NDOW 2003; Mozingo and Williams 1980).

3.6.5 Wildlife Resources

The ROI for wildlife resources, including threatened, endangered, proposed, and candidate wildlife species, consists of areas that may be affected by permanent and temporary features of the Proposed Action and areas where groundwater withdrawal may impact surface and groundwater hydrology. The extent of the ROI for wildlife resources is based on the effects of the proposed Project on water resources as described in Section 3.4. Based on these criteria, the ROI for direct impacts on wildlife resources includes those areas in the immediate vicinity of the Proposed Action construction, operation, and maintenance activities. The ROI for indirect effects is the Amargosa Desert Hydrographic Basin.

3.6.5.1 Wildlife Observed within the Project Area

Fifty-eight vertebrate species were detected or seen over the course of the field surveys in the Project area during the spring and summer of 2009. Of these, 13 species were reptiles, 27 species were birds, and 18 species were mammals (Tierra Data 2009).

Thirteen species of reptiles were found or detected in the Project area during 2009 surveys (Table 3-15). The only protected reptile species detected was the Desert Tortoise which is listed as threatened under the ESA and discussed further in section 3.6.5.2.

Table 3-15 Reptiles Observed in the Project Area

Common Name	Scientific Name	Common Name	Scientific Name
Desert Tortoise	*Gopherus agassizii*	Desert Iguana	*Dipsosaurus dorsalis*
Long-nosed Leopard Lizard	*Gambelia wislizenii*	Zebra-tailed Lizard	*Callifsaurus draconoides*
Side-blotched Lizard	*Uta stansburiana*	Desert Horned Lizard	*Phyrnosoma platyrhinos*
Great Basin Whiptail	*Aspidocelis tigris*	Spotted Leaf-nosed Snake	*Phyllorhynchus decutatus*
Red Racer	*Masticophis flagellum*	Glossy Snake	*Arizona elegans eburnata*
Long-nosed Snake	*Rhinocheilus lecontei*	Nevada Shovel-nosed Snake	*Chionactis occipitalis talpina*
Mojave sidewinder	*Crotalus cerastes*		
Source: Tierra Data 2009			

Twenty-seven bird species were seen or detected within the Project area during 2009 surveys, although no nests were found (Table 3-16). Surveys revealed that avian nesting potential is low to moderate owing to the sparse nature of the vegetation. No active nests for any species were located during 2009 surveys. Of the 27 total identified species five are classified as sensitive: Swainson's Hawk, Prairie Falcon, Phainopepla, LeConte's Thrasher, and Burrowing Owl. These species are discussed further in section 3.6.5.3.

Table 3-16 Bird Species Observed in the Projet Area			
Common Name	**Scientific Name**	**Common Name**	**Scientific Name**
Great Egret	*Ardea alba*	White-faced Ibis	*Plegadis chihi*
Turkey Vulture	*Cathartes aura*	Cooper's Hawk	*Accipiter cooperii*
Swainson's Hawk	*Buteo swainsoni*	Red-tailed Hawk	*Buteo jamaicensis*
American Kestrel	*Falco sparverius*	Prairie Falcon	*Falco mexicanus*
Eurasian Collared Dove	*Streptopelia decaocto*	Mourning Dove	*Zenaida macroura*
Greater Roadrunner	*Geococcyx californianus*	Burrowing Owl	*Athene cunicularia*
Lesser Nighthawk	*Chordeiles acutipennis*	Ash-throated Flycatcher	*Myiarchus cinerascens*
Western Kingbird	*Tyrannus verticalis*	Common Raven	*Corvus corax*
Horned Lark	*Eremophila alpestris*	LeConte's Thrasher	*Toxostoma lecontei*
Phainopepla	*Phainopepla nitens*	Wilson's Warbler	*Wilsonia pusilla*
Chipping Sparrow	*Spizella passerina*	Black-throated Sparrow	*Amphispiza bilineata*
Lincoln's Sparrow	*Melospiza lincolnii*	Black-headed Grosbeak	*Pheucticus melanocephalus*
Great-tailed Grackle	*Quiscalus mexicanus*	House Finch	*Carpodacus mexicanus*
House Sparrow	*Passer domesticus*		
Source: Tierra Data 2009			

Twelve terrestrial mammal species were detected or observed in the Project area during the 2009 surveys (Table 3-17). No special status mammals were detected.

Large mammals are not thought to be common to this area, however, burro tracks were encountered frequently throughout the Project area and two burros were observed traversing the Project area during the spring surveys. Wild burros are managed by the BLM. The closest actively managed herd management area (HMA) is the Johnnie HMA. This HMA boundary lies approximately 15 miles east of the Project area. The current estimated population for the Johnnie HMA is 77 wild horse and 158 wild burros. In addition to burro presence, during the spring 2009 survey, a Bighorn Sheep skull was found in Fortymile Wash. No other big game species were detected within the Project area.

In addition to the 12 terrestrial mammals species, 6 species of bats were detected during acoustic surveys in 2009 (Table 3-17). All of these species are considered sensitive species and are discussed further in section 3.6.5.3. No bat roosting habitat was identified in the Project area.

Table 3-17 Mammal Species Observed in the Project Area			
Common Name	**Scientific Name**	**Common Name**	**Scientific Name**
Deer Mouse	*Peromyscus maniculatus*	Little Pocket Mouse	*Perognathus longimembris*
Long-tailed Pocket Mouse	*Perognathus formosus*	Merriam's Kangaroo Rat	*Dipodomys merriami*
White-tailed Antelope Squirrel	*Ammospermophilus leucurus*	Desert Cottontail	*Sylvilagus audubonii*
Black-tailed Jackrabbit	*Lepus californicus*	California Myotis	*Myotis californicus*
Yuma Myotis	*Myotis yumanensis*	Western Paratrelle	*Parastrellus Hesperus*
Townsend's Big-eared Bat	*Corynorhinus townsendii townsendii*	Pallid Bat	*Antrozonous pallidus*
Brazilian Free-tailed Bat	*Tadarida brasiliensis*	Domestic Dog	*Canis familiaris*
Coyote	*Canis latrans*	Kit Fox	*Vulpes velox*
Burro	*Equus asinus*	Bighorn Sheep	*Ovis canadensis*
Source: Tierra Data 2009			

3.6.5.2 Federally Threatened, Endangered, Proposed, and Candidate Wildlife Species

The USFWS identified several threatened and endangered wildlife species with the potential of occurring in the proposed Project area or in the ROI. No proposed or candidate species were identified. Table 3-18 lists these species and identifies corresponding protection status under the ESA, BLM, and NDOW.

Table 3-18 Endangered and Threatened Wildlife Species that May Occur within the Region of Influence					
Scientific Name	**Common Name**	**Habitat**	**Endangered Species Act**	**State of Nevada**	**BLM**
Gopherus agassizii	Desert Tortoise (Mojave population)	Mojave desertscrub	Threatened	Protected	Sensitive
Cyprinodon diabolis	Devils Hole Pupfish	Devils Hole	Endangered	Protected	Sensitive
Cyprinodon nevadensis mionectes	Ash Meadows Amargosa Pupfish	Ash Meadows – large, warm waters	Endangered	Protected	Sensitive
Cyprinodon nevadensis pectoralis	Warm Springs Pupfish	Ash Meadows – Warm Springs Complex	Endangered	Protected	Sensitive

Table 3-18 Endangered and Threatened Wildlife Species that May Occur within the Region of Influence

Scientific Name	Common Name	Habitat	Endangered Species Act	State of Nevada	BLM
Rhinichthys osculus nevadensis	Ash Meadows Speckled Dace	Ash Meadows – large, warm waters	Endangered	Protected	Sensitive
Ambrysus amargosus	Ash Meadows Naucorid	Ash Meadows – Point of Rocks Spring	Threatened	–	Sensitive

Source: USFWS 2009

Desert Tortoise (Mojave population)

Regulatory Status

The Desert Tortoise (*Gopherus agassizii*) consists of two geographically dissimilar populations: the Mojave and Sonoran. The Mojave population is defined as those tortoises north and west of the Colorado River and west of Beaver Dam Slope, Utah, and is distributed throughout southern Nevada, southeastern California, the Beaver Dam Mountains and Virgin River area of southwestern Utah, and northwestern Arizona. The Sonoran population is found in most of Arizona, western New Mexico, and south through Sonora to northern Sinaloa, Mexico. The Sonoran population of Desert Tortoises also occurs on Isla Tiburon, in the Sea of Cortez (Germano et al. 1994).

Major declines and die-offs of Desert Tortoises were observed in the Mojave Desert in the 1980s, leading to the emergency listing of the Mojave population of Desert Tortoise as endangered on August 4, 1989 (54 FR 32326-32331). On October 13, 1989, the USFWS published a proposed rule to list the Mojave population as endangered (54 FR 42270-42278), but because the emergency rule expired on April 2, 1990, it was necessary to publish the final rule on that day, to prevent a lapse in protection for the tortoise. On April 2, 1990, the USFWS published a determination of threatened status for the Mojave population of Desert Tortoise with no critical habitat determination at that time (55 FR 12178-12191).

The Mojave population has been divided into six distinct population segments or recovery units, based on presumed evolutionary history (those population segments are sometimes deemed evolutionarily significant units. Each recovery unit has been delineated based on variations in genetic, morphological, ecological, physiological, and behavioral traits (USFWS 2008), and the USFWS adopted recovery plan in 1994 (USFWS 1994). The USFWS is currently developing a revised recovery plan which is in draft form (USFWS 2008). Also, in 1994, the USFWS designated a total of 6.4 million acres of critical habitat (59 FR 5820-5866). Within those six management units, the USFWS identified Desert Wildlife Management Areas or areas, where populations of tortoises facing similar threats would be managed with the same strategies (59 FR 5820-5866).

The California and Nevada State Natural Heritage Programs have listed Desert Tortoises as imperiled, and in Utah they are considered critically imperiled (NatureServe 2009). The Desert Tortoise is protected by the State of Nevada (NNHP 2009). The Mojave population is on the watch list of species in Clark County, Nevada, and it is considered sensitive by the BLM and USFS (NNHP 2009).

Species Description

The Desert Tortoise was first described by Cooper in 1863 as *Xerobates agassizii*, named after the iconoclastic Harvard professor Louis Agassiz. Over the years, scientists assigned it to different genera including, *Scaptochelys* (Bramble 1971), *Xerobates* (Lamb et al. 1989), and *Gopherus* (Crumley 1994), the genus under which it is now recognized.

The Desert Tortoise has a domed shell (carapace) and a relatively flat, unhinged plastron (abdominal portion of the shell). The exterior of the carapace is comprised of horny plates made up of keratin called scutes. Adults will reach a carapace length of 8 to 15 inches and shell height of 4 to 6 inches. Adults typically weigh 8 to 15 pounds. When hatchlings emerge from their eggs, they are approximately 2 inches long (Ernst et al. 1994).

The Desert Tortoise is greenish-gray to dark brown with tan scute centers. Their forelimbs have heavy, conical scales and are flattened for digging and burrowing. Hindlimbs are more elephantine. When limbs pull in, they block the openings of the shell (Ernst et al. 1994).

Status and Distribution

Population densities of the Desert Tortoise are decreasing in many areas, particularly in the western Mojave Desert (Corn 1994). According to a USGS report by Berry and Medica (1995), density estimates in 1990 ranged from approximately 13 to 168 adult tortoises per square mile depending on location. A study in southeastern Nevada found a density of approximately 17 tortoises per square kilometer (44 per square mile), and most populations discussed in that report showed a downward trend (Berry and Medica 1995).

Although population density studies have been conducted for many years in several areas throughout the Desert Tortoise's range, inconsistencies in sampling techniques, study scale, and study goals make long-term population trend determinations impracticable. Those data may however provide a general overview of the species' range-wide status and demonstrate considerable declines at the local level (USFWS 2008). Beginning in 2001 (1999 in the Upper Virgin River Recovery Unit) annual range-wide monitoring was initiated (USFWS 2006d). Results from the first 5 years of this program estimated a population density low of 2 to 8 tortoises per square mile for the NE Mojave Recovery Unit and a high of 44 to 78 tortoises per square mile for the Upper Virgin River Recovery Unit (USFWS 2006d). The Project area is located within the NE Mojave Recovery Unit. Because this monitoring program is designed to measure long-term population trends, the first 5 years of the program are essentially to establish baseline densities and variability between years and between recovery units (USFWS 2006d).

Life History

Tortoises of the Mojave population are found primarily in Mojave desert scrub. They are generally associated with communities dominated by creosote bush and other sclerophyll shrubs and small cacti (Germano et al. 1994). Some parts of their range may contain abundant Joshua trees (*Yucca brevifolia*). In the Mojave Desert, the terrain is generally gently rolling alluvial fans with sandy or gravelly soils (Ernst et al. 1994).

Adequate burrowing substrate and thermal cover plant species are a crucial habitat component for Desert Tortoises. In the Mojave population, Desert Tortoises will construct their own burrows to avoid extreme hot or cold temperatures. They often excavate burrows under vegetation, up to 33 feet deep. Elevations at which tortoises occur in the Mojave population range from below sea level in Death Valley, California, up to about 5,000 feet at Yucca Mountain, Nevada (Arizona Game and Fish Department 2001).

The annual reproductive cycle of the Mojave Desert Tortoise begins in February or March when they emerge from hibernation. Mating generally takes place in the spring and may last into fall (Ernst et al. 1994). Between 1 and 14 eggs are laid in an excavated nest near a shrub or burrow entrance between May and July (Ernst et al. 1994). Incubation generally lasts for 90 to 120 days. Egg hatch rates vary, but hatchling and juvenile mortalities are assumed to be very high, and it has been estimated that only one hatchling for every 15 to 20 nests will survive to reach sexual maturity (Lawler, no date). Average age of reproductive viability of females is primarily a function of animal size, but is usually between the ages of 12 and 25 years (USFWS 1994). Females produce from one to three clutches of eggs per year (Turner 1986).

Desert Tortoises are herbivores, consuming a wide variety of plant materials including dicot annuals, grasses, herbaceous perennials, trees, shrubs, sub-shrubs/woody vines, and succulents (Arizona Game and Fish Department 2001). A study of their food habits in the Mojave Desert found that they used 43 plant species, including 37 annuals and 6 perennials. The diet showed a very strong preference for native plants (95.3 percent), and some of their preferred food plants were uncommon to rare (Jennings 1997). A study of juvenile tortoises found differences in diet between wet and dry summers. During a very dry summer, tortoises were observed foraging on only three species, but they used 15 species during a wet summer (Spangenberg 1995). Tortoises may forage selectively, sampling several possibilities before consumption (Oftedal 2002; Van Devender et al. 2002). Selective food preferences for individual tortoises within a population make plant diversity an important constituent of tortoise habitat (Tracy 2001). Desert Tortoises also ingest rocks, bones, and soil, possibly to maintain intestinal bacteria, to provide additional minerals, or as gastroliths to aid digestion (Esque and Peters 1994; Stitt and Davis 2003).

Threats to the Species

Desert Tortoises are facing numerous threats to their survival. Livestock grazing, recreational OHV use, military training activities, urban development, disease, and increases in predation are some of the factors that affect tortoise survival by reducing or fragmenting available habitat, causing population declines (Lovich 1999). Additional threats include illegal collection of tortoises as pets, vandalism (shooting, crushing or mutilation), road-kill mortality, and use as human food (USFWS 1994; Stitt and Davis 2003).

The presence of livestock may affect tortoise habitat in several ways. Tortoises, their eggs, and hatchlings can be killed directly by trampling and collapsing burrows. Livestock also trample vegetation (e.g., creosote bush) that is utilized by tortoises to shade burrows, pallets, and for thermoregulation. Impacts from grazing include damage to soils crusts and cryptogamic soils leading to increased erosion, decreased water infiltration due to soil compaction, and an increase in exotic annual vegetation, which compromises plant diversity and density, and increases fire fuel (USFWS 1994). Removal of native vegetation by livestock grazing allows the infiltration and proliferation of exotic plants on disturbed soils. Some of these invading exotic species include filaree (*Erodium cicutarium*), tumbleweed (*Salsola iberica*), split grass (*Schismus barbatus*), Arab grass (*S. arabicus*), cheat grass (*Bromus tectorum*), and red brome (*Bromus rubens*) (USFWS 1994), and are of decreased nutritional quality relative to native species (Oftedal 2002).

Invasion by exotic plants can have a negative impact on tortoises due to the changes that are effected in the native plant community. Red brome, for example, a European import, competes with native perennial grasses, shrubs, and annuals. Recurrent fires due to the presence of exotic ephemerals, such as red brome, can reduce the abundance and diversity of native forbs on which the tortoises depend (NPS 2009). Increased fires also aggravate habitat fragmentation, which is a major contributor to tortoise population declines (USFWS 1994).

Effects to tortoises and tortoise habitat by OHV use include mortality by crushing on the surface or in burrows, collapsing of burrows, destruction of soil crusts and compaction of soils, soil erosion, proliferation of weeds, increase in wild fires, and damage or destruction of plants used for food, water, and thermoregulation (USFWS 1994). A study of food preferences found that the preferred plant species were often found in washes and on hills. These areas also are heavily used by recreational OHVs (Jennings 1997). Since tortoises are very particular in their food plant selection, reduction of available food sources due to damage from recreational OHVs can force tortoises to change their diets. This may result in additional energy expenditures searching for acceptable food sources. When tortoises are forced to switch foods, they accrue a long-term digestive deficit due to the lag time in adjustment of their gut microflora to the new food source. Their effective feeding season is thus shortened (Tracy 2001).

Urban development has affected tortoises and tortoise habitat through habitat fragmentation and destruction. The construction of roads leads to habitat destruction, habitat fragmentation, road kills, and increased human access into formerly remote areas. The proliferation of landfills and illegal dumping subsidizes increased population densities of predators, including Common Ravens (*Corvus corax*), Coyotes (*Canis latrans*), and feral domestic dogs (*Canis familiaris*). These effects are greatest nearer to human settlements (USFWS 1994). Gila Monsters (*Heloderma suspectum*), snakes, skunks, and foxes are also tortoise egg predators (Ernst et al. 1994).

While predators are not normally a concern for tortoise populations in an undisturbed ecosystem, the perturbation of an ecosystem can cause predators to become a management issue. Increasing populations of generalist native predators have resulted in an increased rate of mortality of hatchling and juvenile tortoises. The USFWS's Breeding Bird Survey Program showed a 15-fold increase in raven populations in the Mojave Desert for the 20-year period from 1968 to 1988 (BLM et al. 1989). This surge in the raven population was attributed to increases in perching and

nesting structures. The food supplies listed were road-kills, landfills, trash, garbage dumps, and agricultural developments. The perching structures listed were fence posts, power poles and towers, signs, buildings, bridges, and freeway access ramps. Elevated perches were historically scarce in the Mojave Desert, and such man-made substitutes provide perching sites for predatory birds. Farrell (1989) documented ravens utilizing power line towers for perches while consuming juvenile tortoises (USFWS 1994). Human predation in the form of highway mortality and the illegal removal of adult tortoises for pets are also factors in the decreasing numbers of Desert Tortoises (Lovich 1999; 59 FR 5820-5866). Tortoises will urinate in response to harassments and this jeopardizes their survival through the summer due to water loss (Averill-Murray et al. 2002).

The manipulation of populations and/or individual tortoises during earlier conservation efforts was mostly unsuccessful. This may have been due to a lack of information regarding tortoise ecology, or poor planning. The translocation of in-situ tortoises and reintroduction of captive tortoises to the wild by the public are ongoing management problems. The historic lack of success of reintroductions can be attributed to several factors. Relocated tortoises often attempt to return to their home ranges (Blythe et al. 2004) and they face increased vulnerability to predators and potential antagonistic responses from resident tortoises. Perhaps the largest problem facing potential relocation efforts is the potential for the spread of diseases, especially upper respiratory tract disease, and genetic pollution.

Recently, upper respiratory tract disease has been found to be a significant contributor to tortoise mortality, and this disease is widespread in the Mojave population. Upper respiratory tract disease is caused by a bacterium (*Mycoplasma agassizii*), and it may be aggravated by simultaneous infections from other bacteria. Upper respiratory tract disease has been reported in a variety of tortoise species from around the world. It is likely that it has been spread through the wild populations by the release of infected, captive tortoises (Jacobson 1993). One of the main reasons for the emergency listing of Mojave Desert Tortoises in 1999 was the observed die-offs of populations due to upper respiratory tract disease.

Groundwater withdrawal may cause the development of large fissures (Koehn Dry Lake, Saltdale, California) which act as pit-fall traps that can capture tortoises. Tortoises can also be trapped in utility trenches. Railroad tracks fragment tortoise habitat and their movements may be constrained by train rails (Edwards et al. 2004; 59 FR 5820-5866).

Species in the Project Area

A small Desert Tortoise population is known to exist approximately 25 miles to the northwest of the Project area near Beatty, NV. Desert Tortoise surveys conducted in 2006 (Knight and Leavitt 2006) and in 2007 (Converse Consultants 2008) for proposed mining operations, indicate population densities of 0-10 tortoise per square mile. The DOE, Nevada Test Site is located northeast of the Project, and has been extensively surveyed for Desert Tortoise over many years (Rautenstrauch and O'Farrell 1994). These surveys have indicated low to very low densities of Desert Tortoise.

To the south and east of the Project site, in the Pahrump Valley and an area known as Johnny, surveys were conducted over years that also indicated low densities of Desert Tortoise (Tierra Data 2009).

Desert Tortoise surveys were conducted within the footprint of the proposed Project from late March through May, 2009. Four Class 4 burrows were observed on the 7,670 acres surveyed during a time when tortoises would have been most active (Figure 3-12). Class 4 burrows are burrows with deteriorated condition that may have been used by Desert Tortoise. No dead or live tortoises were observed nor were any shells, scutes or bone segments of dead tortoise detected in washes or ponding areas during high water events. Generally, even if no other tortoise sign is detected during survey activities, tortoise remains can be found in washes (Tierra Data 2009).

Devils Hole Pupfish

Regulatory Status

The Devils Hole Pupfish (*Cyprinodon diabolis*) was listed by the USFWS as an endangered species on March 11, 1967 (32 FR 4001). The species was listed as critically endangered by the State of Nevada on January 1, 1969 (USFWS 1980). The species is currently listed as a protected species by the State of Nevada (NNHP 2009).

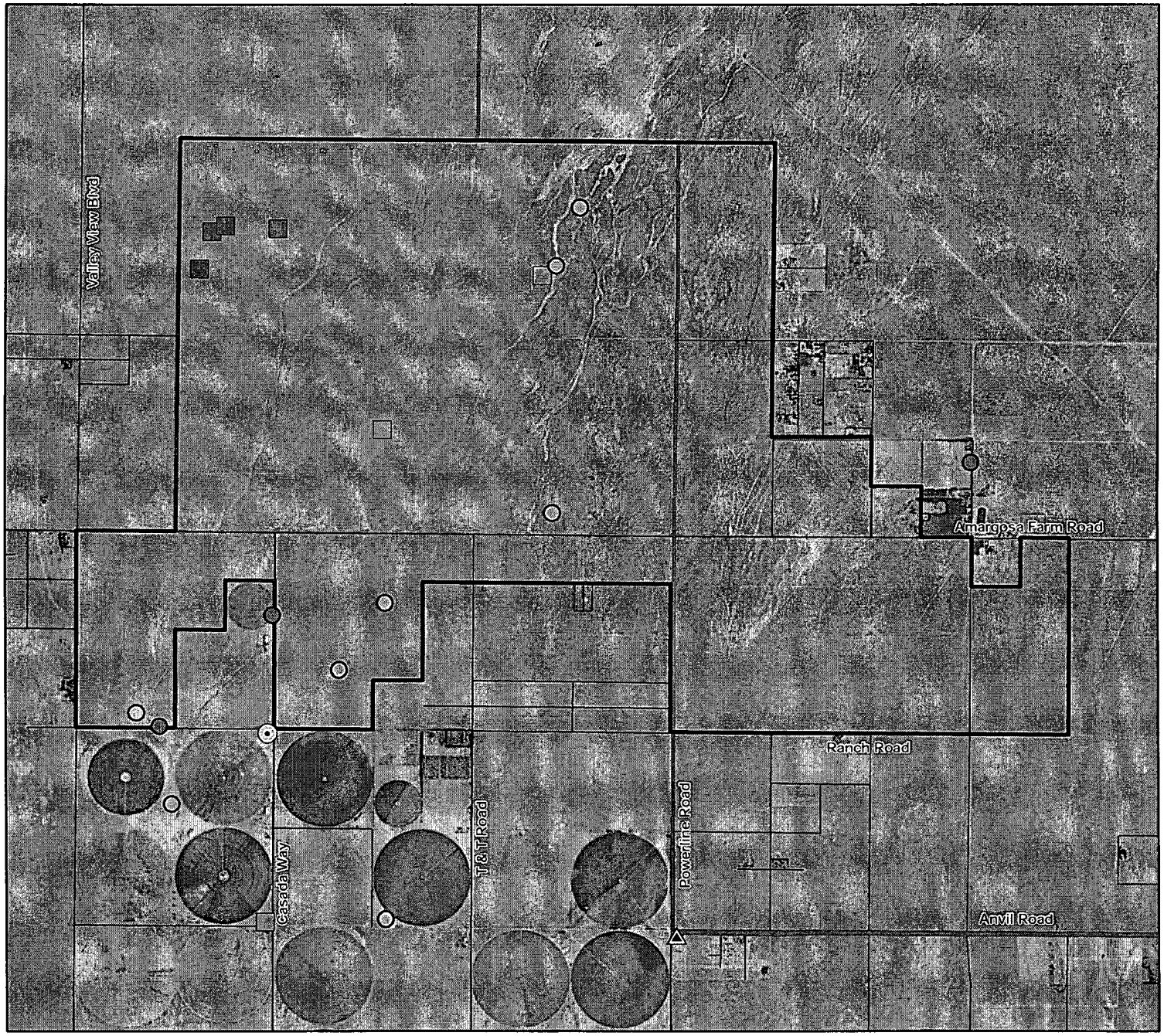
Maintaining the water level of Devils Hole is critical to the survival of the species. In 1976, the U.S. Supreme Court upheld the rights of the NPS to maintain the water levels at Devils Hole at no more than 2.7 feet below the copper marker (a copper washer in the wall of Devils Hole) over the water right holders in the vicinity of Devils Hole (Cappaert vs. U.S., 426 U.S. 128 [1976]; USFWS 1980; USFWS 1990).

Species Description

The Devils Hole Pupfish is among the smallest of the pupfish species reaching a maximum length of 0.98 inches. The body shape is similar to that of other pupfish as it possesses a large head and eyes and a long anal fin. However, this species lacks pelvic fins and vertical bars that are typical in other *Cyprinodon* species. The male Devils Hole Pupfish is typically a pale blue color with breeding males becoming a solid dark blue with a black terminal band on the caudal fin, violet gill covers, and a brownish to silver colored back. The females lack ocellus on their dorsal fin and are colored yellowish-brown along the back (Baugh and Deacon 1983; USFWS 1990, 2009b, 2009e).

Status and Distribution

This species is endemic to a single limestone cave called Devils Hole, which is located at the east-central boundary of the Ash Meadows NWR. The species has been isolated from other pupfish for an estimated 10,000 – 20,000 years (Soltz and Naiman 1978), and has always been small in numbers fluctuating from a maximum of 553 fish in the summer to a minimum of 127 fish in the winter (USFWS 1990). The population reached a low of 38 individuals in 2006 for reasons that are not clear (Hillyard and Van Breukelen 2009), but it appears the decline is not correlated with declining water levels. However, studies are on-going to determine what may be impacting the species (Wilson et al. 2009).



Amargosa Farm Road Solar Energy Project (NVN-84359)

Sensitive Wildlife Species Figure 3-12

LEGEND

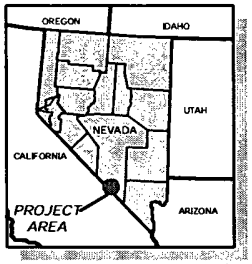
- Project Area

Species Detected

- Desert Tortoise burrow (unoccupied)
- Burrowing Owl
- Burrowing Owl burrow (unoccupied)
- Prairie Falcon
- LeConte's Thrasher

General Reference Features

- Proposed Project Well
- Substation
- Existing Transmission Line (<230kV)
- Local Road



Source: Species Data - TierraData, 2009; Wells - Nevada State Engineer, 2008; Transmission Line, Substation - Platts, 2009; Local Roads - TerraSpectra Geomatics, 2009; Imagery - ESRI, 2009

September 2010

0 0.5 1 Miles

Small refugium populations have been established in the Amargosa Pupfish Station in Ash Meadows NWR and in facilities constructed by the Bureau of Reclamation located near the base of Hoover Dam along the Colorado River (USFWS 1990). Despite these efforts, none of the refugia were able to sustain a viable population of Devils Hole pupfish and no longer remain active (Mapula et al. 2009).

Life History

The species inhabits the limestone cave known as Devils Hole. Essential habitat for this species encompasses 21,760 acres of the area where groundwater removal most influences the water level in Devils Hole. This extends northwest of Devils Hole to within approximately 8 miles of the Project area. This species is highly dependent upon a limestone shelf where feeding and spawning are focused. This shelf can become unusable to the pupfish should the water level drop too low (Soltz and Naiman 1978). The Devils Hole Pupfish is an opportunistic feeder. During the fall and summer months, the pupfish primarily feeds on diatoms, but also feeds on algae (*Spirogyra*) and invertebrates such as amphipods, ostracods, and protozoa. Less frequent food items include beetles (*Stenelmis* sp.), a turbellarians (*Dugesia* sp.), and snails (*Tryonia* sp.) (Baugh and Deacon 1983; USFWS 1990).

Spawning occurs year-round due to the relatively constant water temperature of 32°C maintained in Devils Hole (Baugh and Deacon 1983). Spawning peaks in the spring during the maximum photoperiod (USFWS 1990), and eggs are fertilized when deposited onto a limestone substrate ledge where they incubate (Baugh and Deacon 1983; USFWS 1990).

Threats to the Species

The primary threat to the Devils Hole Pupfish is decreased water levels in Devils Hole due to pumping of surface and groundwaters for agriculture and other activities in the Amargosa Valley (USFWS 1980). By the late 1960s, ranching in the area altered most springs with heavy machinery, cleared extensive areas of riparian and marsh vegetation, decreased spring discharge by pumping surface and groundwaters, diverting water into earthen and concrete-lined ditches, and impounding waters. The population of the Devils Hole Pupfish declined to fewer than 150 individuals following these activities (USFWS 1980).

Much of the spawning and foraging activities of the pupfish occurs within 6.5 by 13 foot ledge. If water levels drop below that ledge, the Devils Hole Pupfish could suffer extreme population declines.

Species in the Project Area

The Devils Hole Pupfish does not occur within the Project area. The entire population is known only from Devils Hole which is located approximately 12.5 miles southeast from the edge of the Project area. Devils Hole and the Project area are located within the Nevada portion of the Amargosa Desert Hydrographic Basin (#230), which is a part of the Death Valley Hydrographic Region (#14).

Ash Meadows Amargosa Pupfish

Regulatory Status

The Ash Meadows Amargosa Pupfish (*Cyprinodon nevadensis mionectes*) was emergency listed as endangered on May 10, 1982 (47 FR 19995-19999). This listing was in effect until January 5, 1983 at which time a second emergency listing and a proposal of endangered status with critical habitat were published concurrently (48 FR 608-625). A determination of endangered status and critical habitat was published on September 2, 1983 (48 FR 40178-40186). Critical habitat was designated at Fairbanks, Rogers, and Longstreet Springs and three unnamed springs in the northwest corner of Section 23, T17S, R50E; Bradford, Jackrabbit, Big, and Point of Rocks Springs; Crystal Pool; and their outflows areas. All critical habitat for this subspecies is located within the Ash Meadows NWR (48 FR 40178-40186). The species is listed as a protected species by the State of Nevada (NNHP 2009).

Species Description

The Ash Meadows Amargosa Pupfish is a short, deep, slab-sided fish with a long head and strongly arched nape. This subspecies has low fin-ray and scale counts relative to other *Cyprinodon* species. The breeding males are iridescent silver-blue with a yellowish-olive color along the back anterior to the dorsal fin (Soltz and Naiman 1978).

Status and Distribution

The Ash Meadows Amargosa Pupfish tends to occupy relatively large habitats that are 14.5 to 79 feet in diameter and are relatively warm with constant temperatures of 24 to 30°C (Soltz and Naiman 1978). The subspecies is known to have been extirpated from Bole, Deep, and Forest Springs (48 FR 40178-40186). In 1990, this subspecies was known to occupy 10 spring areas and was established in clay ponds within Ash Meadows NWR. Population estimates from June 1982 reported 568 individuals from Jackrabbit Spring and 1,189 individuals from Big Spring. Estimates from July 1983 reported 1,189 individuals from Jackrabbit Spring and 1,822 from Big Spring (USFWS 1990).

Surveys were conducted between fall 2007 and summer 2008. These surveys resulted in a minimum population of 5,635 individuals captured in the winter of 2008. The highest number of individuals was detected in the summer of 2008 resulting in 8,346 individuals within the Ash Meadows NWR. The largest populations were consistently located in the Crystal and Fairbanks Springs systems in addition to the outflow from Peterson Reservoir. Additional large populations were located in the Kings, Jackrabbit, Big, and Longstreet Springs (USGS 2008).

Life History

Like other pupfish, the Ash Meadows Amargosa Pupfish is omnivorous, a subspecies thought to be similar to that of the Amargosa Pupfish (*C. n. amargosae*) which also feeds primarily on a mixture of algae and detritus throughout the year. Small invertebrates are consumed opportunistically (Naiman 1979).

Spawning typically occurs from February to September, but can occur year-round when conditions are suitable. Spawning peaks in the spring with females depositing one or two eggs at a time in a substrate of silt, sand, detritus, and/or algae (Soltz and Naiman 1978).

Threats to the Species

The subspecies is endemic to a very small area that is dependent upon the integrity of the Ash Meadows ecosystem including undisturbed flows from the Ash Meadows basin aquifer. Alteration of surface and groundwater flows could greatly impact the pupfish's population survival or growth (48 FR 40178-40186).

Introduction of non-native predatory organisms such as Largemouth Bass (*Micropterus salmoides*), Red Swamp Crayfish (*Procumbarus clarkii*), and Bullfrog (*Rana catesbeiana*) are an additional threat because these exotics are known predators of the Ash Meadows Amargosa Pupfish. Other introduced species such as the Sailfin Mollie (*Poecilia latipinna*), Convict Cichlid (*Archocentrus nigrofasciatus*), and Mosquitofish (*Gambusia affinis*) are known to outcompete and replace the pupfish (48 FR 40178-40186; USGS 2008). Intensive efforts to remove Sailfin Mollies and Convict Cichlids were undertaken in 2008, and based on the most recent surveys, have failed to capture either of these species indicating removal efforts may have been successful (USGS 2008; McKelvey and Taylor 2009).

Species in the Project Area

The Ash Meadows Amargosa Pupfish does not occur within the Project area. Its known range is located within the Amargosa Desert Hydrographic Basin (#230). The Project area is also located within the Nevada portion of this Basin, which is a part of the Death Valley Hydrographic Region (#14). Fairbanks Spring is the closest known population of Ash Meadows Amargosa pupfish to the Project area. It is located approximately 8 miles southeast from the edge of the Project area.

Warm Springs Pupfish

Regulatory Status

The Warm Springs Pupfish (*Cyprinodon nevadensis pectoralis*) was listed as endangered without critical habitat on October 13, 1970 (35 FR 16047-16048). The species is listed as a protected species by the State of Nevada (NNHP 2009). Essential habitat includes all known populations and is located entirely within the Ash Meadows NWR (USFWS 2009b). Essential habitat includes the area in which groundwater pumping is most likely to have an adverse affect to the discharge of Warm Springs (USFWS 1990).

Species Description

The Warm Springs Pupfish is the smallest of the subspecies of pupfish, with a shorter, deeper body and more numerous pectoral fin rays and displays the strongest tendency towards reduction

and loss of pelvic fins. Breeding males appear similar to the Ash Meadows Amargosa Pupfish with readily seen yellow on the nape (Soltz and Naiman 1978).

Status and Distribution

Warm Springs Pupfish habitat is relatively small, the water is less than 6.5 feet in diameter and 4 feet deep and is relatively warm with constant temperatures of 30 to 33°C (Soltz and Naiman 1978). This pupfish is isolated from other subspecies; found only in the Warm Springs Complex of Ash Meadows NWR. These springs have been isolated from other water bodies for several hundred years. This pupfish historically occupied seven springs within the complex, but one such spring (Mexican Spring) dried up in 1973 and is no longer inhabited (Soltz and Naiman 1978). Currently, the Warm Springs Pupfish occupies North Scruggs, South Scruggs, Marsh, North Indian, South Indian and School Springs (Sada and Mozejko 1984).

Surveys were conducted between fall 2007 and summer 2008. These surveys revealed a minimum population of 322 individuals captured in the spring of 2008. The highest number of individuals was detected in the fall of 2007 revealing 765 individuals within the Ash Meadows NWR. The School Springs underwent restoration during the survey period and was not surveyed completely, which may account for the low numbers found during the two seasons, as this spring complex showed the largest numbers prior to initiation of restoration work. Also, during restoration, exotic species such as Red Swamp Crayfish and Mosquitofish (*Gambusia affinis*) were eradicated, after which pupfish numbers increased at Warm Springs (USGS 2008).

Life History

Like other pupfish, the Warm Springs Pupfish is omnivorous, and is thought to be similar to that of the Amargosa Pupfish (*C. n. amargosae*) which feeds primarily on a mixture of algae and detritus throughout the year. Small invertebrates are consumed opportunistically (Naiman 1979).

Spawning typically occurs from February to September, but can occur year-round when conditions are suitable. Spawning peaks in the spring with females depositing one or two eggs at a time in a substrate of silt, sand, detritus, and/or algae (Soltz and Naiman 1978).

Threats to the Species

This pupfish is endemic to a very small area that is dependent upon the integrity of the Ash Meadows ecosystem including undisturbed flows from the Ash Meadows basin aquifer into the Warm Spring Complex. Alteration of surface and groundwater flows could greatly impact the Warm Springs Pupfish population survival or growth (USFWS 1990).

Introduction of nonnative predatory organisms to pupfish habitat such as Mosquitofish, Red Swamp Crayfish, and Bullfrog are an additional threat. These species, in particular, are known to prey upon and/or out-compete the Warm Springs pupfish (USFWS 1990). Intensive efforts to remove Mosquitofish and Red Swamp Crayfish from the School Springs system were undertaken in January 2008. Surveys following eradication of these species indicate an increase in Warm Springs Pupfish populations in addition to confirming complete eradication of Red Swamp

Crayfish and Mosquitofish (USGS 2008). A major goal of Ash Meadows NWR is the continued eradication of Red Swamp Crayfish and Mosquitofish from the Warm Springs Complex in 2009-2010 including from the North and South Indian Springs. If these goals are achieved, only one spring system within the Warm Springs Complex (the South Scruggs Spring system) will contain these non-native invasive species (Weissenfluh et al. 2009).

Species in the Project Area

The Warm Springs Pupfish does not occur within the Project area. Its known range is located within the Amargosa Desert Hydrographic Basin (#230). The Project area is also located within the Nevada portion of this Basin, which is a part of the Death Valley Hydrographic Region (#14). The entire population is only known from the Warm Springs Complex located approximately 11 miles southeast from the edge of the Project area.

Ash Meadows Speckled Dace

Regulatory Status

The Ash Meadows Speckled Dace (*Rhinichthys osculus nevadensis*) was emergency listed as endangered on May 10, 1982 (47 FR 19995-19999). This emergency listing was in effect until January 5, 1983 at which time a second emergency listing and proposal of endangered status with critical habitat were published concurrently (48 FR 608-625). A determination of endangered status with designated critical habitat was published on September 2, 1983 (48 FR 40178-40186), which included Bradford Springs, Jackrabbit Spring, Big Spring, and their outflows, all of which are located within the Ash Meadows NWR (48 FR 40178-40186). The species is currently listed as a protected species by the State of Nevada (NNHP 2009).

Species Description

The Ash Meadows Speckled Dace is a small fish with a maximum length of 3.9 inches and varies widely in their coloration. Typically the dorsum is olive-gray that blends ventrally to a golden color (USFWS 1990). The subspecies has black speckles and splotches covering the body with one or two distinct lateral stripes (Soltz and Naiman 1978; USFWS 1990). The degree of speckling and completeness of the lateral stripes varies between the isolated populations. It has a slightly overhung snout and small fins (Soltz and Naiman 1978).

Status and Distribution

The Ash Meadows Speckled Dace is thought to have historically occupied the same springs and outflows as Ash Meadows Amargosa Pupfish, which tends to occupy relatively large habitats that are 14.5 to 79 feet in diameter and are relatively warm with constant temperatures of 24 to 30°C (Soltz and Naiman 1978; USFWS 1990). In 1990, this fish was known to occupy four springs within Ash Meadows NWR, including Bradford, Big, Tubbs, and Jackrabbit Springs. Population surveys were conducted in June 1982 and July 1983 that resulted in an estimated total population of 500 individuals within Ash Meadows NWR (USFWS 1990).

Surveys were conducted between fall 2007 and summer 2008. These surveys revealed a minimum population of 1,009 individuals captured in the summer of 2008. The highest number of individuals was detected in the winter of 2008 revealing 1,552 individuals within the Ash Meadows NWR. Ash Meadows Speckled Dace were located in five spring complexes including, Bradford 1 Spring, Bradford 2 Spring, Forest Spring, Jackrabbit Spring, and Point of Rocks Spring. Point of Rocks and Forest Springs each resulted in fewer than 10 individuals during each survey period. The two systems with the highest population sizes were Bradford 1 Spring and Jackrabbit Spring. Surveys in Big and Tubbs Springs, which historically maintained populations of Ash Meadows Speckled Dace, failed to locate any individuals (USGS 2008).

Life History

Like other speckled dace, the Ash Meadows Speckled Dace is omnivorous, feeding on bottom surfaces for insect larvae, crustaceans, diatoms, snails, and algae as would be expected from its downward-shaped mouth (Soltz and Naiman 1978). Occasionally mid-water or surface food or insects will be consumed (USFWS 1990).

Spawning primarily occurs during the spring but a second spawning can occur in the summer. Spawning occurs over stream riffles where eggs are fertilized as they drift into the substrate (Soltz and Naiman 1978; USFWS 1990).

Threats to the Species

The subspecies is endemic to a very small area that is dependent upon the integrity of the Ash Meadows ecosystem including undisturbed flows from the Ash Meadows basin aquifer. Alteration of surface and groundwater flows could greatly impact the Ash Meadows Speckled Dace population survival or growth (USFWS 1990).

Introduction of nonnative invasive organisms to the habitat such as Largemouth Bass, Mosquitofish, Red Swamp Crayfish, and Bullfrogs is an additional threat. These species, in particular, are known to prey upon and/or outcompete the Ash Meadows Speckled Dace (USFWS 1990; USGS 2008). Intensive efforts to remove Largemouth Bass, Mosquitofish and Red Swamp Crayfish from the southern springs have been ongoing since the 1990s and more intensive during 2007 and 2008 (USGS 2008). Current restoration efforts at Fairbanks and Soda Springs are expected to provide reintroduction opportunities for expanding the current range of the Ash Meadows Speckled Dace into the northern springs of the Ash Meadows NWR from where the speckled dace was historically known (Andress et al. 2009; Bio-West 2009).

Species in the Project Area

The Ash Meadows Speckled Dace does not occur within the Project area. Its known range is located within the Amargosa Desert Hydrographic Basin (#230). The Project area is also located within the Nevada portion of this Basin, which is a part of the Death Valley Hydrographic Region (#14). Bradford Springs is the closest known population of Ash Meadows Amargosa Pupfish to the Project area. It is located approximately 13 miles southeast from the edge of the Project area.

Ash Meadows Naucorid

Regulatory Status

The Ash Meadows naucorid (*Ambrysus amargosus*) was listed as threatened with designated critical habitat on May 20, 1985 (50 FR 20777-20794). Critical habitat includes Point of Rocks Springs and their immediate outflows (50 FR 20787).

Species Description

The Ash Meadows naucorid is a member of the family *Naucoridae* which are commonly called creeping water bugs. The species has an average adult length of 0.24 inches (Parker et al. 2000). The species is a dull brown color with scattered dark yellow markings on the head, thorax, and legs. It is a flightless insect with hind legs modified for swimming and raptorial forelegs for capturing prey (Dominguez 2006).

Status and Distribution

Originally, the Ash Meadows naucorid was only known from an area at Point of Rocks Springs where flowing water passes over rock and pebble substrates (USFWS 1990). Water diverted from Point of Rocks Springs to aid recovery efforts for the Devils Hole Pupfish resulted in a reduction of suitable habitat for the Ash Meadows naucorid. In 1997, Ash Meadows naucorids were introduced into the Kings Pool outflow and later into the channel 16-33 feet below Kings Pool. Additional individuals were added in 1998 to supplement the fledgling population. By 2002, the population of naucorids in Kings Pool was extinct. In February 2009, water which had previously been diverted to the Devils Hole Pupfish refuge was returned to its original flow in the main stream channel at Point of Rocks. This nearly doubled the discharge and expanded the suitable habitat for naucorids. Reintroductions are being proposed to reestablish naucorids throughout their historic range (Parker et al. 2009).

Life History

Naucorids feed by piercing the exoskeleton of invertebrates and sucking out the body fluids. Feeding trials showed that *Hyalella* (amphipods), *Elmidae* larvae, and baetid mayfly nymphs were selected for while elmid beetle adults, snails and flatworms were not consumed (Parker et al. 2000).

Population levels peak in the spring and summer in response to reproduction activities. Fecundity is low with females only producing approximately seven eggs at a time. Selection of oviposition substrate is not clear, however, researchers have noted that eggs have been found on gravel, pebble and cobble substrates as well as from submersed vegetation, but no eggs have been reported from coarse sand or boulder substrates. Ash Meadows naucorids have five nymphal instars. Individuals may overwinter as adults or late instar nymphs (Parker et al. 2000).

Threats to the Species

The Ash Meadows naucorid is endemic to a very small area that is dependent upon the integrity of the Ash Meadows ecosystem including undisturbed flows from the Ash Meadows basin aquifer. Its current range is greatly reduced from its known historic range due to channelization of the springs' outflow for agricultural diversion in addition to other flow-restricting alterations made at Point of Rocks Springs. Alteration of surface and groundwater flows could impact the Ash Meadows naucorid population survival or growth by decreasing spring discharge (50 FR 20782).

Species in the Project Area

The Ash Meadows naucorid does not occur within the Project area. Its known range is located within the Amargosa Desert Hydrographic Basin (#230). The Project area is also located within the Nevada portion of this Basin, which is a part of the Death Valley Hydrographic Region (#14). The entire population is only known from Point of Rocks Spring located approximately 15 miles southeast from the edge of the Project area.

3.6.5.3 Other Sensitive Species

Several wildlife species of concern were acknowledged by BLM and NDOW as warranting special consideration in this EIS. They are briefly discussed below.

Reptiles

There are two reptile species of concern. The Desert Iguana is on the NNHP Plant and Animal Watch List, which means it is vulnerable to decline by habitat loss. The Project area consists of potentially suitable habitat for the Desert Iguana such as creosote bush on sandy soils. The second reptile that has been identified as a conservation priority species is the Nevada Shovel-nosed Snake. The Project area consists of suitable habitat for this species such as dry desert washes and sparse vegetation.

Amphibians

Two sensitive species of amphibians naturally occur in Nye County. The Amargosa Toad (*Bufo nelsoni*) is largely restricted to the Amargosa River around the towns of Springdale and Beatty, Nevada (Stebbins 1985). Although it may be found in a few other subsidiary creeks, none of them flow through the Project area. The southern end of the Amargosa Toad's range is in the Oasis Valley near Beatty, approximately 25 miles north of the Project area. Additionally, due to the lack of any permanent water within the Project area this species is not expected nor was it found within the Project area (Tierra Data 2009).

The Columbia Spotted Frog (*Rana luteiventris*) is also known from Nye County. However, the southern end of the range of the Columbia Spotted Frog extends to Cloverdale Creek located over 100 miles north of the Project area (Toiyabe Spotted Frog Technical Team 2004).

Birds

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act. No suitable nesting or roosting habitat was located within the Project area. Eagles have been known to occur at the Ash Meadows NWR; however, these occurrences are occasional and irregular (Las Vegas Audubon Society 1997). When Bald Eagles are sighted in the NWR, they are only known to use the NWR as a stop-over during seasonal migrations (USFWS 2010). There are no other known areas of occurrence or suitable nesting/roosting habitat located within 10 miles of the Project area.

Swainson's Hawk is considered a sensitive species by the BLM Nevada office and is a protected species under Nevada state law. Five Swainson's Hawks were observed at the southwestern corner of the Project area, perched in and adjacent to the alfalfa field located immediately south of the Project area. These hawks were apparently feeding on large insects, such as grasshoppers, available in the field. This species is strongly migratory, and was not seen again on the Project area during the spring surveys.

Prairie Falcon is considered a sensitive species by the BLM Nevada office and is a protected species under Nevada state law. Prairie Falcons were observed three times during the 2009 surveys, always perched on telephone poles adjacent to agricultural fields (see Figure 3-12). It is likely that these agricultural fields regularly attract local Prairie Falcons, due to the increased number of prey available there. Desert habitats support relatively lower numbers of prey and would be utilized by raptors for hunting much less frequently than agricultural fields.

LeConte's Thrasher is considered a sensitive species by the BLM Nevada office and is a protected species under Nevada state law. LeConte's Thrashers were observed on three occasions during the surveys (see Figure 3-12). These observations included adults in addition to recently fledged young. LeConte's Thrasher naturally occurs at low densities, and since the entire site is potential habitat, it is possible that a small number of pairs are present throughout the site.

Phainopepla (*Phainopepla nitens*) is considered a sensitive species by the BLM Nevada office and is a protected species under Nevada state law. No suitable nesting habitat was observed within the Project area. During the spring 2009 survey, a single Phainopepla was observed perched on a tamarisk tree in a residential area along the eastern edge of the Project area.

Burrowing Owl is considered a sensitive species by the BLM Nevada office and is a protected species under Nevada state law. Two burrows previously occupied by owls were located during the 2009 surveys within the Project area (see Figure 3-12). Both of these burrow complexes had not been occupied in some time, as there were spider webs and debris in the entrances, very old whitewash, and bleached rodent bones and old pellets. No fresh pellets or feathers or prey remains were found, which suggests occupancy by wintering owls. It would be expected that the majority of owls using this area would be wintering owls, and a minority would remain to breed. Given the low productivity of the desert at this site, in terms of the very sparse vegetation and low insect and rodent populations, the only areas that are suitable for supporting breeding owls are those adjacent to the irrigated alfalfa fields.

A local resident identified an occupied Burrowing Owl burrow 1 mile south of the Project area along Casada Road in a residential lot adjacent to an alfalfa field (see Figure 3-12). One owl was observed during the visit, though the resident said that a pair of owls had fledged several young earlier in the year. In general, a low density of wintering owls could potentially occur throughout the Project area where there are suitable burrows. Breeding Burrowing Owls are most likely to be located adjacent to the alfalfa fields, where the prey base is significantly more abundant than the surrounding desert.

Focused surveys failed to observe or detect Bendire's Thrasher (*Toxostoma bendirei*) or Loggerhead Shrike (*Lanius ludovicianus*) in the Project area.

Bats

Six bat species were detected within the Project area. All six species are special status species. These are listed in Table 3-17. The majority of these bat species are found throughout Nevada, the exception being Yuma Myotis which is known from the southern and western half of Nevada. Except for the Brazilian Free-tailed Bat, these species are year-round residents that hibernate in the winter, rousing periodically to actively forage or drink. The Brazilian Free-tailed Bat is a summer resident that migrates to South America during the winter. These species utilize many different types of roosts, including mines, caves, buildings, rocks, hollow trees, bridges, vegetation, and exfoliating bark, although no roosting habitat was found in the Project area. All six species are invertevores, consuming moths, arthropods, flies, beetles, and aquatic insects (Bradley et al. 2006). Based on the positive results of the anabat survey, there is suitable foraging habitat for the bats in the Project and surrounding area.

3.7 HISTORIC AND CULTURAL RESOURCES

This section of the EIS addresses cultural resources, including the results of a cultural resource study that was completed in support of the proposed Project (Thompson et al. 2009).

3.7.1 Regulatory Framework

Section 106 of the NHPA, 16 USC § 470 requires federal agencies to take into account the effects of their undertakings on historic properties. For the purposes of Section 106, historic properties are defined as including prehistoric and historic sites, buildings, structures, districts, landscapes, and objects included in or eligible for inclusion in the NRHP, as well as artifacts, records, and remains related to such properties (National Register Bulletin 36). Historic properties can also include those cultural resources that are associated with the cultural practices or beliefs of a living community (National Register Bulletin 38).

3.7.2 Affected Environment

A cultural resource study consisting of a detailed records review and intensive pedestrian survey was conducted in support of the Proposed Action (Thompson et al. 2009). The study was

conducted to identify those cultural resources located within the Project's APE, and make recommendations on their eligibility for listing on the NRHP. These efforts were undertaken to support the preparation of the EIS and meet the BLM's Section 106 responsibilities, as well as to comply with other federal laws and EOs, such as EO Number 13007 (Indian Sacred Sites).

The APE originally encompassed 7,798.24 acres and included the proposed Project's power block, laydown area, office, maintenance building, switchyard, and detention basin. However, the Project size was formally reduced to 5,880 acres by the Proponent after the archaeological inventory was completed. Thirteen new prehistoric and/or historic cultural resource sites were documented within the current Project area. Of the 13 sites, only 1 prehistoric site has been determined eligible for listing on the NRHP under Criterion D. This criterion pertains to this site's potential to yield information important to local and regional prehistory. This site has the potential to be adversely affected by construction of this Project. A Memorandum of Agreement between the BLM and Nevada SHPO will be completed prior to the ROD. The Memorandum of Agreement ensures mitigation would occur prior to any Project implementation involving ground disturbance.

Through coordination with four of the Tribes that have ancestral ties to the Project area, there are no known sacred sites or cultural areas of concern within the Project area. Mitigation of NRHP-eligible site 26Ny13440 through use of the Memorandum of Agreement and the Historic Property Treatment Plant is considered appropriate by the Tribes to ensure that all of the National Register values of this site are retrieved prior to any possible project implementation.

3.8 PALEONTOLOGICAL RESOURCES

Paleontological resources are any fossilized remains, traces, or imprints of organisms that are preserved in the Earth's crust and are of paleontological interest and provide information about the history of life on Earth. Fossil remains may include bones, teeth, shells, leaves, and wood. They are found in geological deposits within which they were originally buried. Paleontological resources include not only the actual fossils, but also the collecting localities and the geological deposits that contain the fossils.

This section presents an overview of the paleontological resources, the location of any known paleontological localities, and the possibility of discovery of fossil resources within the Project area. This section also discusses the regulatory framework for paleontological resources, describes the methods used in the study, and presents a summary of the inventory results. The purpose of this inventory is to identify localities of known significant paleontological resources and to infer where potential significant paleontological resources may be present and potentially affected by construction-related activities.

3.8.1 Regulatory Framework

Federal, state, and local governments have enacted legislation providing for varying degrees of protection for fossil resources. The Society of Vertebrate Paleontology (SVP) regards paleontological resources as "nonrenewable scientific and educational resources that, along with their accompanying contextual data, constitute part of our natural heritage," (SVP 1995).

This paleontological resource inventory was conducted in accordance with the regulations that are applicable to the paleontological resources within the Project area.

3.8.1.1 Federal

The Federal Antiquities Act of 1906 and the PRPA, 16 USC § 470aaa serve as the primary, federal legislation that requires addressing potential impacts to paleontological resources on federally administered lands. The Federal Antiquities Act of 1906 (16 USC §§ 431-433) provides for protection of both historic and prehistoric items on federal land. NEPA (42 USC §§ 4321-4347) directs federal agencies, including the BLM, to fully assess and manage impacts (adverse or not) to the environment. FLPMA (PL 94-579; 43 USC §§ 1701-1782) provides for management and mitigation of adverse impacts on federal land by "protecting the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values." Paleontological resources are viewed as having scientific value and requiring protection under the auspices of FLPMA. The PRPA was enacted as part of the 2009 Omnibus Public Land Management Act and codified specific protection for vertebrate fossil resources and scientifically significant plant and invertebrate fossil resources on federal land. The PRPA created criteria for the issuance of paleontological collection permits and directed the secretary of the interior to ensure that paleontological resources from federal land are properly placed into the collections of approved repository institutions.

3.8.1.2 State

NRS § 381.197 govern the protection of historic and prehistoric sites on state and federal land in Nevada. Per this statute:

> "A person shall not investigate, explore, or excavate an historic or prehistoric site on federal or states lands or remove any object there from unless he is the holder of a valid and current permit issued pursuant to the provisions of NRS §381.195."

NRS §§ 381.195 through 381.219 state that:

> "An applicant is required to secure, from the Museum Director of the Nevada State Museum, or an agent designated by the Museum Director, a permit for the investigation, exploration, or excavation of any state or federal lands within the boundaries of the State of Nevada."

These statutes also define the requirements for the permitting and disposition of any collected paleontological material found on Nevada land.

3.8.1.3 Local

No local protection of paleontological resources is known to pertain to the Project area.

3.8.2 Data Collection Methods

The Project area refers to the area that encompasses the proposed right-of-way and associated components. The ROI for paleontological resources includes a 1-mile buffer around the Project area. Information for the inventory was obtained from a review of the scientific literature and from record searches at paleontological institutions. A review was conducted of relevant published and unpublished geological and paleontological reports, and museum paleontological locality records. Paleontological locality record searches were requested from the Nevada State Museum in Carson City, Nevada, and the San Bernardino County Museum in Redlands, California. Following standard procedure, any known paleontological localities within 1 mile of the Project area were noted. A search for paleontological localities within the ROI was also conducted using records from the University of California, Santa Barbara, Paleobiology Database. The literature and record searches found no paleontological localities within the ROI.

A paleontological resources survey was conducted on February 2 and 3, 2010 in order to determine the nature of the Quaternary-Tertiary marl deposits mapped by Slate et al. (1999) and whether the mapped marl deposits contain paleontological resources.

3.8.2.1 Paleontological Potential

Information about the geological units and known fossil localities in the region was used to identify the paleontological potential of geological units within the Project area. Paleontological potential levels were assigned to each geological unit using the Potential Fossil Yield Classification (PFYC) system that was adopted by the BLM in 2007 for assessing paleontological potential on federal land (BLM Staff 2008). The PFYC system is a five-tiered system that the BLM uses to classify geological units based on the relative abundance of vertebrate fossils or scientifically significant invertebrate and plant fossils and their potential to be adversely impacted, with a higher class number indicating a higher potential. This classification system is applied to the geological formation, member, or other distinguishable map unit, preferably at the most detailed mappable level. This approach was followed in recognition of the direct relationship that exists between paleontological resources and the geological units within which fossils are entombed. By knowing the geology of a particular area and the fossil productivity of particular geological units that occur in the area, it is possible to predict where fossils will likely be found. Each class is defined below:

Class 1. Very Low Potential – geological units not likely to contain recognizable fossil remains. These units include igneous, metamorphic, and Precambrian rocks.

Class 2. Low Potential – sedimentary geological units not likely to contain vertebrate fossils or scientifically significant non-vertebrate fossils; these units include Aeolian, diagenetically altered, and Holocene sediments.

Class 3. Moderate or Unknown Potential – fossiliferous sedimentary geological units where fossil content varies in significance, abundance, and predictable occurrence; sedimentary units of unknown fossil potential. Class 3 is divided into two parts:

Class 3a. Moderate Potential – units are known to contain vertebrate fossils or scientifically significant non-vertebrate fossils, but these occurrences are widely scattered; common invertebrate or plant fossils may be found in the area.

Class 3b. Unknown Potential – units exhibit geological features and preservational conditions that suggest significant fossils could be present, but little information about the paleontological resources of the unit or area is known. This may indicate the unit or area is poorly studied and field surveys may uncover significant fossils.

Class 4. High Potential – geological units that contain a high occurrence of significant fossils. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability.

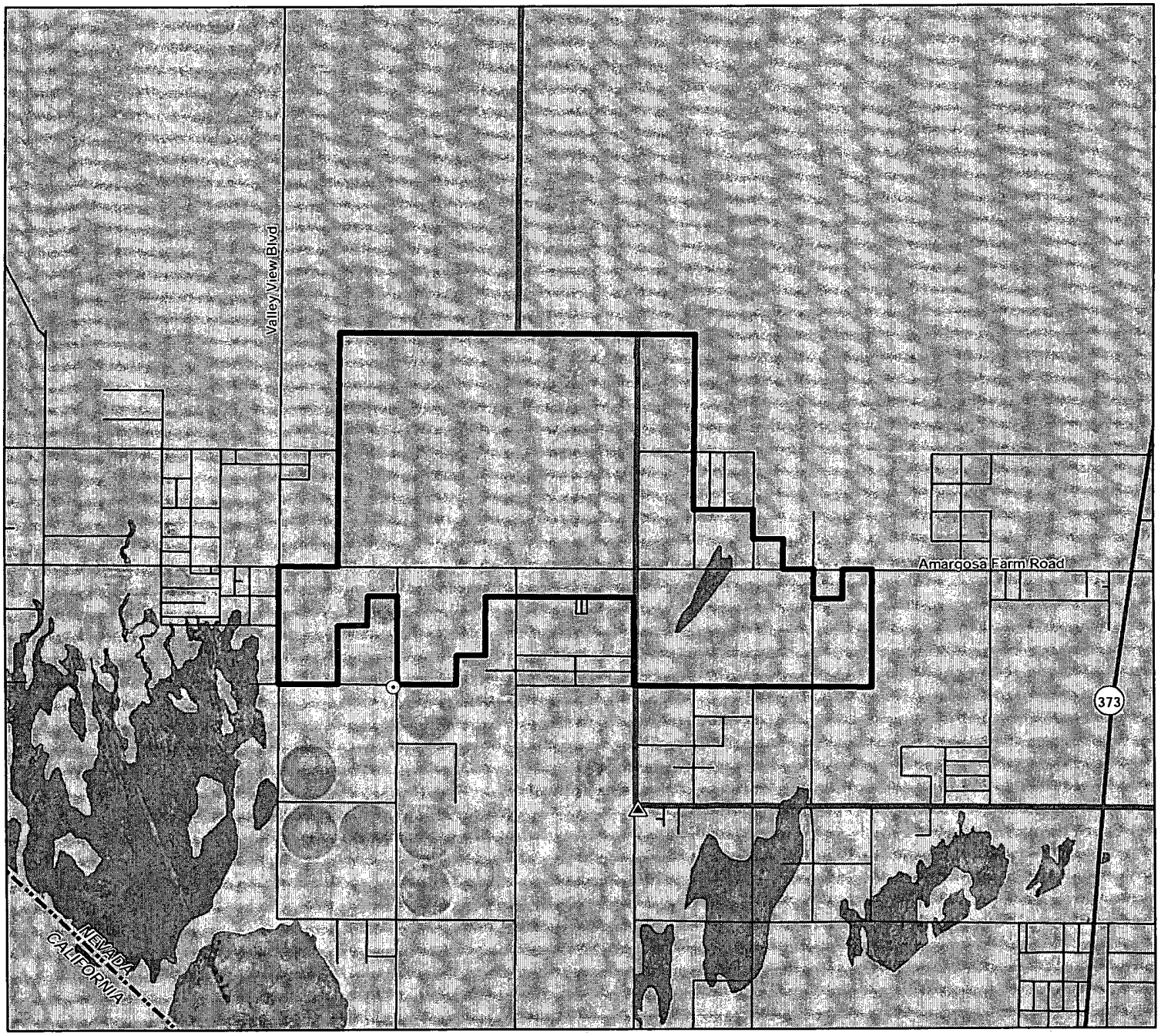
Class 5. Very High Potential – highly fossiliferous geological units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils.

3.8.2.2 Potential for Paleontological Resources in the Project Area

Three geological units have been mapped within the Project area: Young alluvial deposits (Qay), intermediate alluvial deposits (Qai), and Quaternary-Tertiary marl deposits (QTm) (Slate et al. 1999); as discussed previously in the section on geological hazards and mineral resources (see Figure 3-3). Results of the paleontological resources survey, however, determined that there are only two geological units present in the Project area.

Field evidence indicates that the marl deposits exposed in the Project area are not marl or ancient spring deposits as mapped by Slate et al. (1999), but are caliche deposits (another type of limestone deposit) that are part of a paleosol (an ancient soil). Field observations further indicate that these caliche deposits are part of the intermediate alluvial deposits (Qai). Therefore, the only geological units present in the Project area are the young alluvial deposits and the intermediate alluvial deposits. Each of these units has been assigned a PFYC value by the BLM based upon their physical nature, depositional history, probable fossil content, and age (Figure 3-13).

Young alluvial deposits of Holocene age are the youngest geological unit within the Project area. These alluvial deposits have a low potential for paleontological resources and have been assigned a PFYC of 2 as a result of their young age, which decreases the chances of preserving paleontological resources. Intermediate alluvial deposits range in age from the Pleistocene to the early Holocene. Field observations show that caliche deposits are common in the intermediate alluvial deposits. Exposures of caliche deposits in washes and in prospect pits commonly contain fossil root casts and root traces. The root casts and root traces are not considered to be scientifically significant by the BLM. No other fossils were found in the Project area during the paleontological resources survey. The intermediate alluvial deposits have a low potential for paleontological resources and have been assigned a PFYC of 2, because of the alluvial nature of these deposits and the low potential for scientifically significant fossils in the caliche deposits. The slightly older age of these deposits relative to the young alluvial deposits may result in a higher chance of discovering fossil material, but still warrants a PFYC of 2 based on the deposit's overall alluvial nature (Figure 3-13).



Amargosa Farm Road Solar Energy Project (NVN-84359)

Paleontological Resources Figure 3-13

LEGEND

Project Area

Potential Fossil Yield Classification

1 - Very Low Potential

2 - Low Potential

3 - Moderate or Unknown Potential

General Reference Features

Existing Transmission Line (<230kV)

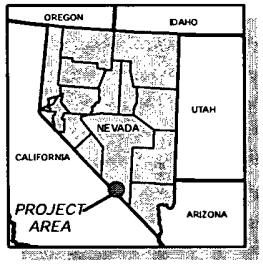
Existing Substation

Proposed Project Well

Highway

Local Road

State Boundary



Source: Geology - USGS, 1999; PFYC - EPG, 2009; Transmission Lines, Substations - Platts, 2009; Wells - Nevada State Engineer, 2008; Roads - TerraSpectra Geomatics 2009; Imagery - ESRI, 2009

September 2010

0 0.8 1.6 Miles

3.9 SOCIOECONOMICS

This section characterizes the existing social and economic conditions within the ROI. The ROI for the socioeconomic analysis is Nye and Clark counties in Nevada, with an emphasis on the communities closest to the Project area, such as Amargosa and Beatty, as well as larger communities within 2 hours of the site, such as Pahrump and Las Vegas.

3.9.1 Data Collection Methods

The socioeconomic inventory describes the following current socioeconomic conditions:

- County and community descriptions
- Demographic and economic characteristics
- Housing, including housing occupancy and average value of homes
- Fiscal revenue and expenditures
- Public infrastructure and services
- Affected groups and their attitudes about the proposed Project

Demographic and economic data are provided for communities located closest to the Project area, as well as communities with a population of over 20,000 within a 2-hour commute of the Project site.

The nearest community with a population over 20,000 is Pahrump, followed by the Las Vegas metropolitan area. Corresponding data for the State of Nevada is included to set the Proposed Action in a regional context. Data were obtained from the U.S. Census Bureau, U.S. Bureau of Labor Statistics, U.S. Bureau of Economic Analysis, Environmental Systems Research Institute (ESRI), and the Nevada State Demographer's Office.

3.9.2 Social Characteristics

3.9.2.1 Population

As shown in Table 3-19, 71.8 percent of Nevada's population is located in Clark County (71.9 percent). In 2000, the population of Clark County was 1,375,765. In 2010, the estimated population is 1,976,256, a 44 percent increase from 2000. Of this total, 96 percent live within the Las Vegas metropolitan area.

In comparison, Nye County's population in 2000 was 32,485. In 2010, the estimated population of Nye County was projected at 47,120, an increase of 45 percent. At 18,159 square miles, Nye County is the third largest county in the continental United States. Located over 100 miles north of the Project area, Tonopah, the county seat, had an estimated population in 2008 of 2,628 (Nevada State Demographers Office 2009). The majority of the county's population is concentrated in the unincorporated city of Pahrump with 34,335 people, approximately 73 percent of the county's population base (ESRI 2010).

Other unincorporated towns near the Project area include: Amargosa Valley with 2,706 people and Beatty with 1,390 people (ESRI 2010). The remaining population is located in isolated private residential areas throughout the county.

Nye County's sparse population can be attributed, in part, to the lack of available private land for development. In fact, 97 percent of the county's land area is administered by the federal government. Of the 11.6 million acres of land in Nye County, approximately 11.3 million acres are administered by the following federal agencies:

- BLM (6.5 million acres; 8,400 acres are jointly managed with the USFWS)
- USFWS (13,700 acres)
- USFS (1.9 million acres)
- U.S. DOD (1.8 million acres)
- DOE (863,000 acres)
- NPS (107,000 acres)
- Bureau of Indian Affairs (8,000 acres)

An additional 19,000 acres are under state jurisdiction, and a total of 249,000 acres in Nye County are privately owned (USFWS 2009f).

Table 3-19 through Table 3-22 summarize the population characteristics for the ROI. In summary the ROI has shown strong growth rates at the community, county, and state levels. Over the last several years Clark County, Nye County, and Nevada have been recognized as the fastest growing populations in the nation. Pahrump is also been one of the fastest growing communities in the nation. Although Amargosa Valley, Beatty, and Pahrump have historically been tied to industries that in recent years have shown some declines in activities (federal government, mining, agriculture), these communities are still projected to grow at modest rates.

- Although population bases in the individual ROI communities have historically been small, these communities have shown modest growth rates (Table 3-19).
- Number of households follows similar growth trends as total population (Table 3-20).
- Highest level of educational attainment for those 25+ years old was fairly consistent across all communities in the ROI and approximately 30 to 40 percent of this population has attained post high school education (Table 3-21).
- The common trend across all communities in the ROI is that a larger percentage of the overall populations are older than 19 years of age (Table 3-22).

Table 3-19 Population and Growth Rates for Communities and Counties in the ROI				
	2000 Census	**2010 ESRI Projection**	**2015 ESRI Projection**	**2010-2015 Annual Growth Rates**
Towns				
Amargosa Valley	1,591	2,706	3,108	+2.81%
Beatty	863	1,390	1,571	+2.48%
Pahrump	24,631	34,335	37,591	+1.83%
Counties				
Nye County	32,485	47,120	52,074	+2.02%
Clark County	1,375,765	1,976,256	2,176,936	+1.95%
Nevada	1,998,257	2,748,294	2,999,160	+1.76%
Source: U.S. Bureau of the Census, 2000 Census of Population and Housing. ESRI forecasts for 2010 and 2015.				

Table 3-20 Households and Growth Rates for Communities and Counties in the ROI				
	2000 Census	**2010 ESRI Projection**	**2015 ESRI Projection**	**2010-2015 Annual Growth Rates**
Towns				
Amargosa Valley	629	1,057	1,219	+2.89%
Beatty	399	643	730	+2.57%
Pahrump	10,153	14,256	15,708	+1.96%
Counties				
Nye County	13,309	19,463	21,652	+2.15%
Clark County	512,253	729,385	801,382	+1.9%
Nevada	751,165	1,025,511	1,116,629	+1.72%
Source: U.S. Bureau of the Census, 2000 Census of Population and Housing. ESRI forecasts for 2010 and 2015.				

Table 3-21 2009 Population 25+ by Educational Attainment for Communities and Counties in the ROI

	Amargosa Valley	Beatty	Pahrump	Nye County	Clark County	Nevada
Total Population 25+ Years	1,641	965	26,242	34,208	1,306,928	1,823,265
Less than 9th Grade	8.4%	2.4%	4.1%	4.1%	7.0%	6.5%
9th–12th No Diploma	16.3%	13.6%	14.0%	13.5%	11.0%	10.5%
High School Graduate	35.3%	53.9%	44.2%	44.5%	32.2%	31.7%
Some College No Degree	19.3%	17.8%	20.5%	20.6%	24.5%	24.9%
Associates Degree	8.2%	4.4%	6.3%	6.2%	6.4%	6.7%
Bachelors Degree	8.2%	4.9%	7.4%	7.5%	12.4%	13.0%
Graduate/Professional Degree	4.3%	3.1%	3.4%	3.5%	6.5%	6.7%

Source: U.S. Bureau of the Census, 2000 Census of Population and Housing. ESRI forecasts for 2009.

Table 3-22 Percent Population by Age for Communities and Counties in the ROI

	2000 Census	2009 ESRI Projections	2014 ESRI Projections	2009–2014 Avg. Annual Growth Rates
Amargosa Valley				
Total Population	1,553	2,529	3,183	+5.1%
Less than 19 years	31.0%	29.0%	27.9%	-0.76%
18+ years	71.7%	73.7%	74.4%	+0.19%
85+ years	0.9%	0.9%	0.9%	0.0%
Beatty				
Total Population	898	1,382	1,706	+4.69%
Less than 19 years	27.9%	25.5%	24.1%	-1.10%
18+ years	74.3%	77.1%	78.1%	+0.26%
85+ years	0.8%	1.6%	1.8%	+2.5%
Pahrump				
Total Population	24,630	35,261	42,216	+3.94%
Less than 19 years	23.9%	21.2%	19.7%	-1.42%
18+ years	77.8%	80.7%	82.0%	-0.17%

Table 3-22 Percent Population by Age for Communities and Counties in the ROI				
	2000 Census	**2009 ESRI Projections**	**2014 ESRI Projections**	**2009–2014 Avg. Annual Growth Rates**
85+ years	0.9%	1.9%	2.3%	+4.21%
Nye County				
Total Population	32,485	47,4129	57,281	+4.15%
Less than 19 years	25.7%	23.0%	21.6%	-1.22%
18+ years	76.3%	79.1%	80.3%	+.30%
85+ years	0.9%	1.7%	2.1%	+4.71%
Clark County				
Total Population	1,375,765	1,974,024	2,295,868	+3.26%
Less than 19 years	28.1%	27.4%	26.8%	-0.44%
18+ years	74.4%	75.2%	75.5%	+0.08%
85+ years	0.8%	1.2%	1.4%	+3.33%
Nevada				
Total Population	1,998,257	2,746,331	3,147,495	+2.92%
Less than 19 years	28.2%	27.2%	26.7%	-0.37%
18+ years	74.4%	75.4%	75.7%	+0.08%
85+ years	0.9%	1.3%	1.4%	1.54%
Source: U.S. Bureau of the Census, 2000 Census of Population and Housing. ESRI forecasts for 2009 and 2014.				

Although Pahrump's population has grown at an average rate of 7.2 percent per year since the mid-1990s, the rest of the county has remained relatively stable, with some towns experiencing a slight decline in population (EDEN 2007). Nye County's historic dependency on the mining sector and activities at the Nevada Test Site has resulted in unstable population growth rates between 1970 and 2002, indicating the need for economic diversification in the county (EDEN 2007).

3.9.2.2 Housing

Table 3-23 and Table 3-24 summarize the housing characteristics of major population centers in the ROI. Housing data was obtained from the U.S. Census Bureau and ESRI. In 2009, the communities of Amargosa Valley and Beatty had relatively high projected rates of vacant houses, 22.7 percent and 26.0 percent, respectively. Overall, the communities and counties in the ROI are projected to expand housing between 3 to 5 percent per year (Table 3-23). The median and average home values in the communities and counties of the ROI are projected to be relatively flat at around 1 to 3 percent increases over the next few years (Table 3-24).

Table 3-23 Housing Units for Communities and Counties in the ROI				
	2000 Census	**2009 ESRI Projections**	**2014 ESRI Projections**	**2009-2014 Avg. Annual Growth Rates**
Amargosa Valley				
Occupied	614	995	1,252	+5.17%
Vacant	178	866	313	+3.53%
Total	792	1,261	1,565	+4.82%
Beatty				
Occupied	384	584	711	+4.35%
Vacant	153	277	339	+4.48%
Total	567	861	1,050	+4.39%
Pahrump				
Occupied	10,53	14,705	17,674	+4.04%
Vacant	1,502	2,141	2,475	+3.12%
Total	11,665	16,846	20,149	+3.92%
Nye County				
Occupied	13,309	19,694	23,305	+3.67%
Vacant	2,625	3,797	4,4049	+3.22%
Total	15,934	23,491	28,305	+4.10%
Clark County				
Occupied	512,253	736,521	855,744	+3.24%
Vacant	47,546	94,166	108,699	+3.09%
Total	559,799	830,687	964,443	+3.22%
Nevada				
Occupied	751,165	1,033,339	1,183,165	+2.90%
Vacant	76,292,	136,330	153,930	+2.58%
Total	827,457	1,169,669	1,337,095	+2.86%
Source: U.S. Bureau of the Census, 2000 Census of Population and Housing. ESRI forecasts for 2009 and 2014.				

Table 3-24 Median Home Values for Communities and Counties in the ROI				
	2000 Census	2009 ESRI Projections	2014 ESRI Projections	2009-2014 Avg. Annual Growth Rates
Amargosa Valley				
Median	$75,833	$106,745	$118,401	+2.18%
Average	$102,212	$143,657	$151,953	+1.15%
Beatty				
Median	$75,000	$105,048	$117,230	+2.32%
Average	$94,788	$120,854	$127,566	+1.11%
Pahrump				
Median	$106,588	$147,182	$168,217	+2.86%
Average	$121,590	$168,094	$185,821	+2.11%
Nye County				
Median	$96,272	$134,415	$151,874	+2.60%
Average	$111,527	$152,968	$168,616	+2.05%
Clark County				
Median	$132,186	$152,591	$156,949	+0.57%
Average	$153,519	$179,723	$184,730	+0.56%
Nevada				
Median	$132,514	$157,802	$164,516	+0.85%
Average	$157,238	$193,653	$202,226	+0.89%
Source: U.S. Bureau of the Census, 2000 Census of Population and Housing. ESRI forecasts for 2009 and 2014.				

Short-term housing is available in the ROI in the form of hotels and motels. In 2009, there were three, one, and five hotels and motels in the communities of Pahrump, Amargosa, and Beatty, respectively. Based on information from the website TravelNevada.com, there are approximately 613 guest rooms among the 9 hotels and motels in these areas. Additional temporary housing is available in communities within 2 hours of the proposed Project site, with many more rooms available in the Las Vegas metropolitan area. Additional housing opportunities are available in the form of recreational vehicle facilities, mobile home sites, and campgrounds.

3.9.2.3 Affected Groups and Attitudes

This section discusses some potential impacts of the proposed Project on particular stakeholder groups. Note that any one person may fit into multiple stakeholder groups. "Stakeholder groups" are people with a shared social position or set of concerns (not necessarily people who interact with one another) who perceive themselves as likely being impacted by the proposed Project. The grouping used emerged from comments made during the scoping process, additional

comments on the Draft EIS, and general social impact assessment practice in relation to public lands. Scoping comments and comments on the Draft EIS provide clues about opinions of each potentially affected stakeholder group. However, they are anecdotal and should be read as such; as there are no available survey data on the groups attitudes toward this Project, or on the attitude of the larger community of which those groups are part.

Immediate Neighbors / Immediate Neighbors with Responsibility for the Health and Safety of Community Residents

Immediate neighbors are residents who dwell in the immediate vicinity of the proposed Project. Survey data show that the owners of the public lands – the United States general population of adults – believe that affected communities should have the most say in public land use (Brunson and Steel 1994). This group includes youth who may be eligible for apprenticeships, jobless adults in search of work, people who are employed, people who run local businesses or practice agriculture, homemakers, and retirees.

Scoping comments indicate that immediate neighbors have varying views towards the proposed Project. The comments also suggest substantial diversity in values and in goals for the community. In general the comments suggest a dominant opinion in favor of renewable energy in general and of solar in particular. There were concerns, though, that their community might disproportionately bear such burdens as: inconvenience, loss of amenities, impacts to visual resources, and a strain on public safety, social, medical, and fire services without receiving compensation through reductions in electricity costs, advantages in jobs, or contributions to community services, facilities, and infrastructure. In terms of jobs, a key concern is whether local people and then regional residents will receive preference in hiring. Finally, there is a generalized local value in favor of not wasting water, which was expressed more strongly with regard to the "wet cooled" alternative.

Volunteer firefighters, the Sheriff's Office, Search and Rescue, and local medical services are included in this group. The key concern expressed by people in this group is that the quality and efficiency of local public services might be undermined by the additional demands likely to be generated during the construction period for the Project. Another concern is that the required construction force cannot be fulfilled locally, such that there is likely to be a substantial influx of construction workers who may be more rowdy after work and place extra demands on the Sheriff's office personnel in contrast to Amargosa Valley's existing, largely senior population.

Outdoor Recreationists

Many Nevada residents are outdoor recreation enthusiasts. OHV use is common, with about 56 percent of Nevada adults riding OHVs at least once a year (Rollins et al. 2007). About 23 percent of Nevada adults go horseback riding at least once a year (Rollins et al. 2007). Local OHV users and horseback riders are accustomed to having easy access to roads and trails on public lands in the Amargosa Valley and vicinity. Local residents who provided scoping comments and comments on the Draft EIS also specifically mentioned camping, photography, hiking, wildlife viewing, and rock hounding as outdoor recreation activities they undertake in the Amargosa Valley. Key concerns of this group have to do with terrain that will be withdrawn

from outdoor recreation use and that access will be reduced between town and public lands that remain in public use.

Environmentalist Groups and Stewards

This group is especially concerned about water use and its impact on wildlife, plants, and the physical structure of the land, with cumulative impacts being of particular concern. Carbon sequestration issues, the possibility of habitat loss, and loss of open space are also concerns. As with other groups discussed in this section the views articulated by the spokespersons for these groups represent the views of their members, not necessarily of a representative sampling of environmental organizations or of a wider public.

Federal, State, and Local Governmental Agencies

Because approximately 97 percent of Nye County is administered by the federal government, most land use activities within the County are subject to federal agency oversight. Federal agency responsibilities for the management and protection of resources within their jurisdiction are myriad within the proposed Project area and the proposed Project's ROI. For example, the development of renewable energy resources, including on lands administered by BLM, is mandated by the EPAct of 2005 and other Federal laws, policies, and programs. FLPMA requires the BLM to ensure the multiple use and sustained yield of the lands it administers, including energy development, conservation, recreation, and other uses.

The protection of water rights for sensitive species within Nye County is one of largest challenges facing development in the area. Within the ROI, the USFWS is tasked with enforcing the provisions of the ESA, including protected species within the Ash Meadows NWR and desert tortoise, throughout their critical habitat area(s), and water use and conservation are key to these efforts. The NPS, in cooperation with the USFWS, is required by the ESA and its own Organic Act to protect and maintain habitat for the endangered Devils Hole pupfish. To ensure protection of critical water levels within Devils Hole and spring flows at Ash Meadows NWR, the USFWS has acquired 57 permitted or certificated water rights totaling 16,908 afy in the Amargosa Desert Hydrographic Area.

Not all restrictions are federal. For instance, the Nevada State Engineer has the authority to approve and control the amount of groundwater pumped within the Amargosa Basin. Due to concerns about decreased water levels at Devils Hole, water use within a 15-mile radius of Devils Hole is subject to Nevada State Engineer Order 1197 (see Section 3.3), which restricts where and how much groundwater may be extracted.

These mandates, restrictions, and policies sometimes conflict, or are perceived to conflict, with local government and private development goals and objectives. For example, Nye County recently (July 28, 2010) updated its Comprehensive Plan to include the following language to address potential changes in the management of public lands:

Nye County needs to address public lands within the County and changes in public land management policies. Goals, objectives, and polices are needed to protect the health, welfare, and economic well-being of the County and those residents whose livelihoods and way of life are dependent on public land policies. Nye County citizens must be protected from federal rules and regulations which conflict with local customs, laws, and decisions of the court and which adversely impact the economy and tax base of Nye County.

A decision to grant a right-of-way for the proposed Project not only would be consistent with Nye County's desire to avoid "adversely impact[ing] the economy and tax base" of the County, but would affirmatively benefit the County's "economic well-being." Indeed, such a decision would serve to at least partly offset any adverse impacts to economic development caused by applicable federal and state legal restrictions and responsibilities. For example, to the extent the proposed Project would result in the retirement of existing water rights under federal and/or state law, the Project also would provide substantial benefits. Moreover, given the obligations of federal and state agencies in the County, particularly with regard to water use and sensitive species, the agencies would be required to evaluate any development requiring more than minimal water use in light of the same restrictions, such that any such development likely would face similar restrictions. Of course, federal agency decisions may not fully comply or synchronize with local goals and objectives. Providing for public review and comment periods and cooperating agency status to appropriate governmental entities enables BLM and other agencies to consider any such differences and, where possible and appropriate, seek to minimize them.

3.9.3 Economic Characteristics

The economy of Nye County has historically been supported by mining, agriculture, railroad operations, and federal defense research and development activities. Mining and agriculture have been the dominant economic activities in Nye County and continue as a source of income; however, the relative importance of agriculture and mining has decreased in recent decades. Both sectors are still important in the local economy but constitute a smaller share of employment and personal income sources. The historic economy has also been characterized by the "bust and boom" cycles of a mining economy, as shown by periods of high population growth, no population growth, and population declines.

Table 3-25 summarizes the labor force characteristics of the State of Nevada and Clark and Nye counties. The table includes state labor force data to provide a regional context for the county labor force data. Unemployment rates steadily declined between 1990 and 2008 for the State of Nevada and Clark and Nye counties, but recently rates have increased due to the economic slowdowns.

Table 3-25 Labor Force Characteristics of the State of Nevada, Clark County, and Nye County – 1990 Through 2008

	Nevada		Clark County		Nye County	
Year	**1990**	**2008**	**1990**	**2008**	**1990**	**2008**
Labor Force	655,896	1,373,462	407,763	987,998	8,945	17,764
Employment	622,516	1,282,012	387,881	922,878	8,616	16,036
Unemployment	33,380	91,450	19,882	65,120	329	1,728
Unemployment Rate	5.1%	6.7%	4.9%	6.6%	3.7%	9.7%

Source: NV Dept of Employment, Training and Rehabilitation – Research and Analysis Bureau 2009

While agriculture and mining activity have decreased in Nye County, these industries are still important basic industries in that they bring money into the county economy through sales to non-local businesses and individuals. The county's agricultural industry produced cash receipts of $23.8 million in 2007 (most recent available data) (USDA National Agricultural Statistics Service 2009). The predominant industry employer for all ROI communities and counties is the service sector. The small rural communities of Amargosa Valley and Beatty also have a strong presence of Agriculture and Mining (Table 3-26). Nearly one-half of all jobs in each ROI community or county are classified as white collar or professional occupations (Table 3-27).

Table 3-26 2009 Employed Population 16+ Years of Age by Industry for Communities and Counties in the ROI

	Amargosa Valley	Beatty	Pahrump	Nye County	Clark County	Nevada
Total Employment	905	569	10,846	15,417	823,682	1,153,371
Agriculture/Mining	12.8%	7.4%	2.3%	7.2%	0.2%	1.0%
Construction	7.8%	7.6%	15.6%	13.5%	10.1%	9.7%
Manufacturing	1.4%	3.5%	3.0%	3.3%	2.9%	3.8%
Wholesale Trade	0.4%	1.1%	1.1%	1.2%	2.1%	2.4%
Retail Trade	7.8%	7.6%	10.1%	9.1%	9.9%	10.1%
Transportation/Utilities	7.7%	4.7%	4.8%	4.4%	4.0%	4.1%
Information	0.7%	0.4%	2.6%	2.1%	1.9%	1.8%
Finance/Insurance/Real Estate	2.8%	2.1%	7.6%	6.2%	7.4%	7.1%
Services	52.4%	58.7%	44.8%	44.7%	57.7%	55.4%
Public Administration	6.1%	7.0%	8.1%	8.3%	3.8%	4.6%

Source: ESRI 2010

Table 3-27 2009 Employed Population 16+ Years of Age by Occupation for Communities and Counties in the ROI

	Amargosa Valley	Beatty	Pahrump	Nye County	Clark County	Nevada
Total Employment	905	569	10,846	15,417	823,682	1,153,371
White Collar	**46.4%**	**45.2%**	**49.5%**	**47.2%**	**52.8%**	**53.9%**
Management/ Business/ Financial	8.3%	4.4%	8.5%	8.0%	11.9%	12.2%
Professional	20.0%	19.5%	15.4%	16.4%	15.1%	16.1%
Sales	8.2%	8.8%	13.3%	11.1%	13.0%	12.7%
Administrative Support	9.9%	12.5%	12.2%	11.7%	12.8%	12.9%
Services	**25.0%**	**35.3%**	**22.9%**	**22.8%**	**28.0%**	**26.0%**
Blue Collar	**28.6%**	**19.5%**	**27.6%**	**30.1%**	**19.2%**	**20.1%**
Farming/Forestry/ Fishing	0.9%	0.2%	0.6%	0.5%	0.1%	0.2%
Construction/ Extraction	14.8%	8.3%	12.7%	13.0%	8.0%	7.9%
Installation/ Maintenance/ Repair	4.8%	5.6%	5.3%	6.3%	3.3%	3.6%
Production	3.2%	1.2%	3.0%	3.4%	2.6%	3.1%
Transportation/ Material Moving	5.0%	4.2%	6.1%	6.9%	5.2%	5.3%

Source: ESRI 2010

Local government workers are employed by Nye County. State government workers in Nye County are employed at the Nevada Division of Parks and the NDOT, among others. Federal agencies operating in or near Nye County include the DOE, U.S. DOD, USFWS, and the BLM.

Many sub-sectors of the service economy in Nye County are proportionately small when compared with the service sub-sectors in the State of Nevada and Clark County; particularly accommodation and food services, real estate, professional and technical, and health care services. In contrast, employment numbers in the retail trade sectors and the arts, entertainment, and recreation services sub-sector indicate that tourism and recreation play a key role in the Nye County economy.

According to an economic development strategy analysis prepared by the University of Nevada, Reno, rural counties often lose population in age groups 20 to 34 years because the young people with the best education, health, and the most marketable skills and abilities leave the rural areas

to realize their potential in areas with greater economic opportunities (UNR 2005). In addition to the out-migration of young persons, increased rates of retiree in-migration in recent years has raised concerns that the growing elderly population would require greater levels of public services in a narrowing economy characterized by a shrinking revenue base.

Employers in the Amargosa Valley are dispersed throughout the valley from US 95 south to the Nevada/California state line. Table 3-28 lists the major employers in the area and the number of employees. It is unknown how many of these employees reside in the Amargosa Valley and how many commute from Pahrump or Las Vegas. Most of the other employers in the area employ fewer than 10 people.

Table 3-28 Major Employers in Amargosa Valley

Company	Number of Employees
Ponderosa Dairy	120
Horizon Academy	50
IMV	30
US Ecology	30
Amargosa Valley School	29
Longstreet Inn and Casino	17
Cind-R-Lite	17

Source: Amargosa Valley School 2009; Bagley 2009; Bowlin 2009; EDEN 2009; NBMG 2008; Powell 2009

3.9.3.1 Income

In 2007, total personal income for Nye County was $1.35 billion and for Clark County was $71.6 billion. The total personal income for Nevada was $101.8 billion (U.S. Department of Commerce 2009). In 2000 the median household income for communities and counties in the ROI ranged from a low of $34,913 in Pahrump to a high of $44,650 in Clark County. However by 2010, Amargosa Valley had the lowest projected median household income of $41,852 and Clark continued with the highest at $57,807 (Table 3-29). Between 2010 and 2015 it is projected that median household income will grow between 2.85% and 3.28% in the ROI (ESRI 2010). In 2000, average household income is very similar between counties and communities in the ROI with the exception of Clark County at $57,569 (Table 3-30). Between 2010 and 2015, average household income is projected to grow at an average annual rate between 2.4 percent and 3.1 percent in most ROI counties and communities. However, Amargosa Valley is projected to increase average household income annually +6.19 percent between 2010 and 2015 (Table 3-31). This projection is more than likely taking into account the real potential for the areas alternative energy development that provides above average wages. As expected, per capita incomes are projected to increase at similar growth rates as average household incomes in counties and communities in the ROI (Table 3-29).

One potential source of income in the ROI is personal current transfer receipts. Personal current transfer receipts include government payments to individuals for retirement and disability insurance benefits, medical payments (mainly Medicare and Medicaid), income maintenance benefits, and veteran's benefits. In Nye County, personal current transfer receipts accounted for 22.7 percent of total personal income compared to 10.6 percent in Clark County and 10.7 percent in the State of Nevada or Clark County, which is an indicator of a larger proportion of retirement age population in Nye County (U.S. Department of Commerce 2009).

Table 3-29 Median Household Income for Communities and Counties in the ROI (2010 Dollars)

	2000 Census	2010 ESRI Projection	2015 ESRI Projection	2010-2015 Annual Growth Rates
Towns				
Amargosa Valley	$35,672	$41,852	$48,053	+2.96%
Beatty	$41,204	$50,582	$58,869	+3.28%
Pahrump	$34,913	$44,699	$51,633	+3.10%
Counties				
Nye County	$36,034	$45,624	$52,279	+2.92%
Clark County	$44,650	$57,807	$66,515	+2.85%
Nevada	$44,614	$57,546	$65,787	+2.86%

Source: U.S. Bureau of the Census, 2000 Census of Population and Housing. ESRI forecasts for 2010 and 2015.

Table 3-30 Average Household Income for Communities and Counties in the ROI (2010 Dollars)

	2000 Census	2010 ESRI Projection	2015 ESRI Projection	2010-2015 Annual Growth Rates
Towns				
Amargosa Valley	$47,099	$56,134	$73,515	+6.19%
Beatty	$42,910	$55,834	$62,543	+2.40%
Pahrump	$42,432	$53,623	$60,679	+2.63%
Counties				
Nye County	$43,196	$54,155	$62,062	+2.92%
Clark County	$57,569	$71,748	$82,836	+3.09%
Nevada	$57,469	$71,330	$82,236	+3.06%

Source: U.S. Bureau of the Census, 2000 Census of Population and Housing. ESRI forecasts for 2010 and 2015.

Table 3-31 Per Capita Income for Communities and Counties in the ROI (2010 Dollars)

	2000 Census	2010 ESRI Projection	2015 ESRI Projection	2010-2015 Annual Growth Rates
Towns				
Amargosa Valley	$19,219	$21,936	$28,843	+6.30%
Beatty	$16,844	$25,828	$29,062	+2.50%
Pahrump	$17,747	$22,317	$25,410	2.77%
Counties				
Nye County	$17,962	$22,513	$25,953	3.06%
Clark County	$21,785	$26,761	$30,784	3.01%
Nevada	$21,898	$26,969	$30,985	2.98%

Source: U.S. Bureau of the Census, 2000 Census of Population and Housing. ESRI forecasts for 2010 and 2015.

3.9.4 Public Services and Utilities

3.9.4.1 Law Enforcement and Emergency Services

Law enforcement in the Amargosa Valley is provided by the Nye County Sheriff's Department and the Nevada Highway Patrol. The Sheriff's Department has one substation in Amargosa Valley and three full time deputies. The area is also supported by a substation in Beatty which has one Lieutenant and three deputies. The Nevada Highway Patrol has three officers that patrol the highways in the area with a substation located in Pahrump (Amargosa Valley Area Plan Committee 2009).

Emergency services within Amargosa Valley are provided mainly by the Amargosa Valley Volunteer Fire Department managed by the Town of Amargosa Valley. There are two fire halls located in the area. The Nye County Emergency Services Department provides assistance to the local volunteers, including training. The BLM is responsible for fire protection for wildland fires on public land. Mercy Air Flight for Life helicopters provides emergency airlift services between Amargosa Valley and hospitals in Las Vegas. The Amargosa Valley Medical Clinic provides routine family medical care and is staffed by a visiting physician and physician's assistant (Amargosa Valley Area Plan Committee 2009).

3.9.4.2 Electricity and Natural Gas

The Project area is served by VEA. VEA is a nonprofit cooperative electric utility based in Pahrump, Nevada. VEA's service territory cover more than 6,800 square miles, mainly along the California-Nevada border. At present VEA provides electricity to approximately 16,000 customers (VEA 2009).

There are no natural gas services in the Amargosa Valley. However, there are several propane suppliers in Pahrump including: AmeriGas Propane, Proflame Gas of Pahrump, Shoshone Propane, and Suburban Propane.

3.9.4.3 Public Water Supply and Wastewater

There are very few public water supply systems in the Amargosa Valley Planning Area. The majority of water users rely on individual wells. There are only three public water supply systems near the Project area. These include wells supplying the Amargosa Elementary School, Amargosa Town Complex, and the Amargosa Water Company. As of 2008, over 500 domestic wells were listed in the NDWR database as being drilled in the Amargosa Valley Hydrographic Basin.

There are no wastewater treatment plants in the Amargosa Valley Planning Area. Domestic wastewater is disposed through septic tanks and leach fields.

3.9.4.4 Solid Waste

The NDEP, Bureau of Waste Management oversees the permitting of solid waste landfills and other waste management facilities within the state of Nevada. The nearest Class I landfill is the Pahrump Valley Landfill located north of Pahrump, east of Highway 160.

3.9.4.5 Schools

The proposed Project is located within the Nye County School District of Nye County. There are four schools that serve the Amargosa Valley; three public and one private. Horizon Academy is a special learning center for which students from other schools must apply independently. A summary of school information and enrollment for the schools is provided in Table 3-32.

Table 3-32 Summary of Schools in the Nye County School District

District	Schools	Grades Provided	Number of Students for 2008-2009 School Year	Location of School
Nye	Beatty School	K-8	103	Beatty
	Amargosa School	K-8	194	Amargosa Valley
	Beatty High School	9-12	139	Beatty
Private	Horizon Academy	7-12	129	Amargosa Valley

Source: Nye County School District 2009; Nevada Department of Education 2009

3.9.5 Fiscal Resources

Clark County: There are 90 funds that Clark County uses for its operations. Table 3-33 shows the total revenues, by category, associated with the overall Clark County budget and the General Fund at the end of the 2007–2008 fiscal year. A blank cell with no financial information indicates that the revenue source did not contribute to the county fund. The significant revenue sources for these funds are intergovernmental resources (46 percent), property taxes (25 percent), and licenses and permits (10 percent).

Table 3-33 Clark County Revenues: 2007-2008

Revenue	Overall	General Fund
Property Taxes	791,005,569	331,089,911
Other Taxes	66,010,096	14,341,093
Licenses and Permits	316,607,676	219,886,318
Intergovernmental Resources	1,422,232,908	330,571,827
Charges for Services	166,789,048	60,653,236
Fines and Forfeits	26,708,031	24,644,256
Special Assessments	37,236,673	-
Miscellaneous	291,483,804	136,016,587
Total Revenues	**$3,118,073,805**	**$1,036,753,592**

Source: Clark County 2009

Table 3-34 shows the expenditures for the 2007–2008 fiscal year (July 1 through June 30). Public safety and public works comprise the largest expenditure items within Clark County.

Table 3-34 Clark County Expenditures for Fiscal Year 2007-2008

Expense	
General Government	224,829,526
Judicial	187,097,471
Public Safety	1,048,734,667
Public Works	576,499,730
Health, Welfare, and Sanitation	326,872,672
Culture and Recreation	82,728,864
Community Support	13,127,241

Table 3-34 Clark County Expenditures for Fiscal Year 2007-2008	
Expense	
Intergovernmental Expenditures	114,566,225
Debt Service:	
Principal	110,892,600
Interest	122,112,389
Interest Cost\Fiscal Charges	78,169,949
Total Expenditures	**2,885,631,334**
Difference Between Revenue (Table 3-33) and Expenditures (Table 3-34)	232,442,471
Source: Clark County 2009.	

Nye County: The Nye County Finance Department describes county governmental revenues and expenditures within 5 major funds and approximately 67 non-major funds. The General Fund is the primary operating fund for Nye County (Nye County 2009). Table 3-35 and Table 3-36 summarize the Nye County revenues and expenditures, respectively. Blank cells indicate that the relevant revenue source did not contribute to the county fund, or that the fund did not pay for the relevant expense in Fiscal Year 2007-2008.

Table 3-35 Nye County Revenues: 2007-2008

Revenue	General Fund	Education Endowment Fund	Special Project Fund	Endowment Capital Projects Fund	Repository Oversight Fund	Overall Total incl Non-major Funds
Taxes	14,944,493	-	-	-	-	**20,545,682**
Licenses	135,133	-	-	-	-	**1,956,669**
Intergovernmental	14,066,342	-	11,250,000	-	3,343,065	**38,713,071**
Charges for Services	2,646,579	-	-	-	-	**4,690,031**
Fines and Forfeits	403,155	-	-	-	-	**678,477**
Other	1,445,393	612,796	1,068,554	719,162	-	**7,759,128**
Total Revenues*	**33,691,095**	**612,796**	**12,318,554**	**719,162**	**3,343,065**	**74,343,058**

* Information taken directly from Nye County 2009; inconsistencies have been noted.

Table 3-36 Nye County Expenditures for Fiscal Year 2007-2008

Expenditure	General Fund	Education Endowment Fund	Special Project Fund	Endowment Capital Projects Fund	Repository Oversight Fund	Overall Total incl Nonmajor Funds
General Government	12,342,734	-	540,064	-	3,343,065	**20,853,997**
Judicial	6,152,895	-	-	-	-	**6,464,099**
Public Safety	15,614,299	-	20,317	-	-	**19,225,464**
Public Works	114,738	-	355,310	-	-	**9,146,041**
Health and Sanitation	250,306	-	-	-	-	**1,133,407**
Welfare	-	-	-	-	-	**1,616,136**
Culture and Recreation	-	-	35,586	-	-	**413,651**
Community Support	392,940	-	476	-	-	**890,075**
Intergovernmental	298,900	1,119,264	841,088	-	-	**3,526,569**
Capital Projects	-	-	4,208,966	-	-	**5,863,564**
Debt Service:						
Principal	-	-	-	-	-	**2,183,241**
Interest	-	-	-	-	-	**436,848**
Total Expenditures	**35,166,812**	**1,119,264**	**6,001,807**	-	**3,343,065**	**71,753,092**
Difference Between Revenue (Table 3-35) and Expenditures (Table 3-36)	(1,475,717)	(506,468)	6,316,747	719,162	0	**2,589,966**

Source: Nye County 2009

3.10 ENVIRONMENTAL JUSTICE

On February 11, 1997, EO 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) was signed. This EO requires all federal agencies to assess whether their programs, policies, and activities have disproportionately high and adverse human health or environmental effects on minority and low-income populations in the United States.

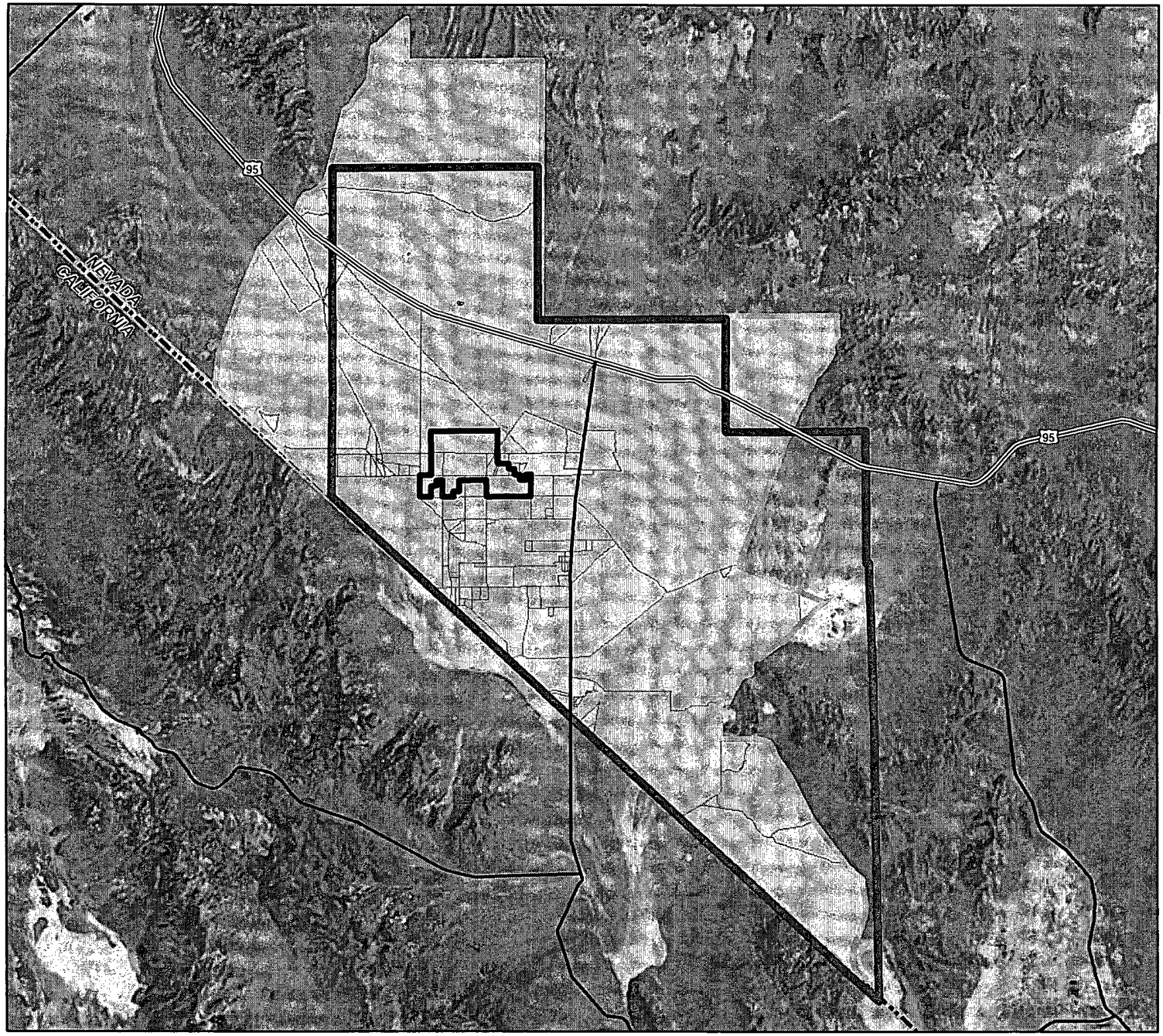
The EPA defines a community with potential Environmental Justice (EJ) populations as one that has a greater percentage of minority or low-income populations than does an identified reference community. Minority populations are those populations having (1) 50 percent minority population in the affected area or (2) a significantly greater minority population than the

reference area (EPA 1998). The EPA has not specified what percentage of the population can be characterized as "significant" in order to define EJ populations. Low-income populations were defined as those individuals that are considered living below poverty levels. The U.S. Census Bureau defines poverty level thresholds for individuals and a family of four as income levels below $8,501 and $17,029, respectively.

The U.S. Census Bureau has no specific designation for the Town of Amargosa Valley. Therefore, the EJ analysis is undertaken at the U.S. Census Block Group level, which allows an assessment of both poverty and minority populations. Within 5 miles of the Project area, there are two Block Groups which extend much farther than the 5-mile radius of the Project area; one in Nevada and one in California (Figure 3-14). The Block Group in California has no population within 5 miles of the Project area and thus was not used in the analysis. The Nevada Block Group encompasses 528 square miles and had a 2000 population of 1,176.

The reference areas are Nye County and the State of Nevada, which are larger geographic areas with which to compare the Census Block Group. Relevant ethnicity data and poverty level for the Census Block Group was used to determine whether populations residing within the affected area constitute a potential EJ population. This was done by comparing minority and poverty level statistics for the Block Group with those reported for Nye County and the State of Nevada. The data used for comparison was from the 2000 Census.

A potential EJ population is determined to exist in a Census Block Group if the minority population (e.g., a non-white population) is more than 10 percentage points higher than the minority population within one of the reference communities (Nye County or the State of Nevada). Table 3-37 summarizes these racial proportions for the referenced groups. As shown in Table 3-26, the minority population in the Amargosa Valley Block Group is 20.7 percentage points higher than that in Nye County and 1.2 percentage points higher than that in Nevada. The majority of the minority population in the Block Group is classified as Hispanic. The percentage of the population below poverty level in the Block Group is 4.1 and 4.3 percentage points higher than that in Nye County and Nevada, respectively.



Amargosa Farm Road Solar Energy Project (NVN-84359)

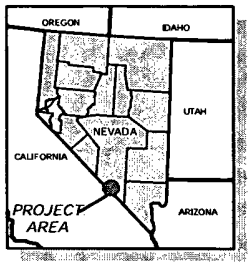
Environmental Justice Figure 3-14

LEGEND

- Project Area
- Amargosa Valley Town Boundary
- Census Block Group
- Census Block (Population > 0)
- Census Block (Population = 0)

General Reference Features

- US Highway
- State Highway
- State Boundary



Source: Census Data - Tiger 2009, ESRI, 2005;
AV Town Boundary - TerraSpectra Geomatics, 2009;
Highways, Imagery - ESRI, 2005, 2009

September 2010

0 3 6 Miles

Table 3-37 Racial Proportions Summary			
	Nevada	**Nye County**	**Block Group**
Total Population	1,998,257	32,485	1,181
White	1,303,001	27,511	753
Hispanic	393,970	2,713	360
African American	131,509	373	1
American Indian	21,397	587	58
Asian	88,593	242	8
Pacific Islander	7,769	100	1
Other	2,787	68	NA
Mixed	49,231	891	NA
Percentage Minority	34.8	15.3	36.0
Percentage Below Poverty Level	10.5	10.7	14.8
Source: U.S. Census Bureau 2009a			

3.11 LAND USE, RECREATION, TRANSPORTATION AND ACCESS

This section of the EIS characterizes the existing and future land use, recreation, access, and transportation conditions within the ROI. The ROI area varies by resource area. The ROI for land use includes the Town of Amargosa Valley planning area, located in the south-central part of Nevada in Nye County, and covers approximately 505 square miles of rural, unincorporated desert land. The ROI for the transportation and access information encompasses a broader area, including Nye and Clark counties in Nevada, with an emphasis on the communities closest to the Project area, including Amargosa Valley and Beatty, as well as larger communities within 2 hours of the Project area, such as Las Vegas and Pahrump. For recreation resources, the ROI encompasses a radius of approximately 50 miles around the Project area, based on the visual resources ROI, which accounts for all areas within the viewshed of the Project area.

3.11.1 Regulatory Framework

The BLM may grant a right-of-way for use of the land it administers under the FLPMA, 43 USC §§ 1701-1782, specifically § 1732 and § 1761 et seq. Under FLPMA, the Secretary of the Interior is authorized to grant, issue, or renew rights-of-way over, upon, or through such land for utility corridors, roads, trails, highways, railroads, canals, etc. The FLPMA provides the BLM with authority to issue rights-of-way for the use, occupancy, and development of public land. The regulations establishing procedures for the processing of these rights-of-way are found in 43 CFR Part 2800.

FLPMA requires that BLM manage the lands it administers under the principle of "multiple use and sustained yield." 43 USC §§ 1701, 1702, 1732, FLPMA defines "multiple use" to mean:

> "... management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources...; the use of some land for less than all of the resources a combination of balanced and diverse resource uses that takes into accounrt the long-term needs of future generations for renewable and nonrenewable resources including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic scientific and historical values..." 43 USC § 1702(c).

This mandate does not require that every use be allowed on every acre, but rather that a proper balance of uses be struck in BLM's RMPs and other land use decisions. In exercising this discretion, the BLM has defined the appropriate range of, and balance between, the multiple uses of land it administers in the Las Vegas RMP/Final EIS.

BLM Las Vegas RMP and Final EIS (1998) – This land use plan identifies existing and future management direction in the form of objectives and management for 3.3 million acres of public land in Clark and Nye counties, located in southern Nevada. All public land within the planning area, unless otherwise classified as ACEC or Wilderness Study Areas, is available for rights-of-way under FLPMA. Land use permit applications are addressed on a case-by-case basis, where consistent with other resource management objectives and local land uses.

Nye County Comprehensive Plan (Nye County Board of Commissioners 1994) – This plan was developed to protect the health, welfare, and economic well being of the County by creating management objectives for the effects of population growth and decline, and to serve as a framework for local land use plans. It is Nye County's objective to establish long-term partnerships with the renewable energy sector, and has goals to:

- support and encourage the efficient use of energy
- promote the siting of renewable energy research or pilot technology and demonstration projects in Amargosa Valley
- become proactively involved in the federal and state efforts to route and approve renewable energy transmission corridors for distributing power from the Amargosa Valley to the national grid

Amargosa Valley Area Plan (Amargosa Valley Area Plan Committee 2009) – This plan was developed to manage the community's natural resources and provide public services and facilities while protecting the public health, safety, and welfare.

3.11.2 Data Collection and Methods

Existing land use and recreation data were collected through analysis of aerial photography, field verification, review of existing studies and plans, and coordination with local and county

agencies. Individuals from the BLM were contacted and the BLM Legacy Rehost (LR2000) database was utilized to verify recreation and land use resources on BLM land within the ROI.

Planned land use and recreation information was collected through review of existing plans for the Amargosa Valley and the BLM. Local, county, and federal agencies were contacted to identify potential or approved developments near the proposed Project.

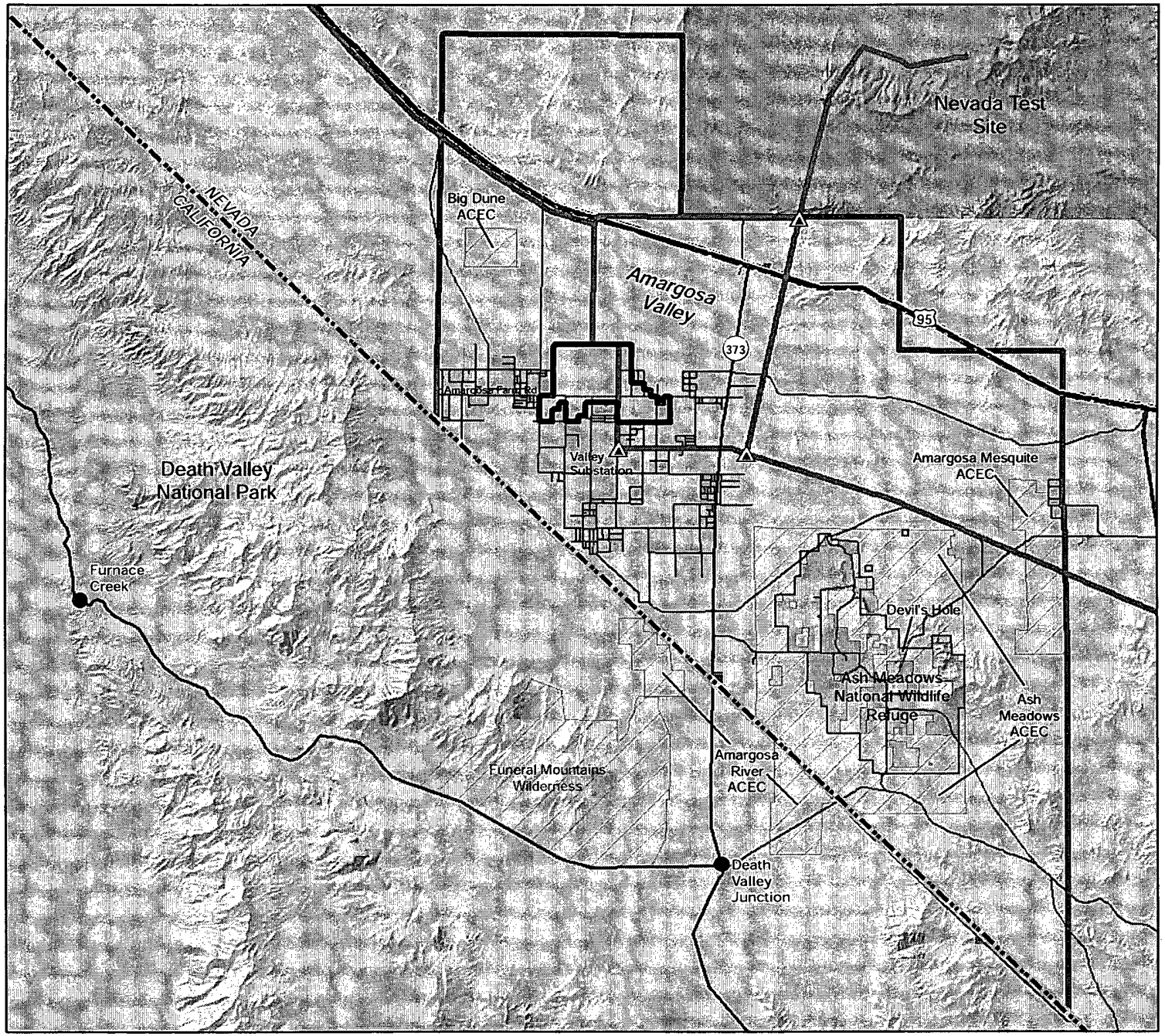
Land jurisdiction does not necessarily imply land ownership; however, in some cases the authority that has jurisdiction may also own the land. Three categories of land ownership were identified and mapped within the land use ROI: federal, local, and private. This information was obtained from available maps, planning documents, and discussions with agencies (Figure 3-15).

3.11.3 Existing Land Use

Existing land use conditions within the ROI are characterized primarily by open desert, utility corridors and facilities, limited industrial (mining and dairy) and commercial development, agriculture, and scattered low-density residences (Figure 3-16).

As described in Section 3.9 – Socioeconomic Resources, approximately 97 percent of Nye County's land area is administered by the federal government.

The BLM is the largest landowner in the ROI. The Southern Nevada District, Pahrump Field Office manages 3.3 million acres of public land in southern Nevada and 700,000 acres in southern Nye County, including the land requested under the Proponent's right-of-way application for the proposed Project. Per the 1998 Las Vegas RMP/EIS, these lands are available for multiple uses, including opportunities for recreation, utility development, mining, wildlife habitat, grazing, and wilderness preservation. The proposed Project conforms to the intent of the 1998 Las Vegas RMP/EIS (BLM 1998).



Amargosa Farm Road Solar Energy Project (NVN-84359)

Jurisdiction
Figure 3-15

LEGEND

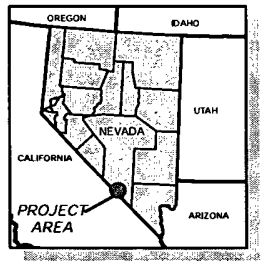
- Project Area
- Amargosa Valley Town Boundary

Surface Management

- Bureau of Land Management
- Department of Energy
- National Park Service
- US Fish and Wildlife Service
- Private

General Reference Features

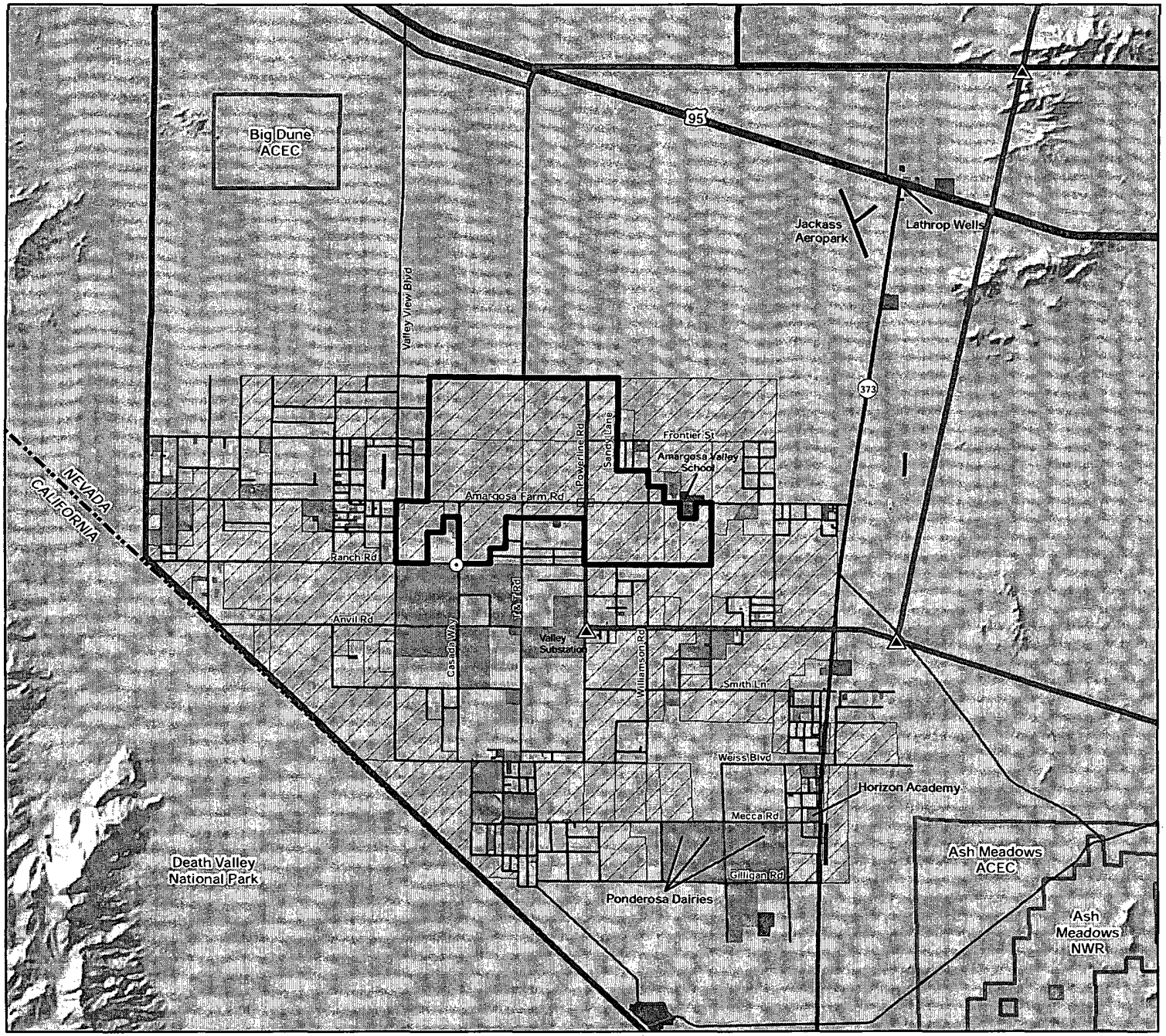
- Existing Transmission Line (<230kV)
- Existing Substation
- Special Management Area
- State Boundary
- US Highway
- State Highway
- Local Road



Source: Land Ownership, SMA - BLM, 2007; Ash Meadows - USFWS, 2005; Local Roads, AV Boundary - TerraSpectra Geomatics, 2009; Transmission Lines, Substations - Platts, 2009; Highways - ESRI, 2009

September 2010

0 3 6 Miles



Amargosa Farm Road Solar Energy Project (NVN-84359)

Existing Land Use Figure 3-16

LEGEND

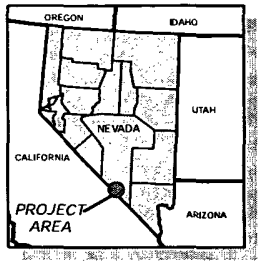
- Project Area
- Amargosa Valley Town Boundary

Current Land Use

- Residential
- Agriculture
- Commercial
- Industrial
- Mining
- Public/Quasi-Public
- Special Development Area

General Reference Features

- Existing Transmission Line (<230kV)
- Existing Substation
- Proposed Project Well
- BLM Land Designated for Disposal
- Special Management Area
- Highway
- Local Road
- Airstrip
- State Boundary



Source: Transmission Lines, Substations - Platts, 2009; BLM Disposal Land - BLM, 2009; AV boundary, Airstrips, Land Use, Local Roads - TerraSpectra Geomatics 2009; Wells - Nevada State Engineer, 2008; Highways - ESRI, 2009

September 2010

0 1 2 Miles

Varieties of leases, easements, and rights-of-way have been granted by the BLM on land they manage within the ROI. Table 3-38 lists those that have been authorized or are pending within a 2-mile buffer around the Project area.

Table 3-38 Authorized and Pending Rights-of-Way Granted

Serial Number	Status	Description
NVN 52385	Authorized	Amargosa Community Pit – Sand and Gravel Facility
NVN 62888	Authorized	Right-of-way – FLPMA, Non-Energy Facilities
NVN 78483	Authorized	Free Use Permit – Government – Sand and Gravel Facility
NVN 83205	Authorized	Sand and Gravel Facility
NVN 83276	Pending	Mine/Reclamation Plan, Sand and Gravel Facility
NVN 84623	Authorized	Sand and Gravel Facility
NVN 85746	Pending	Desert Research Institute Wind Measurement Sites, Right-of-Way – Power Transmission – FLPMA Wind Energy Facilities
NVN 87822	Pending	Sand and Gravel Facility
NVN 35976	Authorized	Sale – Section 209, FLPMA
NVN 48876	Authorized	Access Road (2,640' x 40') Right-of-Way – Road, Non-Energy Facilities
NVN 53354	Authorized	Amargosa Valley Road, Right-of-Way – Road, Non-Energy Facilities
NVN 61968FD	Pending	Segregation Outside Las Vegas Valley, BLM Section 206, FLPMA
NVN 73706	Authorized	Nevada Bell, Right-of-Way
NVN 85654	Pending	Cogentrix Solar Transmission Line Right-of-Way Application; overlapping existing right-of-way (NVN-84359)
NVN 66289	Authorized	Ely to Cherry Creek Right-of-Way; Fiber Optic Facilities
NVN 84466	Pending	Pacific Solar Investments, 300 MW solar trough site called Amargosa South
NVN 85657	Pending	Cogentrix Solar Services, Solar thermal Energy Facility Amargosa Valley Big Dune overlapping existing right-of-way (NVN 84466)
NVN 83150	Pending	Cogentrix Solar Services Right-of-Way Application; 1,400 MW Concentrating Solar Trough Project

Source: BLM 2009b

The 1998 Las Vegas RMP/EIS identified 28,257 acres of land in the ROI available for disposal, which means these lands are available for sale, exchange, or recreation and public expansion and development (BLM 1998). Currently, there are approximately 27,904 acres of disposal land

within the ROI. All BLM-managed land requested under the Proponent's right-of-way application is land that has been designated for disposal.

There is no state-owned land within the ROI. The nearest state-owned land is the Belmont Courthouse State Historic Park in northern Nye County, approximately 170 miles away. Within the ROI, a few state-owned facilities are present, including an NDOT-managed rest area at the intersection of US 95 and NV 373. Private land within the ROI includes isolated pockets of residential and commercial development within the Amargosa Valley.

There are no incorporated cities or towns within the ROI or Nye County. The Project area is located in the unincorporated Town of Amargosa Valley, which consists of a rural population of roughly 1,500 people, spread over a large geographic area of approximately 505 square miles. While the BLM has exclusive jurisdiction over land use activities on land that it manages, the Amargosa Valley Area Planning Commission provides guidance to ensure that proposed projects within the Town Planning boundary are constructed and operated in a manner that is consistent with the standards set forth in the Amargosa Valley Area Plan (Amargosa Valley Area Plan Committee 2009).

3.11.3.1 Residential

Residential development in the ROI includes isolated homesteads scattered throughout the Amargosa Valley. According to the Nye County Assessors database, there are approximately 600 parcels of residentially zoned private properties within 2 miles of the Project area, generally to the south and east. Concentrated population areas near the Project site include an area east of Sandy Lane, approximately 0.25 mile east of the Project area; and an area west of Valley View Boulevard along Amargosa Farm Road.

3.11.3.2 Commercial and Quasi-Public

There is limited commercial development within the Amargosa Valley. The closest commercial development is located approximately 6 miles northeast of the Project area at the intersection of NV 373 and US 95. It includes a business park, the Nevada Joe's commercial complex (containing a restaurant, brothel, and convenience store), a fireworks retailer, gas station, helicopter pad, and a materials-laydown yard leased by the Nye County Nuclear Waste Repository Project Office.

The Amargosa Valley Community Complex mixed-use area is located adjacent to Amargosa Farm Road immediately southeast of the Project area. It includes public facilities: an emergency services center (fire department, ambulance service, helipad, and sheriff's substation), library, medical clinic, senior center, park, cemetery, rodeo grounds, AVIA Community Center and Raceway, and the Amargosa Valley School.

A mixed-use commercial area is located adjacent to NV 373 and Mecca Road, approximately 3 miles southeast of the Project area. The area includes the Horizon School complex (boarding school with associated residences), a grocery store, First International Bank, and pizza restaurant.

Two commercial institutions, the Longstreet Hotel and Casino and the State Line Saloon complex (contains a restaurant, RV park, golf course, convenience store, and lounge with gambling) are located 8 miles southeast of the Project area on the Nevada/California border, east and west of NV 373.

Two churches are located in the ROI: the Church of Amargosa located on Amargosa Farm Road and an unknown church located off Maverick Road. Both are located approximately 0.5 mile west of the Project area.

3.11.3.3 Industrial and Agricultural

There is limited industrial development in the ROI. The Ponderosa Dairy, a large dairy operation employing approximately 120 employees, is located roughly 2 miles south of the Project area.

Within the Amargosa Valley, the principal crop grown is alfalfa, which supports the local dairy operations. Other crops include fruits and vegetables, and nut trees (primarily pistachios).

3.11.3.4 Communication Facilities

Three cellular towers are located within the Amargosa Valley Community Complex: one adjacent to the senior center and two located at the emergency services building. There are three Internet provider towers in the local area. The towers are located adjacent to the dairy, adjacent to the health clinic complex, and southwest of the Project area on T&T Road (per personal communication with Jan Cameron, December 16, 2009).

3.11.3.5 Air Facilities

Three private airstrips are located within the Amargosa Valley. One at the Mecca Road alignment and NV 373; one on the east side of NV 373 at the Amargosa Farm Road alignment, and off of Valley View Boulevard; and one the north side of Amargosa Farm Road. The nearest major airport to the Project area is McCarran International Airport, located approximately 3 hours east, in Las Vegas, Nevada.

An abandoned airstrip, formerly Jackass Aeropark, is located approximately 5 miles northeast of the Project area, west of the intersection of US 95 and NV 373.

3.11.3.6 Utilities

The Project area is located approximately 2 miles north of the VEA-owned Valley Substation. A 138kV transmission line, owned and operated by VEA, traverses north paralleling Powerline Road to US 95. Two other VEA transmission lines are located on the eastern edge of the Project area. Additionally, a telephone/telegraph right-of-way owned by Nevada Bell is adjacent to the western edge of the Project area. The right-of-way runs north from Anvil Road to US 95, and continues in the ROI east on Anvil Road and north on NV 373.

3.11.3.7 Mining/Extraction

There are no active mining claims within the Project area (LR2000). There are three active mineral-resource-extraction areas approximately 5 miles from the Project area. Two of these areas are industrial mineral mines with processing plants for cinder and specialty clay products. The location of these mining areas is shown on Figure 3-4.

IMV Nevada mines and processes a variety of specialty clays, approximately 5 miles south of the Project area, south of Anvil Road near School Lane. Currently, IMV maintains mining claims (the Mud Camp Mining claims in Sections 20, 21, and 29 of T16S R50E) on approximately 10,000 acres in the Amargosa Valley near the Nevada/California border. An exploration plan is maintained and extensive ore reserves are identified for future production. From the mine locations, specialty clays are processed at the plant in Section 29 of T17S R49E. A number of products are made using the clays for a wide variety of uses in industrial, construction, and agricultural applications.

Cinder Cone Mine, owned and operated by Cind-R-Lite Block, holds a series of public and private claims for volcanic-mineral materials, such as pumice and cinder. These claims are located in Section 36 of T14S, R48E, 9 miles north of the Project area and north of US 95.

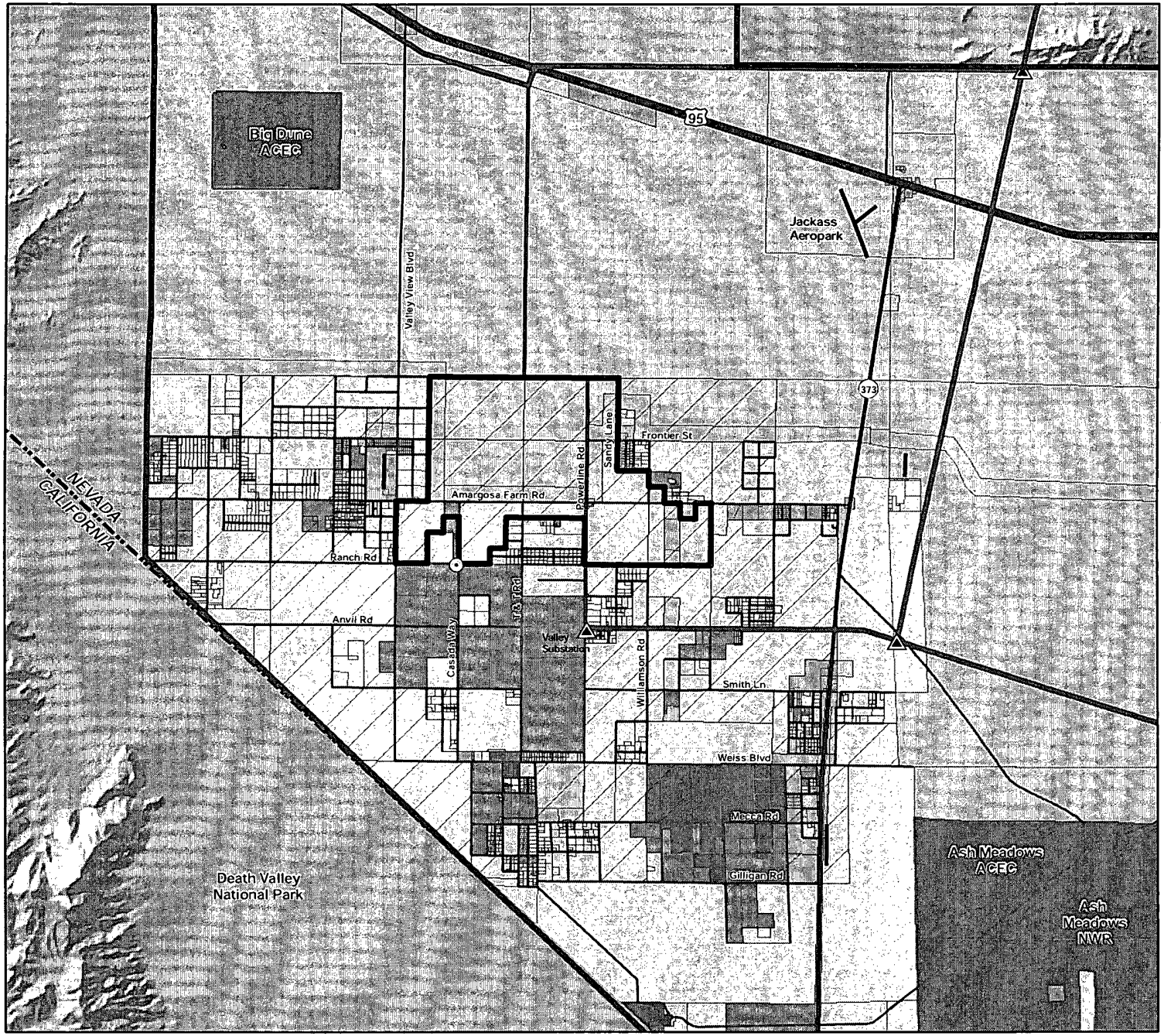
The third area contains claims filed by the Nye County Road Department, which operates a sand and gravel pit that occupies Section 10 of T15S R49E.

3.11.4 Planned Land Use

Planned or future land use refers to the future land uses designated within the ROI federal (BLM) and local (Amargosa Valley Area Plan) jurisdictional entities' plans. These land management plans reflect the goals and policies that guide the physical land development. Under the guidance of the 1998 Las Vegas RMP/EIS, a total of 27,904 acres of established land disposal areas on BLM land in the ROI and surrounding vicinity are currently available for transfer through sale or lease to other uses (BLM 1998). With the development of the proposed Project, approximately 7,000 fewer acres would be available for BLM disposal to other federal actions.

In the ROI, which is outside of the Pahrump Regional Planning District, the County does not provide official guidance for new developments. Based on relevant planning documents for the jurisdictions present in the ROI, the overall land uses, types, patterns, and densities therein are not expected to change substantially (Figure 3-17).

The Amargosa Valley Area Plan (Amargosa Valley Area Plan Committee 2009) limits parceling in the ROI to a minimum of 2 acres for the Low Density Residential land use designation; and to 5 acres for the Rural Density Residential land use designation outside specified higher density areas on the perimeter of the planning area boundary. It also shows a specification of a 0.25-mile Open Space, Parks & Trails land use designation between residential areas and the area where the proposed Project is located.



Amargosa Farm Road Solar Energy Project (NVN-84359)

Future Land Use Figure 3-17

LEGEND

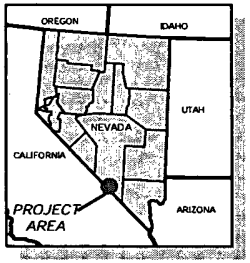
- Project Area
- Amargosa Valley Town Boundary

Future Land Use

- Residential
- Agriculture
- Industrial
- Community/Utility Facility
- Mixed Use
- Open Space, Park, Trail
- Community Development Reserve
- Special Development Area
- Special Development Area (Federal)

General Reference Features

- Existing Transmission Line (<230kV)
- Existing Substation
- Proposed Project Well
- BLM Land Designated for Disposal
- Special Management Area
- Highway
- Local Road
- Airstrip
- State Boundary



Source: Transmission Lines, Substations - Platts, 2009; BLM Disposal Land - BLM, 2009; AV boundary, Airstrips, Land Use, Local Roads - TerraSpectra Geomatics 2009; Wells - Nevada State Engineer, 2008; Highways - ESRI, 2009

September 2010

0 1 2 Miles

Future land uses shown for the ROI include Special Development Areas, rural density residential, open space, parks & trails, a school, proposed museum and technology park, landfills and utility facilities. The term "Special Development Area" is a mixed-use designation to set aside public or private areas where a variety of land uses might be proposed for approval, including projects under review by the BLM, such as Solar Energy Facilities (Amargosa Valley Area Plan Committee 2009). Nye County's resolution to adopt the plan:

> *"...is a guide toward future land use decisions over the next 20 years, without restricting private property rights or limiting the right to enter into any development agreements. The U.S. Bureau of Land Management would have to consider the plan when making decisions" (Jan Cameron, Pahrump Valley Times, November 2009).*

The Development Agreement made between Nye County and the Proponent "found that the [Development] Agreement is consistent with the County's plans, policies and regulations, including the Amargosa Valley Area Plan and the Master Plan, and that the execution of this Agreement on behalf of the County is in the public interest and is lawful in all respects."

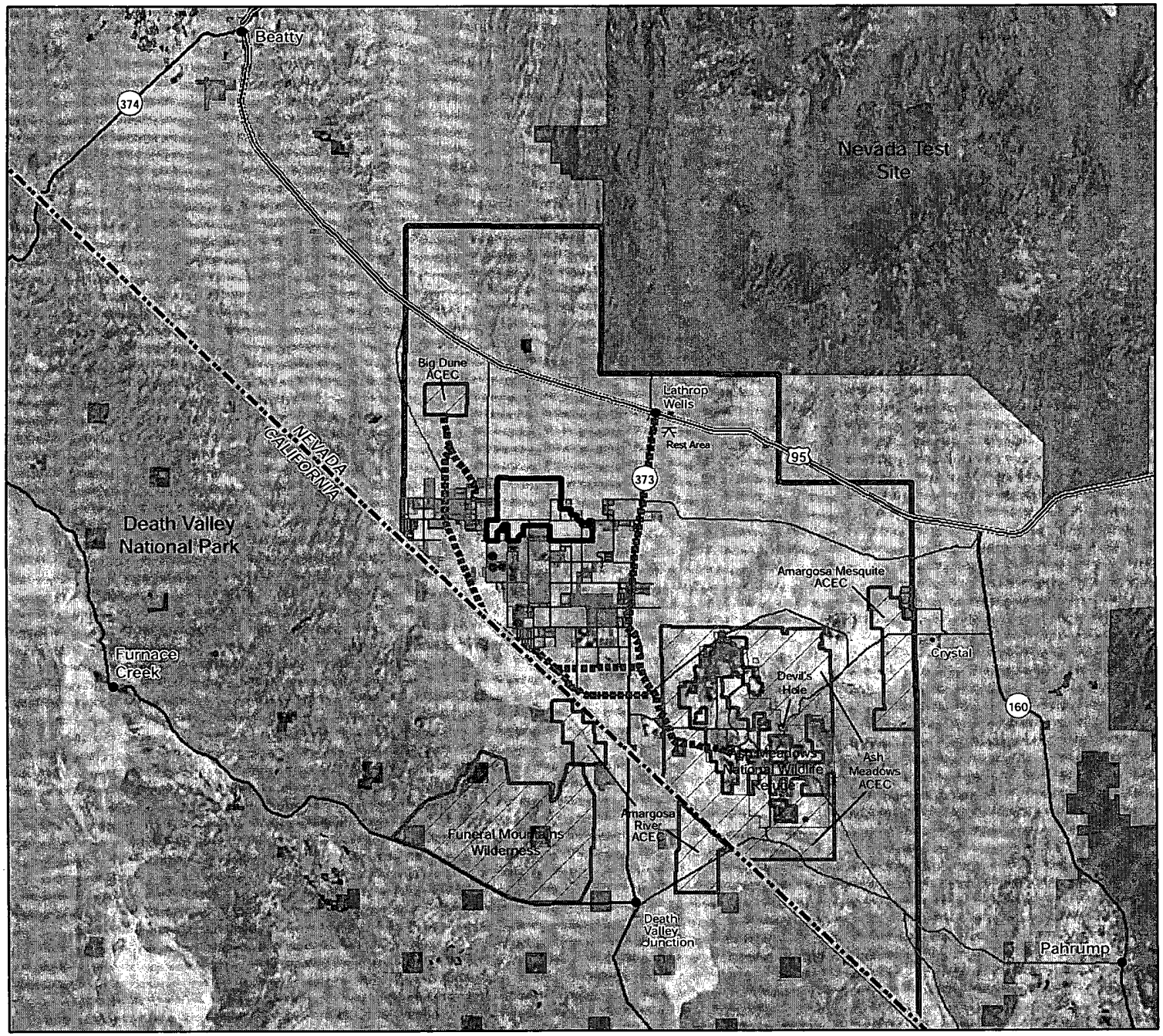
3.11.5 Recreation

For recreation resources, the ROI encompasses a radius of approximately 50 miles around the Project area. The 50-mile radius includes the mountains and valleys surrounding the Amargosa Valley, extending into the Death Valley National Park in California. The mountains and deserts surrounding the Project area offer a variety of dispersed recreation including OHV use in the Big Dune area and on existing roads and dry washes; big and small game hunting in the surrounding desert and mountains; and hiking, camping, and sightseeing in the Funeral Mountains and other accessible areas (Figure 3-18).

3.11.5.1 Special Management Areas

Big Dune, a unique sand dune area approximately 4 miles northwest of the Project area, is one of the more popular recreational areas in the ROI. The BLM manages this area primarily as an OHV recreation area, and as an ACEC for several sensitive beetle species. Other recreational opportunities include wildlife viewing, photography, and sandboarding and sandskiing on open dunes. The Big Dune recreational area is accessed primarily from Valley View Boulevard approximately 2 miles south of US 95. Developed facilities include a parking and vending area. Dispersed camping areas on the east and west sides of the dune is available as well. A Recreation Management Plan for the 1,920-acre area is being developed by the BLM.

The Ash Meadows NWR, managed by the USFWS, is located approximately 7 miles southeast of the Project area. Ash Meadows is a unit of the Desert Refuge Complex, which protects and manages valuable ecosystems in the Southwest. The Comprehensive Conservation Plan (2009) for the Desert NWR Complex provides guidance for the refuge and ensures public involvement in management decisions.



Amargosa Farm Road Solar Energy Project (NVN-84359)

Recreation and Transportation Figure 3-18

LEGEND

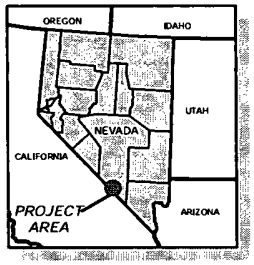
- Project Area
- Amargosa Valley Town Boundary

Surface Management

- Bureau of Land Management
- Department of Energy
- National Park Service
- US Fish and Wildlife Service
- Private

General Reference Features

- US Highway
- State Highway
- Local Road
- Rest Area
- Future Trail / Recreation Corridor
- Special Management Area
- State Boundary



Source: Land Ownership, SMA - BLM, 2007; Trails, Local Roads, AV Boundary - TerraSpectra Geomatics, 2009; Transmission Lines, Substations - Platts, 2009; Ash Meadows - USFWS, 2005; Highways - ESRI, 2009

September 2010

0 4 8 Miles

The Ash Meadows unit includes a variety of recreational opportunities and facilities and includes Devils Hole, a detached unit of the NPS Death Valley National Park, which is managed as a wildlife refuge to an endangered species of pupfish. Encompassing over 23,000 acres of spring-fed wetlands, it contains a rare desert wetland ecosystem that provides habitat for 25 endangered or threatened species found only at Ash Meadows. Recreation opportunities include: hunting, boating, hiking, wildlife observation, environmental education, and photography. Facilities include a visitor center, boat launch, and picnic area, all of which are accessible by NV 373.

The Ash Meadows ACEC's 37,152 acres surround the Ash Meadows NWR. The ACEC is located approximately 5 miles southeast of the Project area and is managed for special status species habitat.

The Amargosa Mesquite ACEC is located approximately 12 miles east of the Project area and is managed for the neotropical bird habitat within its 6,891 acres.

South of the Nevada/California border, the Amargosa River ACEC encompasses 21,552 acres in three distinct geographic units, and are located in northeastern San Bernardino and southeastern Inyo counties, California, near the communities of Tecopa and Death Valley Junction. Eighty-nine percent of the ACEC is on private land, but the BLM has no jurisdiction on private land. Only one of the three separate units in this ACEC is in close proximity to the Project area: the Upper Amargosa Mesquite Bosque Unit, approximately 8 miles south of the Project area, is located west of CA 127 and immediately north of the Funeral Mountains Wilderness. It contains 2,720 areas of public land administered by the BLM. This ACEC contains significant historic and cultural, biological and scenic values centered on the river for which it is named. The Upper unit is considered semi-primitive, with no developed campgrounds or facilities and limited motorized vehicle access. Recreation opportunities include sightseeing, bird and wildlife viewing, and photography. The most common activity is casual use vehicle touring. The Amargosa River ACEC Implementation Plan/Environmental Assessment (2006) serves as the guidance document for this ACEC.

Also in California, approximately 4 miles southwest of the Project site, is the eastern boundary of the Death Valley National Park. Death Valley National Park covers approximately 5,262 square miles, 95 percent of which is designated as wilderness. Death Valley National Park's recreational opportunities include backcountry road sightseeing, biking, hiking, camping, wildlife observation, and stargazing. There are no developed recreational facilities present for approximately 7 miles into Death Valley National Park from Lee's Camp Road. This road is a common approach for recreational users going into the park from the Amargosa Valley, and is a continuation of Amargosa Farm Road (personal communication with Jan Cameron, December 16, 2009). Echo Canyon Road, a road that requires a 4-wheel-drive vehicle and that the NPS maintains and recommends for a backcountry drive, continues south from Lee's Camp Road into the park.

On the southeastern end of Death Valley National Park in Inyo County, within the ROI at approximately 7 miles south of the Project site, is the Funeral Mountain Wilderness Area. The area encompasses 25,708 acres managed by the BLM Barstow Field Office, and comprises portions of the Funeral Mountains ranging in elevations from 2,200 to 7,000 feet. Recreation opportunities include dispersed hunting, non-commercial trapping, hiking, horseback riding, and

camping within the wilderness area and non-vehicular access to Death Valley National Park. The Funeral Mountain Wilderness is closed to vehicular traffic, but is open to non-vehicular recreational traffic.

3.11.5.2 Future Recreation

All public land not included within a special management area is managed as an Extensive Recreation Management Area. The objective of these lands is to manage them, emphasizing dispersed and diverse recreation activities (BLM 2008).

The Amargosa Valley Area Plan has designated Open Space, Parks, and Trail corridors parallel to NV 373 east of the Project site, north from Frontier Road to Mojave Road and along Mojave Road west of the Project site (Amargosa Valley Area Plan Committee 2009).

3.11.6 Transportation and Access

The ROI for transportation and access includes Nye and Clark counties in Nevada, with an emphasis on the communities of Amargosa, Beatty, Pahrump, and Las Vegas. US 95 is located approximately 5 miles north of the Project area. Running east and west through the Amargosa Valley, US 95 is the major regional transportation route between Las Vegas and Reno. It serves local travelers between Las Vegas and Beatty and is a major connector route from Las Vegas to points north and west. This principal arterial route is part of the National Highway System, but is maintained by NDOT. The Lathrop Wells Rest Area, maintained by NDOT, is located at the intersection of US 95 and NV 373.

NV 373 (CA 127 in California) is a major rural collector route that runs north and south approximately 3 miles east of the Project area. It is a major travel route to Death Valley National Park from US 95 and a local travel route for residents and travelers within the local community. NV 373 is also a primary travel route to Ash Meadows NWR. Within the ROI, NDOT operates automatic traffic recording data sites along US 95 and NV 373. The 5-year Annual Average Daily Traffic for these sites is listed in Table 3-39.

At the eastern extent of the ROI, NV 160 is a regional travel route approximately 18 miles east of the Project area. It is used by residents and travelers to Pahrump and the small community of Crystal, Nevada. NV 160 is also an alternate travel route for recreational visitors to Death Valley National Park and Humboldt-Toiyabe National Forest for eastbound travelers along US 95.

At the western extent of the ROI, NV 374 is a travel route primarily for recreation travelers between Beatty and Death Valley National Park.

Table 3-39 5-Year Annual Average Daily Traffic for the Amargosa Valley Area					
Station/Route/Location	**2003**	**2004**	**2005**	**2006**	**2007**
Station 0230019/US 95, Maine St., 1.5 mile south of NV 373/Death Valley Junction Road	2,800	3,200	2,850	2,900	2,800
Station 0230020/NV 373, Death Valley Junction Road, 0.5 mile south of US 95	570*	760	560	560*	560
Station 0230021/US 95, Maine St., 0.2 mile north of NV 373	2,500	2,500*	2,600	2,550	2,600
Station 0230078/Valley View Boulevard, 0.1 mile west of US 95	100	140	140	160	150
*Data adjusted or estimated					

Within the Amargosa Valley, local access routes provide direct access to local destinations such as commercial, agricultural, and residential areas. Primary transportation corridors (local two-lane roadways) in the ROI include:

- Amargosa Farm Road – An east-west connector road along the southern edge of the Project area. The Proponent is currently working with the Nye County Public Works Department to realign Amargosa Farm Road. The new alignment would be located 1,320 feet (0.25 mile) south of its current alignment to follow the southern perimeter of the solar fields.

- Valley View Boulevard – A north-south connector road that connects US 95 to the Amargosa Valley Community. The road is located along the western edge of the Project area. The road is used by residents and recreational users accessing the Big Dune area from the east.

- Powerline Road – A north-south connector road that connects the two main east-west connector roads within the Amargosa Valley. The northerly east-west connector road is the above described Amargosa Farm Road and the second is Mecca Road, which is 5 miles south of Amargosa Farm Road.

Other improved and unimproved local roads in the ROI include Sandy Lane, Frontier Road, Williamson Road, Atomic Road, Barnett Street, Senior Center Road, School Lane, Casada Way, and T&T Road. Numerous improved and unimproved roads follow the section lines and half section lines for access to dispersed agriculture and residential areas throughout the ROI.

3.11.6.1 Future Transportation

The Amargosa Valley Area Plan (Amargosa Valley Area Plan Committee 2009) identifies long-range plans for developing future roadway networks in the Amargosa Valley. The plan identified multiple extensions and improvements to secondary roads in the ROI, south of the Project area. The extensions would serve to connect the existing street grid south of the Project area, and north to create three additional connections to US 95. The plan also notes that a portion of the abandoned T&T railroad route has the potential to serve the proposed Yucca Mountain Nuclear Waste operation with rail access through a portion of the Amargosa Valley.

3.12 VISUAL RESOURCES

This section focuses on the inventory, identification, and description of existing visual resources that could be affected by the construction, operation, and maintenance of the proposed Project. Based on methods derived from the BLM VRM System (Manual H-8410-1) and consultation with Las Vegas Field Office VRM staff, the visual resource inventory for the Project focuses on scenic quality and landscape sensitivity (scenery), distance zones (sensitive viewers), and visual resource inventory and management classes.

3.12.1 Regional Setting

The proposed Project is located within the Mojave Desert section of the Basin and Range Province. The Basin and Range Province is distinguished by isolated, roughly parallel mountain ranges separated by closed desert basins (Fennemen 1931). Mountain ranges trend north to south with distinctive alluvial areas at their bases (known locally as *bajadas*). The Mojave Desert is characterized by dominant stands of low-growing creosote bush, burrobush, and saltbush, with varied occurrences of Joshua tree and yuccas.

The proposed Project is located in the Amargosa Valley, a basin loosely surrounded by the Yucca Mountains approximately 13 miles to the north, the Spring Mountains approximately 23 miles to the east, and the Funeral Mountains stretching approximately 12 miles from the south extending to within 8 miles to the west. The Amargosa Valley encompasses approximately 500 square miles. The valley generally drains to the south towards the Amargosa River and is traversed by several small washes. The topographic nature of the valley is generally flat with subtle elevation change.

There are approximately 80 residences and related community facilities within a 2-mile radius from the Project site. These populated areas contain denser vegetation that is not native to this portion of the Mojave Desert, including Cottonwoods and extensive amounts of Salt Cedar.

Modifications that have affected the landscape setting associated with the proposed Project include industrial/commercial and agricultural development associated with the Town of Amargosa Valley, industry related to farming (including center-pivot irrigated agricultural fields) and ranching, mining (gravel pits to the south and a large volcanic cider mine to the north), and community/commercial facilities to the northeast, east, and southeast of the site.

Regional modifications (within 5 miles) include one double-circuit wooden pole transmission line, approximately 2 miles to the south; two substations (one 2 miles to the south, and one 5 miles southeast of the Project site); and a single-circuit transmission line running parallel to NV 373 on the east side. Other regional cultural modifications include major transportation corridors US 95, NV 373, and numerous local roads that border the Project site on three sides.

The local setting within, and immediately adjacent to the Project area, has been modified by several utility lines including single-pole, wooden distribution lines (one crossing the Project site east to west and one crossing north to south), two cell phone towers, and a radio transmission tower directly east of the site.

3.12.2 Regulatory Framework – VRM System

Pursuant to FLPMA, the BLM is required to consider scenic values of public lands as a resource that merits management and preservation, as determined through the land use planning process. As a response to the FLPMA, the BLM devised the VRM System, with the primary objective of managing public lands in a manner that will protect the quality of the scenic (visual) values of these lands (Information Bulletin No. 98-135). In this regard, the VRM system (BLM Handbook H-8410-1) provides guidance relating to the VRI methodology that the BLM implements to inventory scenic values, as well as assess potential effects to such resources based on the analysis of visual contrast. Following are descriptions of the VRI that were inventoried for the Project.

3.12.2.1 Visual Resource Inventory

Consistent with procedures and concepts as described above, VRI data were collected and/or developed when appropriate per Manual H-8410-1 (Visual Resource Inventory). The primary VRI includes Scenic Quality, Distance Zones, Visual Sensitivity all of which are combined to develop VRI Classes. In addition, public viewing locations (including their sensitivity to changes in the landscape) were identified and described (see section 3.12.2.3).

Scenic Quality – Scenic quality is defined by the BLM as the measure of the visual appeal of a tract of land. Scenic Quality Rating Units (SQRU) are established based on like physiographic characteristics including similar visual patterns, textures, colors, variety, etc. Once the SQRUs are delineated, an evaluation occurs and each SQRU is ranked A, B, or C based on; landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications (existing conditions). Scenic quality was provided by the BLM for inclusion in the VRI and subsequent impact analysis to scenery. Existing conditions based on the occurrences of cultural modifications within the landscape contribute to the overall visual character associated with a given area. Existing conditions can range from natural to completely modified based on the visual influence of transmission lines, transportation routes, and other structural features.

Distance Zones – Distance Zones represent the relative visibility of the landscape from viewing locations such as travel routes or observation points of sensitive views. KOPs are established to represent typical viewing distances and conditions associated with sensitive viewers. Three zones have been identified by the BLM which include foreground/middleground (0 to 5 miles), background (5 to 15 miles), and seldom-seen (areas that are not visible within the foreground-

middleground and background distance zones). A viewshed analysis is performed and combined with the distance zones information to finalize the inventory of distance zones.

Visual Sensitivity – Visual Sensitivity represents the relative sensitivity of a given tract of land and is based upon; type of user, amount of use, public interest, adjacent land uses, special areas, and other factors. Landscape sensitivity can range from high to moderate to low and largely is associated with SQRUs. It is important to note that although related, the sensitivity of the landscape does not equate to sensitivity of viewers or viewing locations within that landscape. Visual Sensitivity, mapped in the form of Sensitivity Rating Level Units (SLRUs) were provided by the BLM for the purposes of this analysis.

3.12.2.2 Visual Resource Management Classes

The VRIC classes are reviewed by the BLM in contect with other resource plans and objective and updated accordingly to determine VRM classes (depicted on Figure 3-19) ranging from Class I to Class IV. Following are the management objectives associated with VRM Classes:

- **Class I** – To preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention. Class I designation is reserved for special areas that requires maintaining a natural environment unaltered by man such as designated Wilderness Areas, Wilderness Study Areas, etc.

- **Class II** – To retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements found in the predominant natural features of the characteristic landscape.

- **Class III** – To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not be dominate the view of the casual observer. Changes must repeat the basic elements found in the predominant natural features of the characteristic landscape.

- **Class IV** – To provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

The proposed Project site is located in a designated Class IV landscape. VRM data for the Project site and adjacent area was developed by the Las Vegas Field Office, the results of which can be found in Section 3.12.4. This data establishes the baseline for which Project impacts are measured against for resource management compliance.

3.12.3 Data Collection Methods

3.12.3.1 Methodology

Figure 3-19 illustrates the methodology associated with the VRI and subsequent impact assessment for the Project. The inventory methods discussed below are consistent with the concepts found within BLM Manual H-8410-1 – VRI.

The Area of Potential Visual Effect (APVE) was defined using the BLM's definition of background distance zone, which is 5 to 15 miles. The visual resources inventory was conducted on federal, state, and private land within the APVE that may be affected by construction and operation of the proposed Project. A viewshed analysis, based on BLM direction, was conducted using GIS mapping to assess where the Project could be visible within a 50-mile radius of the proposed right-of-way. This larger area defines the visual ROI that will be assessed for the Project. The results of the viewshed analysis were used to establish KOPs which were used for subsequent analysis in Chapter 4. Data collected within the APVE and ROI were based on reviews of aerial photographs, topographic maps, planning documents, consultation with the BLM and affected municipalities, and field investigations.

3.12.3.2 Sensitive Viewers

The term sensitive viewers refers to sensitive viewing locations and their associated viewers. Residences, travel routes, or trails are examples of locations where viewers typically are sensitive to visual modifications of the landscape. Key Observation Points (KOPs) represent critical viewpoints or typical viewing conditions associated with sensitive viewers in the context of the Project. Potential sensitive viewers that may have views of the proposed Project are typically identified and field verified within the defined APVE background distance zone of 15 miles (BLM Manual H-8410-1); however, based on the large scale of the Project and per BLM direction, sensitive viewers were also identified in the ROI. The identification of sensitive viewers was based on a review of aerial photography, a review of regional and local topographic maps, the results of the 50-mile radius viewshed analysis, agency and public input, and field investigations including photo documentation using high-resolution photography. Sensitive viewers are anticipated to include:

- Travel routes – highways and roads used by origin/destination travelers, designated scenic or historic byways, and recreation destination roads (i.e., roads that provide recreation access)
- Recreation areas – existing recreation sites used for picnicking, camping, hiking, scenic overlooks, rest areas, or other recreational activities
- Residences – single-family, detached structures, and permanent mobile homes or mobile home parks

Sensitive viewers and subsequent KOPs were approved by the BLM and illustrated in Figure 3-21.

Figure 3-19 | VISUAL RESOURCE AND CONTRAST RATING METHODOLOGY | Amargosa Solar Energy Project

PROJECT DESCRIPTION
- Solar collection fields
- Power block
- Access road
- Transmission lines
- Road re-alignment

VISIBILITY ANALYSIS
(50 miles)

REGION OF INFLUENCE (ROI)

INVENTORY
(Affected Environment)

CHARACTERISTIC LANDSCAPE DESCRIPTION

SCENIC QUALITY (provided by the BLM)

Landscape Features:
- Landform
- Vegetation
- Water
- Color
- Adjacent scenery
- Cultural modifications

Existing Conditions:
- Transmission lines
- Agricultural and Industrial facilities
- Travel routes (paved and unpaved roads)

SENSITIVE VIEWERS AND KEY OBSERVATION POINTS

Viewer Type:
- Roads
- Trails
- Campgrounds
- Residences
- Recreation Areas

Viewer Sensitivity:
- Use volume
- Viewing duration
- Scenic/historic status
- Type of use
  - travel routes
  - recreation areas
  - residences

Viewing Conditions/ Orientation:
- Superior
- Level
- Perpendicular
- Screened
- Backdropped
- Inferior
- Parallel

VISUAL RESOURCE INVENTORY (VRI) AND CLASSES

Scenic Quality:
(provided by the BLM)
- Vegetation
- Water
- Color
- Adjacent scenery
- Cultural modifications

Distance Zones:
- Foreground/middleground (0-3, 3-5 miles)
- Background (5-15 miles)
- Seldom seen (not visible and beyond 7 miles)

Sensitivity Level Rating Units (SLRUs):
- User type
- Amount of use
- Public interest
- Adjacent land uses
- Special areas
- Other factors

VISUAL RESOURCE CONTRAST RATING
(Environmental Consequences)

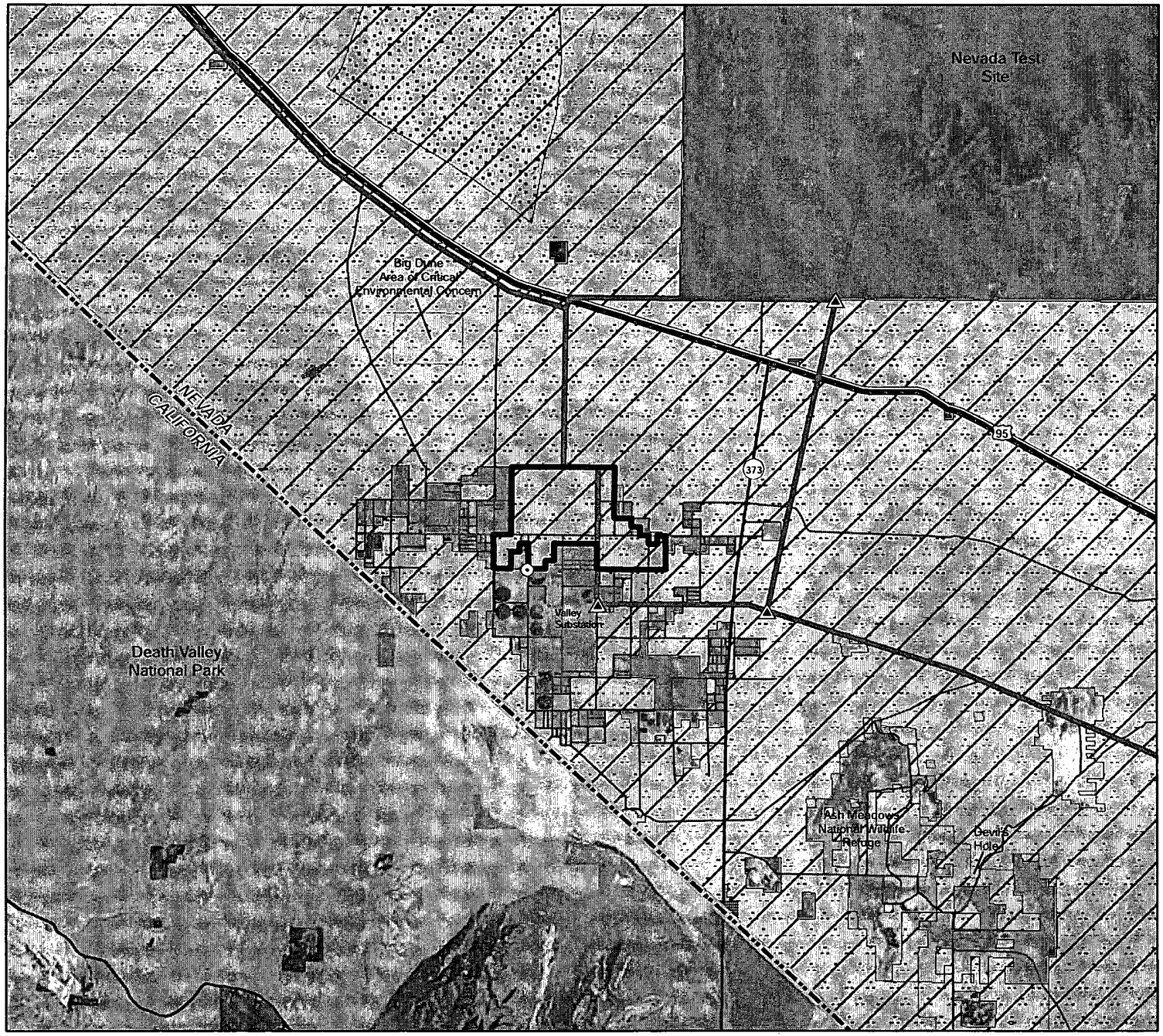
PROPOSED PROJECT ACTIVITY DESCRIPTION

Level of Contrast Based on:
- Existing cultural modifications (structures and roads)
  - form, line, color, texture
- Vegetation Patterns
  - form, line, color, texture
- Landforms and water-related elements
  - form, line, color, texture

SCENIC QUALITY IMPACTS BASED ON:
- Project contrast
- Vegetation
- Structures
- Landform
- Water

SENSITIVE VIEWER IMPACTS BASED ON:
- Project contrast
- Sensitivity
- Elevation
- Distance
- Screening or backdropping

Project Compliance with Visual Resource Management Classifications (Class IV)



Amargosa Farm Road Solar Energy Project (NVN-84359)

Visual Resource Management Inventory (VRI)

Figure 3-20

LEGEND

- Project Area

Surface Management

- Department of Energy
- National Park Service
- US Fish and Wildlife Service
- Private

Visual Resource Inventory Class

- Class IV

Visual Resource Management Class

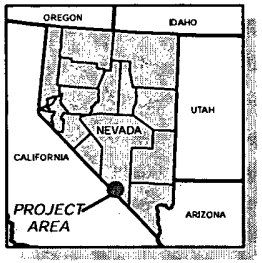
- Class III
- Class IV

Scenic Quality

- B
- C

General Reference Features

- Existing Transmission Line (<230kV)
- US Highway
- Existing Substation
- State Highway
- Proposed Project Well
- Local Road
- State Boundary



Source: Land Ownership, VRM, Scenic Quality - BLM, 2007;
Ash Meadows - USFWS, 2005;
Local Roads - TerraSpectra Geomatics, 2009;
Wells - Nevada State Engineer, 2008;
Transmission Lines, Substations - Platts, 2009;
Highways, Imagery - ESRI, 2009

September 2010

0 2 4 Miles

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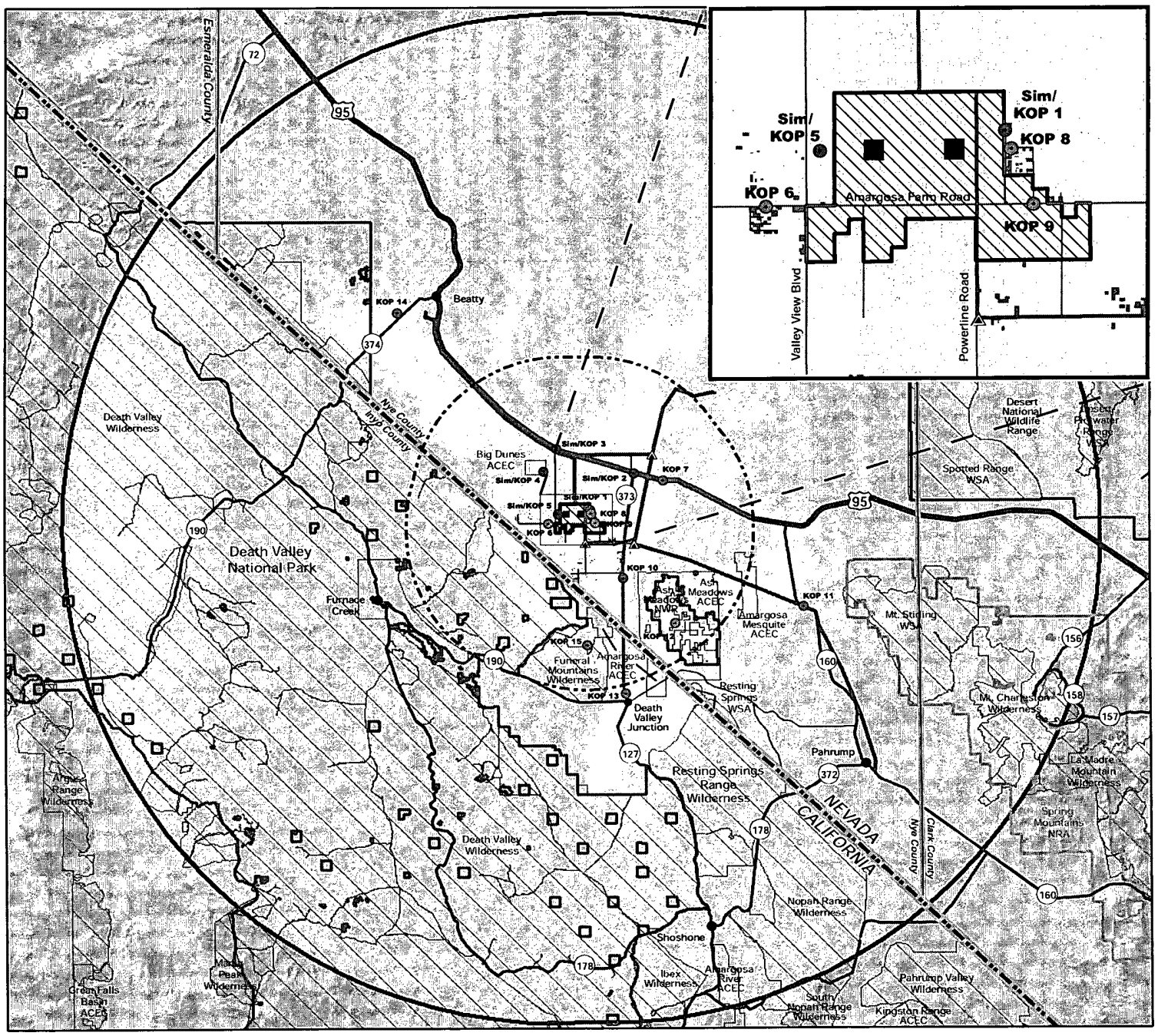


Amargosa Farm Road Solar Energy Project (NVN-84359)

Viewshed Analysis, Sensitive Viewers, and Key Observation Points Figure 3-21

Project Components

- Project Area
- Power Block

Project Features

- Background Zone (15-mile)
- Sensitive Viewer Inventory Boundary (50-mile)

Sensitive Viewers

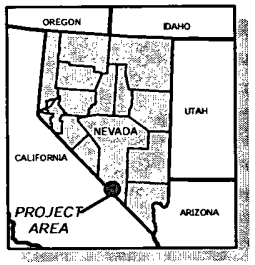
- Residence
- Travel Route
- Key Observation Point (KOP)
- Simulation Key Observation Pont (Sim/KOP)

Seen/Unseen

- Unseen
- Seen

General Reference Features

- Substation
- Below 230kV Transmission Line
- National Park
- National Recreation Area (NRA)
- National Wildlife Refuge (NWR)
- Wilderness Area
- Area of Critical Environmental Concern (ACEC)
- US Highway/ Interstate
- State Highway
- Local Road
- State Boundary
- County Boundary



Source: BLM, 2009; USFWS, 2005; ESRI, 2009; EPG, 2009; Platts, 2008

September 2010

0 9 18 Miles

In the context of this visual study, viewer sensitivity is defined as the degree of concern for changes to the landscape that, in the context of the proposed Project, may range from high to moderate to low. The sensitivity rating is based on the following five criteria: (1) type of use, (2) volume of use, (3) viewing duration, (4) concern for aesthetics, and (5) scenic or historic status. Scenic or historic status may increase the amount of use and viewing duration for viewers. Note that viewer sensitivity is explicit to sensitive viewers and although related, differs from the sensitivity levels associated with BLM's specific VRI (see Section 3.12.2.1). Table 3-41 provides a list of inventoried sensitive viewers. The described definition of sensitivity is associated with the sensitive viewers potentially affected by the Project and not associated with the sensitivity of the landscape.

3.12.3.3 Scenic Corridors

There are no designated scenic corridors in the Project area. US 95 is not a designated scenic highway; however, NDOT has determined that the highway is eligible as a scenic corridor called Mojave Desert Vista (from Clark County to the NV 266 junction, south of Goldfield, Nevada). The proposed scenic corridor concentrates on preserving the existing rural character of the region, including panoramic views and existing vegetation, improved recreation/travel information for Amargosa Valley at the rest area, and enhance the recreational opportunities afforded by the Big Dune recreation area and Ash Meadows NWR through signage improvements.

3.12.4 Visibility Analysis

Due to surrounding topography of Amargosa Valley, it was likely that sensitive viewers in the background distance zone (5 to 50 miles) would be screened from various Project components (e.g., solar fields, transmission lines within the Project area, and power blocks). Based on the results of the viewshed analysis and consultation with the BLM, 15 KOPs were selected to represent critical viewing conditions for each sensitive viewer group: travel routes, recreation areas, and residences. A summary of the KOPs by located is provided in Table 3-40. Detailed descriptions, including images and locations, are provided in the Contrast Rating Worksheets located in Appendix D.

Table 3-40 Key Observation Points

KOP #	Description
KOP #1	View facing west from Sandy Lane
KOP #2	View facing southwest from Lathrop Wells Rest Area
KOP #3	View facing south from US 95
KOP #4	View facing southeast from Big Dune Recreation Area
KOP #5	View facing west from Valley View Estates
KOP #6	View facing east-northeast from Amargosa Farm Road

Table 3-40 Key Observation Points	
KOP #	**Description**
KOP #7	View facing west-southwest from US 95
KOP #8	View facing west from Atomic Road
KOP #9	View facing northwest from Amargosa Farm Road
KOP #10	View facing north-northwest from NV 373
KOP #11	View facing west from SR 160
KOP #12	View facing northwest from Crystal Springs boardwalk at Ash Meadows NWR
KOP #13	View facing north-northwest from NV 373/CA 127 at Death Valley Junction, CA
KOP #14	View facing east-southeast from Rhyolite Cemetery near Beatty, NV
KOP #15	View facing south from Funeral Mountain Wilderness Area
KOP #16	View facing west from Sandy Lane (Scenic Quality Contrast Worksheet)

3.12.4.1 Project Specific Distance Zones and Visibility

Distance zones represent the relative visibility of a given landscape from sensitive viewing locations or KOPs.In the context of impact assessment, the BLM's established distance zones were used as the framework to establish Project specific distance zones appropriate for impact assessment which is further discussed in Section 4.12.

Visibility relates to the physical elements of the landscape and / or viewing locations that effect how the Project area is currently viewed. Visibility typically includes, but is not limited to; viewing position, screening (i.e., vegetation, topography, and existing municipal structures), and backdropping and/or skylining. Viewing position could range from superior, where the viewer is looking down at the Project area, to inferior, where the viewer is looking up at the Project area.

Screening is described as minimally, partially, and completely screened, and pertains to elements such as vegetation and topography that inhibit the visibility of the Project area. Landscape features can also can be skylined or backdropped by adjacent terrain, vegetation, or structures. When a landscape feature is backdropped, the color, texture, and form of the feature are subdued, thus reducing visibility. When a landscape feature is skylined, portions of it will appear above the horizon line and would be seen in the context with typically blue sky.

Table 3-41 Sensitive Viewers and Viewer Sensitivity Analysis

		Sensitivity					Visibility		
		Use Volume	Viewing Duration	Aesthetic Concern	Scenic/ Historic	Overall Sensitivity	Screening	Comments	KOP
Travel Routes									
U.S. Highway	US 95	High	Short	Moderate		Moderate	Partial (vegetation, topography)		Yes (2)
State Routes	State Route (NV) 374	Low	Moderate	Moderate		Moderate	Minimal to partial (topography, vegetation)		No
	NV 373	Moderate	Moderate	Moderate		Moderate	Yes (topography, vegetation)		Yes
	CA 127	Low	Moderate	Moderate		Moderate	Yes (topography, vegetation)		No
	State Route 160	Moderate	Short	Moderate		Moderate	Partial (topography, vegetation)		Yes
	Lathrop Wells Rest Area	Moderate	Moderate	Moderate		Moderate	Minimal to partial (topography, development)		Yes
Local Access Routes	Amargosa Farm Road	Moderate	Long	Moderate		Moderate	Minimal		Yes (2)
	Sandy Lane	Low	Long	Moderate		Moderate	Minimal		No
	Valley View Boulevard	Moderate	Long	Moderate		Moderate	Minimal		No
	Williamson Road	Moderate	Long	Moderate		Moderate	Partial (vegetation)		No
	Atomic Road	Moderate	Long	Moderate		Moderate	Partial (vegetation)		No

Table 3-41 Sensitive Viewers and Viewer Sensitivity Analysis

		Sensitivity					Visibility		
		Use Volume	Viewing Duration	Aesthetic Concern	Scenic/ Historic	Overall Sensitivity	Screening	Comments	KOP
	Barnett Street	Moderate	Long	Moderate		Moderate	Partial (vegetation)		No
	Frontier Road	Moderate	Long	Moderate		Moderate	Partial (vegetation)		No
	Senior Center Road	Moderate	Long	Moderate		Moderate	Partial (vegetation)		No
Recreation									
	Ash Meadows NWR – Visitor Center	Moderate	Moderate	High		High	Minimal to complete (topography, vegetation)		No
	Ash Meadows NWR – Crystal Springs Boardwalk Trail	Moderate	Moderate	High		High	Minimal to complete (topography, vegetation)		Yes
	Ash Meadows NWR – Crystal Reservoir boat launch	Moderate	Moderate	High		High	Minimal to complete (topography, vegetation)		No
	Ash Meadows NWR – Peterson Reservoir boat launch	Moderate	Moderate	High		High	Minimal to complete (topography, vegetation)		No
	Ash Meadows NWR – Devils Hole	Moderate	Moderate	High		High	Minimal to complete (topography, vegetation)		No
	Ash Meadows NWR – Point of Rocks Springs picnic area	Moderate	Moderate	High		High	Minimal to complete (topography, vegetation)		No

Table 3-41 Sensitive Viewers and Viewer Sensitivity Analysis

		Sensitivity					Visibility		
		Use Volume	**Viewing Duration**	**Aesthetic Concern**	**Scenic/ Historic**	**Overall Sensitivity**	**Screening**	**Comments**	**KOP**
	Amargosa Community Park	High	Moderate	High		High	Partial (vegetation)		No
	Amargosa River ACEC	Low	Moderate	High	Scenic	High	Complete (topography and vegetation)	No numbers for visitors, just comments on *rarely visited*	No
	Funeral Mountains Wilderness Area – unnamed hiking trails	Low	Moderate	High		High	Minimal	No numbers for visitors, just comments on *rarely visited*	Yes
	Death Valley National Park	High	Long	High	Scenic	High	Complete (topography)		No
	Death Valley National Park – Indian Pass	Low	Long	High		High	Complete (topography)		No
	Big Dune	Moderate	Long	Moderate		Moderate	Minimal to partial (topography, vegetation)		Yes
Residences									
	Amargosa Valley (east of Sandy Lane)	High	Long	High		High	Partial to Complete (vegetation)		Yes
	Amargosa Valley (downtown)	High	Long	High		High	Partial to Complete (development and vegetation)		Yes
	Dispersed Residences (west of Valley View Boulevard)	High	Long	High		High	Minimal to complete (topography, vegetation)		Yes

Table 3-41 Sensitive Viewers and Viewer Sensitivity Analysis

		Sensitivity					Visibility		
		Use Volume	Viewing Duration	Aesthetic Concern	Scenic/ Historic	Overall Sensitivity	Screening	Comments	KOP
	Dispersed Residences (south of Amargosa Farm Road)	High	Long	High		High	Complete (topography, vegetation)		No
	Death Valley Junction	High	Long	High		High	Complete (topography)		Yes
Community Facilities									
	Amargosa Senior Center	Moderate	Moderate	Moderate		Moderate	Partial (vegetation)		No
	Amargosa Valley School and Community Center	Moderate	Moderate	Moderate		Moderate	Partial (vegetation)		No
	AVIA Community Center/Amargosa Raceway	Moderate	Moderate	Moderate		Moderate	Partial to Complete (development and vegetation)		No
Historical									
	Tom Kelly Bottle House, Rhyolite	Moderate	Moderate	Moderate	Historic	Moderate	Complete (topography)	Only official SHPO Property in Rhyolite	No
	Rhyolite cemetery	Moderate	Moderate	Moderate		Moderate	Minimal to Complete (topography, vegetation)		Yes

3.12.5 Inventory Results

Scenic Quality

The Project area is sited on terrain and vegetation characterized by flat to slightly rolling plains, with minimal vegetative diversity associated with creosote flats. Based on scenic quality inventory data provided by the BLM (see Figure 3-20), the Project area is characterized as Class C scenery. The natural character of the setting has been modified by cultural modifications including transmission lines, access roads and structures associated with the Town of Amargosa Valley. The majority of the visual ROI is also associated with Class C scenery extending east to west from the Rock Valley Wash to the Amargosa River and north to south from US 95 to the Nevada/California border. Although not directly affected by the Project, Class B lands exist within the ROI and are associated with the mountain ranges characteristic of the Basin and Range.

Distance Zones

The Project is located approximately five miles south of US 95, approximately 4 miles west of NV 373, and ranging from 800 feet thru 5 miles from Amargosa Valley residents. Based on distance zone data provided by the BLM, the Project area is within the foreground/middleground Distance Zone.

Sensitivity Level Rating Units

The Project area was designated by the BLM as a Low Sensitivity Level. VRI data is available at the Southern Nevada District Office for the public to review.

Visual Resource Inventory Class

As previously stated, VRIC is a combination of Scenic Quality (Class C) , Distance Zones (foreground/middleground), and Sensitivity Levels (Low). The Project area is located within a Class IV VRIC.

Visual Resource Management Class

The proposed Project would be located on BLM designated VRM Class IV land. The management objective for Class IV lands is, "*To provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements*" (BLM VRM Manual 8410-1 VRI).

3.12.5.2 Cultural Modifications

- Cultural modifications that have modified natural landscape character were inventoried within the APVE using aerial photography and were field verified and include: Transmission/Distribution lines – electrical utility structures
- Industrial facilities – farm and ranching related facilities, mining
- Highways – paved with two or more traffic lanes and a median
- Primitive roads – regularly maintained dirt/gravel or unimproved roads
- Residences – Armargosa Valley residences and dispersed residences
- Community Facilities – local schools, community centers, churches

3.12.5.3 Nighttime Lighting

Existing or potential sources of nighttime light in the ROI include the residences of Amargosa Valley and several industrial or commercial operations, including mining facilities, commercial businesses on US 95, and agricultural facilities. Another source of lighting is the traffic along US 95. Las Vegas is a potential source of skyglow (i.e., nighttime light) in the region and is approximately 80 miles from Amargosa Valley.

3.12.5.4 Sensitive Viewers

Sensitive viewers within the 15-mile APVE and 50-mile ROI were initially identified as potential sensitive viewers. Sensitive viewers that were visually separated (screened) by topography and/or vegetation from the proposed Project were determined to have no effect and were documented as such. Refer to Table 3-41 for inventoried sensitive viewers.

Travel Routes

U.S. Highways – Travelers on these highways typically have moderate sensitivity and are typically focused on commuting to a destination with moderate concern of aesthetics.

- **US 95 (KOP 3, KOP 7)** – This eligible scenic corridor is a major regional transportation highway for local travelers between Las Vegas and Beatty, and a major connector route from Las Vegas and the Reno area that eventually connects to California. Travelers along this route typically are focused on utility over aesthetics and would have a short viewing duration of the Project in the background to middleground distance zone. The proposed Project would be back-dropped by the northeastern edge of the Funeral Mountains (Death Valley National Park) to the southwest, and partially backdropped by the Resting Spring Mountain Range to the southeast for east-bound travelers (KOP 3) and by the Funeral Mountains for west-bound travelers.

State Routes – These routes typically have travelers with moderate sensitivity with a moderate concern for aesthetics. Travelers on these routes are more frequent (local) travelers with a concern for shorter trips (commute) to their destinations over aesthetics.

- **NV 373 (KOP 10)** – This local travel route is used primarily by residential travelers and travelers to local community facilities. NV 373 is a primary travel route to Ash Meadows NWR and an alternate route to Death Valley National Park. The proposed Project would be in the middleground with partial screening due to vegetation and slight rolling topography from a level viewpoint. Travelers would typically travel at a moderate rate of speed connecting to local residences and local commercial facilities (e.g., convenient stores, casino, bank).

- **NV 160 (KOP 11)** – This regional travel route is used primarily by local commuters to and from Pahrump and the small community of Crystal and US 95. Travelers along NV 160 are typically traveling at a moderate rate of speed, although the road is an alternate travel route for recreational visitors to Death Valley National Parkand Humboldt-Toiyabe National Forest. The proposed Project would be located in the background distance zone (more than 15 miles) and backdropped by the Funeral Mountains. Some sections of NV 160 provides a superior view of Amargosa Valley.

- **CA 127 (KOP 13)** – This travel route is a continuation of NV 373 into California. CA 127 is primarily for travelers to Death Valley Junction; an alternate connection to Pahrump, Nevada and Death Valley National Park from Nevada; and a primary travel route to Ash Meadows NWR from California. The Project would be in the background with partial screening due to vegetation and slight rolling topography from a level viewpoint.

- **NV 374 (KOP 14)** – This travel route is used primarily by recreation travelers between Beatty and Death Valley National Park. Travelers along this route typically travel at a moderate rate of speed with a higher concern for aesthetics. The proposed Project would be visible in the background distance zone (more than 15 miles) from a superior viewing position.

- **Lathrop Wells Rest Park (KOP 2)** – Lathrop Wells Rest Park is an NDOT rest area for travelers along US 95. Visitors to the rest area would have short duration, level, and partially screened background views of the Project.

Local Access Routes – These routes typically have travelers with moderate sensitivity based on a moderate concern for aesthetics and moderate viewing durations due to local speed limits and local commuter routes. These routes provide direct access to local destinations such as commercial, agricultural, and residential areas that are frequented daily.

- **Sandy Lane** – This local street is adjacent to the Project site along the eastern boundary. Travelers would have the proposed Project in the foreground with no screening and a level vantage point.

- **Amargosa Farm Road (KOP 6, KOP 9)** – This local connector road is adjacent to the Project site along the southern boundary. Travelers heading east-bound would view the Project in the foreground distance zone with no screening and a level vantage point (KOP 6). West-bound travelers (KOP 9) will have level, partially screened to unobstructed foreground views of the Project. The realignment of Amargosa Farm Road

is part of the proposed Project which would result in direct, unobstructed views of the solar facility on the north side of the future road.

- **Valley View Boulevard** – This road is a primary travel route for residences and local travelers that connects US 95 to the Amargosa Valley community. The first mile off of US 95 is an alternate travel route to Big Dune recreation area with the primary entrance to Big Dune off of US 95, approximately 5 miles northwest of Valley View Boulevard. Travelers along Valley View Boulevard would have level views of the proposed Project in the middleground to foreground distance zone as one travels south. The potential for skylining would be greater for travelers along Valley View Boulevard than any other viewer in the ROI.

Recreation Areas

These areas typically have visitors (viewers) with primarily high sensitivity to landscape change based on their expectation for high quality landscapes and long viewing durations. For some recreation viewers, aesthetics are second to the actual recreation activity, such as target shooting or OHV activities.

- **Ash Meadows NWR (KOP 12)** includes recreation travel routes, trails, and trailheads, as well as wilderness and wildlife viewing opportunities. Due to a high concern for aesthetics and wildlife viewing and concern for solitude, viewer sensitivity would be high. Users would have level to slightly inferior views of the proposed Project in the background distance zone. However, the potential for direct unobscured views is low due to topography and vegetation. Death Valley National Park manages Devils Hole, a 40-acre site within Ash Meadows. Distant views of the proposed Project from Devils Hole would be completely screened by topography.

- **Death Valley National Park** is a major tourist destination drawing approximately 1 million visitors (viewers) per year. Visitors to all formalized trailheads, in-park travel routes, visitor centers, and campgrounds/picnic areas will not have views of the proposed Project because the topography of the Funeral Mountains physically separates formal recreation areas with the park and Amargosa Valley.

- **Big Dune (KOP 4)** – Big Dune recreation area is an area of approximately 1,000 acres consisting of natural sand dunes on BLM land that is easily accessible to the public. The primary recreation is OHV use on informal trails throughout the recreation area. OHV users typically focus their attention on their immediate surroundings, typically decreasing their overall concern/expectations for aesthetics. These moderate sensitivity viewers would view the Project in the middleground for short durations. In addition to OHV activities, Big Dune offers primitive camping, including recreational vehicle camping.

- **Funeral Mountains Wilderness (KOP 15)** – The wilderness located approximately 10.5 miles south of the Project area offers dispersed recreation within the wilderness area and non-vehicular access to Death Valley National Park. The Funeral Mountain Wilderness is closed to vehicular traffic, but is open to non-vehicular pedestrian traffic who would have a superior, background view of the proposed Project. Several unnamed

trails are oriented north-south in the narrow valleys between mountains and offers views of the Amargosa Valley (KOP 15). Visitors to Funeral Mountain Wilderness are anticipated to have moderate to long viewing durations and a high concern for aesthetics.

- **Amargosa River ACEC** – Three distinct units comprise the Amargosa River ACEC, with the nearest unit being the Upper Amargosa Mesquite Bosque Unit – a 2,720-acre site west of CA 127 and south of the Nevada/California state line. The ACEC is situated around the Amargosa River and is located 8 miles south of the Project area. The proposed Project would not be seen from the Upper Amargosa Mesquite Bosque Unit. The Upper Amargosa Mesquite Bosque Unit was established primarily as a unit of the Amargosa River ACEC due to its recreation value and the natural setting "provides opportunities for activities such as sightseeing, bird and wildlife viewing, photography, and solitude." The Upper unit visitors would not have views of the Project area due to topography and vegetation.

Residences

Each grouping of residences listed below are anticipated to have a high sensitivity based on a long viewing duration, and heightened concern for aesthetics or changes in the landscape. Development within Amargosa Valley can be characterized as low density (1-acre lots and larger). All residences are located within the Amargosa Valley in which the proposed Project would be located and all have level viewing positions. A large number of residences immediately adjacent to the Project area have dense and mature vegetation borders around their respective properties, which tend to screen views toward the Project area. The majority of the vegetation screening is Salt Cedar, an evergreen invasive tree that is known for its size and dense foliage.

- **Valley View Estates (KOP 5)** – Residential viewers in Valley View Estates and along the western side of Valley View Boulevard are typically more dispersed and would view the proposed Project in the foreground. Two partially constructed houses along Frontier Road between Valley View Boulevard and the Project site have no vegetative screening and would have level, unobstructed foreground views of the Project.

- **Residents along Sandy Lane (KOP 1)** would have direct, unobstructed foreground views of the proposed Project from a level viewing position. However, for some viewers, mature vegetation partially screens views toward the Project area. The residential units of Sandy Lane would be within 50 feet of the Project right-of-way and 700 feet of the proposed Project facilities.

- **Residences east of Sandy Lane (KOP 8 representational of these residences)** – Residential viewers in Amargosa Valley east of the Project site would have foreground, unobstructed to completely screened views of the Project, respectively. A large number of residences in this area have mature vegetation that follow property lines in a straight, linear fashion which provides screening of the Project area.

- **Residences south of Amargosa Farm Road** – Residences south of the Project area are dispersed and are typically located within farming complexes. Residences in this area

would have level, foreground to middleground partially to fully screened views of the proposed Project.

Community Facilities

- **Amargosa Valley School and adjacent Community Center** – Providing services to local residents, these facilities are level with the proposed Project and are generally surrounded by vegetation and residential structures. Views of the proposed Project would therefore be partially to fully screened and in the foreground of viewers using these facilities. Sensitivity to landscape change is typically moderate because views are largely focused inward and the facilities themselves occur with a modified rural- to suburban setting.

- **Community Park, Amargosa Senior Center, and AVIA Community Center** – These facilities offer local residents recreational and social opportunities, with the park having outdoor recreational opportunities. The community park and Senior Center have vegetative screening along the western boundary of their respective properties, partially screening foreground views of the proposed Project. Viewers from the AVIA Community Center would have foreground to middleground views of the proposed Project, partially screened by residences and their associated vegetation closer to the Project area. Sensitivity is anticipated to be moderate for viewers using these facilities.

Historic Features

- Rhyolite is a historic Ghost Town and associated cemetery with no commercial business or occupied residences. The cemetery (KOP 14) is located approximately 25 miles northwest from the Project area with potential views in the background. Visitors to Rhyolite are typically there for a short duration as most are passers-thru to other destinations. Viewers would have superior views with short to moderate time durations. Due to topography between the Project site and Rhyolite, the majority of the ghost town, including Tom Kelly Bottle House (the only SHPO listed property in Rhyolite) is completely screened by Ladd Mountain. For the remaining properties not screened by Ladd Mountain, rolling topography as well as atmospheric conditions due to the distance from the Project reduces the potential visibility of the proposed Project.

3.13 HUMAN HEALTH AND SAFETY/HAZARDOUS MATERIALS

Certain chemicals and materials to be used during the construction and operational phases of the proposed Project are characterized as hazardous materials. In addition, construction and operational activities would generate certain hazardous and non-hazardous solid waste streams. This section discusses existing conditions in the Project area relevant to hazardous materials and hazardous and non-hazardous waste. Regulations that would govern the management of these materials and waste during construction and operation are described. The types of materials to be used or types of waste generated during construction and operations, and the potential impact on the human environment are described in Chapter 4.

3.13.1 Affected Environment

A consideration for health and safety/hazardous materials analyses is the proximity of residential and other sensitive receptors, such as schools, daycare centers, emergency response facilities, and long-term care facilities. The nearest sensitive receptor is the area surrounding the Amargosa Community Complex, which is located approximately 0.5 mile east of the proposed Project site and adjacent to the community center, town offices, the emergency services center, sheriff's substation, a town library, the health clinic, and the Amargosa Valley School. The Amargosa Valley Community Complex also includes a residential area between Sandy Lane and Williamson Road. Several homesteads are located west of Valley View Boulevard, approximately 0.5 mile west of the proposed Project site. The area north and south of the Project site is primarily undisturbed desert land.

The general population may include sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses. In addition, the location of the population in the area surrounding the Project site may have a large bearing on health risk. The potential impact on sensitive receptors from construction and operation of the proposed Project is described in Chapter 4.13.

3.13.2 Potential Hazardous Wastes, Contaminated Soils/Groundwater

There is potential for the Project site to have some level of contamination due to prior land uses or from surrounding land uses. Examples of past and current land uses that could have resulted in unknown contamination include the following:

- Rural residences and farms that commonly have old or inactive underground storage tanks
- Pesticide-polluted runoff from agricultural properties
- Commercial and industrial sites (historic and current) that could have soil or groundwater contamination from unreported hazardous substance spills

The importance of disclosing information about potentially hazardous sites is to protect worker health and safety and to minimize public exposure to hazardous materials during construction and waste handling. If encountered, contaminated soil may qualify as hazardous waste, thus requiring handling and disposal according to local, state, and federal regulations.

Table 3-42 lists potential contaminant sources within 2 miles of the Project site. This information was obtained from the Wellhead Protection Plan for Nye County Operated Systems in Amargosa Valley (2006).

Table 3-42 Inventory of Potential Contaminant Sources Within 2 Miles of the Project Area

Facility ID	Risk	Comments
Substations	A – high	Electrical Substation
Storage Facility Exchange	A, C – high	Heavy equipment, trailers, tanks, railroad freight car line
Turquoise ST PSP	A,C – high	PSP, construction vehicles, heavy equipment
Avia Community Center	A,C – high	Cinder block building, shelter, asphalt parking
Amargosa Raceway Park	B – mod	Sand drag, baseball field, playground, asphalt parking
Amargosa Desert Memorial Cemetery	D – mod	Cemetery, decaying corpses
Amargosa Valley Volunteer Fire Department	A,C, D – mod	Multiple buildings, parking lot, ambulance, fire, sheriff
Amargosa Valley Medical Center	D – low	Medical care facility, parking lot
Amargosa Valley Library	B, C – mod	Library, Community Environmental Monitoring Program Station
Amargosa Valley Community Center	A, C – mod	Large building
Amargosa Valley Maint. Facility	A, C – high	Equipment storage yard
Amargosa Elementary School	B, C – mod	School building, parking lot
Amargosa Valley Park Ballfield	B, C – high	Park and ball field, maintenance building
Farm Equipment Storage Unused	A, C – high	Scrap pile for old and used farm equipment
PSP Property 514 Farm Rd.	A, C – high	Drums, cars, tractor, metal shed
Amargosa Valley Country Store	A, B, C – mod	Local general store, aboveground storage tank
Church of Amargosa	B – mod	Church building, parking lot, playground
Heavy equipment dumpsite	A, C – high	Construction site, water tanks, fuel trucks
Irrigated field NW Corner	B – mod	Irrigated field
Irrigated field SE Corner	B – mod	Irrigated field with some scrap vehicles
LG Pine Nursery Irrigated Field	B, C – high	Nursery, irrigated field
VEA Substation	A – high	Switching Station
West Anvil Agricultural. Pump Fuel Tank	A – high	Irrigated field, water pump, fuel tanks
West Anvil Farm Equipment Storage	A, B, C – high	Farm equipment storage, old trucks, farm equipment, metal building
Irrigated Field Equipment Storage	B – mod	Old mobile homes, rusty car, 55 gallon drum, semi trailer
Antenna Array Prop. 858	A, B, C – high	Antenna array, fuel tank, sheet metal shed, vehicles
Industrial Building	A, B, C – high	Aboveground storage tank, mobile homes, buildings

Table 3-42 Inventory of Potential Contaminant Sources Within 2 Miles of the Project Area		
Facility ID	**Risk**	**Comments**
Funeral Mountain Ranch	B – high	Hay and straw farm, above ground diesel tanks, used vehicles, farm equipment, junk
Private Farm Fuel Tanks	A – high	Farm homesite, farm equipment, horses, fuel tanks
Corral with a two-story Shed	A, C – low	Sheds
Commercial Building	A, B, C – high	Metal building, containers
A = volatile organic compounds, B = synthetic organic compounds, C = inorganic compounds, D = microbiological		

3.13.3 Regulatory Framework

3.13.3.1 Hazardous Materials

Use, storage, and disposal of hazardous materials are regulated by numerous local, state, and federal laws. Table 3-43 summarizes regulations applicable to storage and use of hazardous materials.

Table 3-43 Summary of Applicable Regulations for the Use, Storage, and Disposal of Hazardous Materials	
Regulation	**Requirements/Applicability**
CERCLA or Superfund, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA): 42 USC § 9601 et seq. Title 40 CFR Part 302	Requires notification to various agencies when there is a release of hazardous substances from a facility.
Emergency Planning and Community Right to Know Act of 1986 (EPCRA), commonly known as SARA Title III: 42 USC § 11001 et seq.; Title 40 CFR Parts 350, 355 370, and 372	Requires inventory reporting, planning, and reporting for storage and release of hazardous and acutely hazardous materials.
EPCRA, § 302 (Pub. L. 99–499), 42 USC 11022	Requires agency notification if extremely hazardous substances are stored in excess of Threshold Planning Quantities.
EPCRA, § 311, (Pub. L. 99–499, 42 USC 11021)	Requires that either material data safety sheets for all hazardous materials or a list of all hazardous materials be submitted to Nevada Emergency Response Commission and local fire department.
EPCRA, § 313, (Pub. L. 99–499, 42 USC 11023)	Requires annual reporting of releases of hazardous materials.
OSHA 29 USC Section 651 et seq., Title 29 CFR Part 1910 Safety and Health Regulations for Construction: Title 29 CFR Part 1926	Specifies standards for hazardous materials storage, handling, and worker protection in emergencies.

Table 3-43 Summary of Applicable Regulations for the Use, Storage, and Disposal of Hazardous Materials

Regulation	Requirements/Applicability
Oil Pollution Prevention: Title 40 CFR Part 112	Requires the preparation of a SPCC Plan if storage capacity exceeds certain volumes, and should there be a reasonable possibility that the tank(s) may discharge oil into navigable waters of the United States.
Hazardous Materials Transportation §§ 49 CFR 171-172	Requires transporters of hazardous materials to properly label, manifest, package, and ship hazardous materials.
Chemical Accident Prevention Provisions, Title 40 CFR Part 68	Requires the preparation of a Risk Management Plan if certain listed toxic or flammable substances are used in excess of the listed threshold quantity.
Chemical Facility Antiterrorism Standard (CFATS), 6 CFR Part 27	Requires facilities that possess any "chemicals of interest" above threshold quantities must register and provide specified information to the Department of Homeland Security.
Hazard Communication (HAZCOM) Program 29 CFR § 1910.1200 Safety and Health for Construction 29 CFR § 1926.1 et seq	Requires employers to implement HAZCOM Standard that gives workers the right to know the hazards and identities of chemicals in their workplaces (29 CFR 1910.1200) Requires written procedures and personnel protective equipment for employees working with hazardous materials.

Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC Section 9601 et seq.; Title 40 CFR Part 302. CERCLA (also known as Superfund) prescribes that the National Response Center be notified for any release of a reportable quantity of a hazardous substance (42 USC Section 9603); describes notification requirements for any potentially injured parties in connection with any such release (42 USC Section 9611(g)); and sets forth requirements for demonstration of financial responsibility in connection with the storage of hazardous substances (42 USC Section 9608(b)).

Superfund regulations define "hazardous substance" as any material appearing on lists referenced in Section 101, 42 USC Section 9601(14). The EPA's regulation, at Title 40 CFR Section 302.4, sets forth the list of hazardous substances under CERCLA and the reportable quantities for each.

Emergency Planning and Community Right to Know Act of 1986, 42 USC Section 11001 et seq.; Title 40 CFR Parts 350, 355, 370, and 372. The EPCRA is a stand-alone law passed in 1986 as part of the SARA, and is known as SARA Title III. Its purpose is to encourage and support emergency planning efforts at the state and local levels, and to provide the public and local governments with information to react to hazardous materials emergencies, as well as providing access to information about hazardous materials to the public.

The EPCRA requires each state to have a State Emergency Response Commission (SERC). The Nevada SERC is established by NRS 459.738. The SERC designates planning districts within the state and appoints Local Emergency Planning Committees (LEPC) to coordinate the

activities of each planning district. The SERC has designated each county as a planning district, and each county has designed the LEPC with the approval of the SERC.

EPCRA specifies what kinds of chemical releases and quantities require notification, to whom reports and notification are required to go to, and establishes threshold planning quantities. The provisions of EPCRA require industries to comply with reports of storage, manufacture, and releases to specific agencies. Along with these reporting requirements, fees required by NAC 459.9918, 459.99181, and 459.99182, and NRS 459.744 are collected and granted to state and local agencies to provide assistance in planning, training, and equipment activities to prevent, respond to, and mitigate hazardous materials incidents.

Occupational Safety and Health Standards, 29 USC Section 651 et seq.; Title 29 CFR Part 1910 and Safety and Health Regulations for Construction, Title 29 CFR Part 1926. These standards require employee training, PPE, safety equipment, and written procedures, programs, and plans for ensuring worker safety when working with hazardous materials or in hazardous work environments. Although intended primarily to protect worker health and safety, these requirements affect general facility safety. To comply with these requirements, the Project will prepare and implement appropriate worker health and safety plans and policies.

Oil Pollution Prevention, Title 40 CFR Part 112. The Oil Pollution Prevention regulations require the preparation of an SPCC Plan if oil is stored at the facility in excess of 1,320 gallons in aboveground storage, and should there be a reasonable possibility that the tank(s) may discharge oil into navigable waters of the United States. The SPCC regulations place restrictions on the management of petroleum materials; therefore, SPCC regulations have some bearing on hazardous materials management.

Hazardous Materials Transportation Act, 49 CFR 171-172. The Hazardous Materials Transportation Act regulates transportation of hazardous materials, and is implemented by the USDOT under 49 CFR Parts 171-179. Analogous requirements are promulgated for hazardous waste under 40 CFR Part 263 by the EPA. The Hazardous Materials Transportation Act requires chemical manufacturers and hazardous waste generators and transporters to follow certain preparation, packaging, handling, loading/off-loading, routing, emergency planning, notification, and insurance requirements.

The Hazardous Materials Transportation Act requirements supplement the RCRA requirements regarding hazardous wastes. To comply with these requirements, employees who are involved in the shipping or receiving of chemicals, or shipping parts, products, or subassemblies that could be contaminated with hazardous substances, wastes (or residue) must follow the specified procedures for packaging, labeling, and shipping of these regulated materials.

Chemical Accident Prevention Provisions, Title 40 CFR Part 68. Title 40 CFR Part 68 requires the preparation of a Risk Management Plan if certain listed toxic or flammable substances are used in excess of the listed threshold quantity. The Risk Management Plan addresses in detail the emergency plan implemented at the facility and the response actions planned by the facility in the event of a hazardous materials release. The Risk Management Plan is based on studies identifying potential hazards associated with the handling of the listed materials used at the facility.

Two chemicals listed as Chemicals of Interest in the regulation, propane and acetylene, would be used on-site. However, only propane will be stored or used on-site during construction or operation of the Project in excess of the applicable threshold quantity. A maximum of approximately 76,000 pounds of propane will be stored above the threshold of 10,000 pounds. The amount of acetylene that will be stored on-site will be well below the applicable threshold of 10,000 pounds.

Pursuant to Title 40 CFR Section 68.126, flammable substances listed in Tables 3 and 4 of Section 68.130 are excluded from all provisions of the Federal Chemical Accident Prevention regulations when said substances are used as fuel or held for sale as fuel at a retail facility. Therefore, a Risk Management Plan would not be required for the proposed Project.

Chemical Facility Antiterrorism Standard, Title 6 CFR Part 27. The CFATS of the Department of Homeland Security regulations requires that facilities that use or store certain hazardous materials in substantial quantities submit information to the Department of Homeland Security so that a vulnerability assessment can be conducted to determine what security measures should be implemented to ensure facility security. The administering agency is the Department of Homeland Security.

The Project proposes to use two chemicals listed as Chemicals of Interest in the regulation: propane and acetylene. However, only propane will be stored or used on-site during construction or operation of the Project in excess of the applicable threshold quantity. A maximum of approximately 76,000 pounds of liquefied petroleum gas (LPG) (principally propane) will be stored and present in each of the two power generation units on the Project site; this is above the threshold of 60,000 pounds. The amount of acetylene that will be stored on-site will be well below the applicable threshold of 10,000 pounds. The CFATS will apply to the Project for propane.

3.13.3.2 Wastes, Hazardous and Regulated Non-Hazardous Solid Waste

The laws and regulations applicable to hazardous wastes and regulated, non-hazardous solid wastes that would be generated at the proposed Project facility are summarized in Table 3-44.

Table 3-44 Summary of Regulations Applicable to Hazardous and Non-Hazardous Wastes

Regulation	Requirements/Applicability	Administering Agency
Federal		
RCRA 42 USC s/s 6901 et. Seq. (1976) 40 CFR Part 260, 261, 262 Hazardous Waste Management applicable to Generators	Requires hazardous waste generators to obtain an EPA Identification number and annually register with the NDEP to accumulate and store hazardous waste for no more than 90 days and ship hazardous waste under a manifest to a licensed disposal site. Requires generator to identify and profile hazardous waste, store hazardous waste in appropriate containers, label containers stored on-site and transported to disposal site, and train	EPA Region IX, NDEP

Table 3-44 Summary of Regulations Applicable to Hazardous and Non-Hazardous Wastes		
Regulation	**Requirements/Applicability**	**Administering Agency**
	operators in hazardous waste management.	
RCRA 42 USC s/s 6901 et. Seq. (1976) 40 CFR 263 Hazardous Waste Transportation, NRS 459	Requires hazardous waste generator to use registered transporters of hazardous waste that have an EPA ID number, use manifests to accompany waste shipments, and proper cleanup of any hazardous waste discharges.	EPA Region IX, NDEP, NDOT
Universal Waste 60 FR 25542, May 11, 1995, as amended at 64 FR 36488, July 6, 1999; 70 FR 45520, Aug. 5, 2005 40 CFR 273	Requires management, employee training, and proper disposal of universal waste that includes batteries, fluorescent lamps, mercury switches, and pesticides.	EPA Region IX, NDEP
Used Oil Solid Waste Disposal Act, as amended (42 USC 6905, 6912(a)), 6921 through 6927, 6930, 6934, and 6974); and CERCLA (42 USC 9601(37) and 9614(c)). 40 CFR 279 NAC Chapter 444	Requires generators of used oil to prevent spills and correctly label, store, transport, and dispose/recycle used oil.	NDEP, EPA Region IX

Resource Conservation and Recovery Act, 42 USC Section 6901 et seq. RCRA establishes requirements for the management of solid wastes (including hazardous wastes). The statute also addresses program administration, implementation and delegation to states, and enforcement provisions and responsibilities. Provisions are established for the generation, storage, treatment, and disposal of hazardous waste, including requirements addressing generator record keeping, labeling, manifests, emergency response information, training, and contingency plans.

Solid Wastes, Title 40 CFR Parts 240 – 257. These regulations were established by the EPA to implement the provisions of the Solid Waste Disposal Act. The regulations establish the criteria for classification of solid waste disposal facilities (landfills), provide operating standards for landfills, and provide storage requirements of solid wastes.

- Part 243 addresses general storage standards and recommended practices for solid wastes
- Part 246 addresses source separation for materials recovery guidelines
- Part 257 addresses the criteria for classification of solid waste disposal facilities and practices

Hazardous Wastes, Title 40 CFR Parts 260-268, 273, and 279. These regulations were established by the EPA to implement the provisions of RCRA. The regulations establish the

criteria for classification of materials as hazardous wastes, define hazardous waste generator requirements, and specify requirements for management of used oil and universal wastes.

- Parts 260 through 268 provide the basic framework for characterizing, transporting and manifesting hazardous waste, as well as the storage requirements and requirements for disposing of hazardous wastes to land
- Part 273 addresses management of hazardous universal wastes (i.e., batteries, mercury containing equipment, and lamps)
- Part 279 addresses management of used oil and universal wastes (i.e., batteries, mercury containing equipment, and lamps)
- The EPA implements the regulations at the Federal level. However, Nevada is an authorized state, and so the regulations are implemented by state agencies and authorized local agencies in lieu of the EPA.

Hazardous Materials Regulations, Title 49 CFR Parts 171–180. The USDOT has established standards for the transportation of hazardous materials and hazardous wastes. The standards include requirements for labeling, packaging, and shipping of hazardous materials and hazardous wastes, as well as training requirements for personnel completing shipping papers and manifests, vehicle placards, and security plans.

3.13.4 Spills

Title 40, CFR, Part 112 requires that any facility with aboveground storage capacity of 1,320 gallons or greater of oil design and implement a SPCC Plan. An SPCC Plan will be required for the proposed Project due to the amount of fuel to be stored onsite.

The proposed Project will be required to obtain a hazardous materials storage permit from the Nevada State Fire Marshal before any hazardous materials are stored on site in excess of the amount set forth in the International Fire Code, 2006 Edition. A list of hazardous materials stored on-site that are over the threshold will be submitted to the Nevada State Fire Marshal annually.

The EPCRA requires facilities that maintain Extremely Hazardous Substances on-site in quantities greater than corresponding Threshold Planning Quantities to cooperate in emergency plan preparation. The Proponent will cooperate in emergency plan preparation and designate a facility emergency coordinator to participate in the emergency response plan process with the LEPC. The LEPC is responsible for developing an emergency response plan for their emergency planning district, and providing information about chemicals in the community to citizens.

The National Oil and Hazardous Substances Pollution Contingency Plan, provides framework for the federal government to respond to both oil spills and hazardous substance releases. Under the plan, national and regional response teams are established to help plan, coordinate, and respond to discharges of oil or hazardous substances. The Proponent will be required to notify the National Response Center of any discharges or releases. In the event of a hazardous substance release, the National Oil and Hazardous Substances Pollution Contingency Plan authorizes the lead agency to initiate appropriate removal action. Decisions of action will be based on threats to

human or animal populations, contamination of drinking water supplies or sensitive ecosystems, high levels of hazardous substances in soils, weather conditions that may cause migration or release of hazardous substances, the threat of fire or explosion, or other significant factors affecting the health or welfare or the public or the environment.

3.13.5 Fuels and Fire Management

The Project area is located on federally managed land within Amargosa-Indian Springs; NV050-16 Wildland Urban Interface Fire Management Unit (FMU) (BLM 2004). The wildland portion of this FMU mainly consists of creosote bursage and Mojave scrub vegetation, with scattered stands of mesquite/acacia woodland (BLM 2004). The proposed project falls within an area and vegetation type where fire is uncommon according to historic BLM fire records (Oliver 2010). Between 1980 and 2003, three human/other caused fires have burned a total of 0.2 acres within the FMU (Oliver 2010).

Wildland fire protection on all BLM public lands within the FMU is provided by the BLM Southern Nevada District Office. Structural fire protection on private lands within this FMU is provided by the Amargosa Valley Volunteer Fire Department.

CHAPTER 4 - ENVIRONMENTAL EFFECTS

This chapter evaluates the environmental consequences that would result from construction and operation of the proposed Project, under the Proposed Action (dry-cooled alternative), wet-cooled alternative, and the No Action alternative. The impact analysis for environmental consequences focuses on potential direct, indirect, and cumulative effects on resources described in Chapter 3.0 – Affected Environment. In most cases, impacts are categorized and described without reference to facility type or location. As described in Chapter 3.0, the ROI varies depending on the resource being analyzed and the predicted locations of direct and indirect impacts from construction and operation of the proposed Project.

Direct effects are impacts that are caused by the construction and operation of the proposed Project and occur at the same time and place. These effects would result from the granting of the right-of-way by the BLM and subsequent construction and operation of proposed facilities. Indirect effects are those impacts that are caused by construction and operation of the proposed Project which are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include the effects of the withdrawal of groundwater, growth-inducing effects, and other effects related to induced changes in the pattern of land use, changes to the population density or growth rate, and related effects on the physical attributes of associated ecosystems.

The cumulative effects analysis is focused on the potential effects (direct and indirect) of construction, operation, and maintenance of the proposed Project combined with other past, present, and reasonably foreseeable future actions that could have effects in the ROI for a given resource. The CEQ (40 CFR § 1508.7) defines "cumulative impact" as: "...the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions."

4.1 AIR QUALITY

To determine the potential impacts of the Proposed Action (dry-cooled alternative) on air quality during construction and operations, site specific air quality dispersion modeling was conducted for the Project. Construction and operation related emissions at the Project site were modeled using the AERMOD model (version 09292). Criteria pollutant emissions were modeled to determine maximum air quality impacts. The maximum modeled concentrations were then added to ambient background concentration and compared to the applicable standards. For the analysis, 5 years of surface observations and upper air data (1988–1992) from the Mercury Desert Rock Airport in Mercury, Nevada (approximately 26 miles east of the proposed Project site), were used for dispersion modeling.

4.1.1 Proposed Action

4.1.1.1 Construction Phase Inventory and Emissions

Construction of the proposed Project is expected to take 39 months. During construction, emissions will be similar to those associated with any large industrial construction project. Construction activities will be staged to provide an efficient strategy for Project construction. Construction-related air emissions will include exhaust and fugitive dust from vehicle and construction equipment, windblown fugitive dust from grading, and other soil disturbing activities and the installation of the solar panels.

Emission tables in the Final EIS are site-specific. In the Draft EIS the air quality modeling was for a facility in California that utilized similar technology in a similar climate. However, because Nevada and California have different regulations for air quality monitoring and reporting, there is some inconsistency between what was reported on in the Draft EIS and what is now reported in the Final EIS. This inconsistency exists only because of the differing regulatory compliance measures for air quality modeling between Nevada and California. The tables below reflect the results of modeling that was done for the Project site, which is located in Nevada and would be regulated by the NDEP–BAPC.

Construction-related emissions would be transient in nature and may cause some unavoidable, localized short-term impacts. Since the Project surface disturbance will exceed 5 acres, a Class II Air Quality Permit for SAD would be required. The SAD permit could be a stand-alone permit if the grading for the Project began prior to the stationary air permit being issued, or it could be part of the stationary air permit (Phillips, personal communication, November 11, 2009). Table 4-1 summarizes projected maximum daily emissions during construction of the Project. Table 4-2 summarizes projected maximum annual emissions from Project construction.

Table 4-1 Maximum Daily Construction Emissions

Phase of Construction	NOx (lb/day)	VOC (lb/day)	CO (lb/day)	SO2 (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Power Plant (on-site)	1,042	116	554	2.25	1,009	188
Power Plant (off-site)	375	153	1,507	2.05	353	66
Source: AECOM 2010						

Table 4-2 Maximum Annual Construction Emissions

Phase of Construction	NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Power Plant (on-site)	130	14	68	0.28	120	22
Power Plant (off-site)	43	17	167	0.23	39	7
Source: AECOM 2010						

The exhaust emission factors used for the calculations of CO, VOC, NO_x, SO_x, and PM_{10} are model year and horsepower-based off-road emission factors for 2010, derived from the California Air Resources Board's OFFROAD2007 Model (version 2.0.1.2, December 15, 2007). The OFFROAD2007 Model calculates total daily emissions by equipment category (crane, dozer, grader, etc.), type of fuel (diesel, gasoline, etc.), and model year within engine horsepower ranges in a geographic area. The model also calculates activity rate (total operating hours per day) within the geographic area by equipment category, fuel, model year, and horsepower range. The total daily emissions were divided by the total daily operating hours to calculate emission factors (in pounds per hour) by equipment category, fuel, model year, and horsepower range (AECOM 2010).

4.1.1.2 Operational Phase Inventory and Emissions

Criteria pollutant emissions (i.e., NO_x, SO_x, CO, VOC, PM_{10}, and $PM_{2.5}$) are expected from each power plant unit during normal facility operations. The proposed plant will include two power block units, each of which consists of:

- One 35-MMBtu/hr LPG-fired auxiliary boiler used for start-up
- One 41-MMBtu/hr LPG-fired HTF heater used for freeze protection for the HTF
- One 300-Hp diesel-fired emergency fire water pump engine
- One 2292-Hp diesel-fired emergency generator engine
- One two-cell wet-cooling tower
- One HTF expansion/ullage system
- Maintenance vehicles

Summaries of emission estimates are provided in the following section. The emissions were calculated for each power plant unit, and the emissions from both power plant units were combined to estimate emissions for the proposed Project.

Auxiliary Boiler Emissions

Combustion of LPG results in the emissions of NO_x, SO_x, CO, VOC, PM_{10}, and $PM_{2.5}$. The assumptions made regarding auxiliary boiler operation used as the basis for emission calculations include:

- One 35-MMBtu/hr boiler per power plant unit, a total of two identical boilers for the Project
- LPG will be the only fuel used by the boilers
- Boilers to be equipped with ultra-low-NO_x burners
- Daily operation of each boiler is limited to 15 hours per day at 25 percent load, and 2 hours per day at full load

- Annual operation of each boiler is limited to 5,000 hours per year, with a duty cycle of 10 percent at full load and 90 percent at 25 percent load
- 100 percent of the PM_{10} emissions are $PM_{2.5}$
- Maximum controlled emissions are equivalent to maximum uncontrolled emissions, because the auxiliary boilers will not utilize add-on controls

Based on maximum annual operation, the boilers will operate at an average capacity factor of 18.6 percent. The fuel will be commercial grade LPG; the typical composition would be 97.5 percent propane and 2.5 percent butane. Boiler criteria pollutant emissions for a single boiler are shown in Table 4-3.

Table 4-3 Auxilary Boiler Criteria Pollutant Emissions

Pollutant	Emissions		
	Max Hourly (lb/hr)	Max Daily (lb/day)	Annual (ton/yr)
NO_x	0.39	2.24	0.32
VOC	0.18	1.01	0.14
CO	1.31	7.56	1.07
PM_{10}	0.35	2.01	0.28
$PM_{2.5}$	0.35	2.01	0.28
SO_x	0.40	2.27	0.32

Source: AECOM 2010

HTF Heater Emissions

Combustion of commercial grade LPG results in emissions of NO_x, SO_x, CO, VOC, PM_{10}, and $PM_{2.5}$. The assumptions made regarding HTF heater operation used as the basis for emission calculations include:

- One 41-MMBtu/hr HTF heater per power plant unit, a total of two identical HTF heaters for the Project
- LPG will be the only fuel used by the heaters
- Heaters will be equipped with ultra-low NO_x burners
- Operation of each heater is limited to 10 hours per day and 50 hours per year
- 100 percent of the PM_{10} emissions are $PM_{2.5}$
- Maximum uncontrolled emissions are equivalent to maximum controlled emissions, because the HTF Heaters do not have add-on controls

Based on 500 hours per year of operation at full load, the heaters will operate at an average capacity factor of 0.57 percent. The fuel will be commercial grade LPG. HTF heater criteria pollutant emissions for a single heater are shown in Table 4-4.

Table 4-4 Heater Criteria Pollutant Emissions			
Pollutant	Emissions		
	Max Hourly (lb/hr)	Max Daily (lb/day)	Annual (ton/yr)
NO_x	0.46	4.55	0.01
VOC	0.21	2.05	0.01
CO	1.54	15.40	0.04
PM_{10}	0.41	4.10	0.01
$PM_{2.5}$	0.41	4.10	0.01
SO_x	0.46	4.63	0.01
Source: AECOM 2010			

Emergency Diesel-Fired Engine Emissions

Combustion of diesel fuel results in the emissions of the criteria pollutants. The assumptions made regarding emergency engine operation used as the basis for emission calculations include:

- One 300-Hp diesel-fired fire water pump engine per power plant unit, a total of two identical fire water pump engines for the Project
- One 2292-Hp diesel-fired emergency generator engines per power plant unit, a total of two emergency generator engines for the Project
- All engines will use ultra-low sulfur (15 ppm) diesel fuel
- All engines have Tier 3 Certification
- The diesel fire water pump hours for each engine are based on a single 1-hour test per week, not to exceed 50 hours per year, and do not reflect emergency use
- The diesel fire emergency generator hours for each engine are based on one 1-hour test per week, not to exceed 50 hours per year, and do not reflect emergency use
- 100 percent of the PM_{10} emissions are $PM_{2.5}$
- Maximum controlled emissions are equivalent to maximum uncontrolled emissions, because emergency engines do not have add-on controls

Emission estimates for NOx, CO, VOC, and PM_{10} are based on emission factors for EPA Tier 3 certified engines. Emission estimates for SO_x are based on estimated fuel use of 15.3 gallons per hour for each engine with a heating value of 137,000 Btu per gallon and fuel sulfur content of 15 ppm. Fire water pump engine criteria pollutant emissions are shown in Table 4-5 and the emergency generator criteria pollutant emissions are shown in Table 4-6.

Table 4-5 Fire Water Pump Criteria Pollutant Emissions			
Pollutant	Emissions		
	Max Hourly (lb/hr)	Max Daily (lb/day)	Annual (ton/yr)
NO_x	1.883	1.883	0.047
VOC	0.099	0.099	0.002
CO	1.718	1.718	0.043
PM_{10}	0.099	0.099	0.002
$PM_{2.5}$	0.099	0.099	0.002
SO_x	0.003	0.003	0.000
Source: AECOM 2010			

Table 4-6 Emergency Generator Engine Criteria Pollutant Emissions			
Pollutant	Emissions		
	Max Hourly (lb/hr)	Max Daily (lb/day)	Annual (ton/yr)
NO_x	29.3	29.3	0.734
VOC	1.54	1.54	0.039
CO	16.7	16.7	0.418
PM_{10}	0.97	0.97	0.024
$PM_{2.5}$	0.97	0.97	0.024
SO_x	0.03	0.03	0.001
Source: AECOM 2010			

Cooling Tower PM_{10} Emissions

The solar power plant will utilize dry-cooling for the primary steam cycle, but will employ an auxiliary cooling tower to remove residual heat from the Balance of Plant equipment. Because cooling towers provide direct contact between the cooling water and the air passing through the tower, some of the liquid water may be entrained in the air stream and be carried out of the tower as "drift" droplets. PM_{10} is generated when the drift droplets evaporate and leave $PM_{2.5}$ formed by precipitation/crystallization of dissolved solids. Dissolved solids found in cooling tower drift can consist of mineral matter and chemicals used for corrosion inhibition.

The assumptions made regarding cooling tower operations that were used as the basis for the emission calculations include:

- One cooling tower unit per power plant unit, a total of two cooling tower units for the Project
- Circulation rate of 6,034 gallons per minute
- Cooling tower blowdown will contain a maximum of 2,000 milligrams per liter (mg/L) TDS
- Each cooling tower will be equipped with a drift eliminator with drift losses of less than or equal to 0.0005 percent by weight based on circulation flow rate
- Each cooling tower will have a maximum run time of 16 hours per day and 3,700 hours per year
- 100 percent of the PM formed is $PM_{10}/PM_{2.5}$
- Maximum controlled emissions are equivalent to maximum uncontrolled emissions, because the cooling tower drift eliminators are integral to the operation of the cooling towers and are not treated as add-on controls

PM emissions are calculated according to the method described in EPA's Compilation of Air Pollutant Emission Factors (AP-42), Section 13.4 Wet-Cooling Towers. Cooling tower PM_{10} emissions are shown in Table 4-7.

Table 4-7 Cooling Tower Emissions

Pollutant	Max Hourly (lb/hr)	Max Daily (lb/day)	Annual (ton/yr)
PM_{10}	0.03	0.73	0.13
$PM_{2.5}$	0.03	0.73	0.13
Source: AECOM 2010			

HTF Ullage System Vent Emissions

The total uncontrolled VOC emissions from the HTF expansion/ullage tank vent were estimated based on data provided by an existing solar plant (Kramer Junction Solar Energy Generating Systems facility), extrapolated to account for HTF system size. The assumptions made regarding HTF Expansion Tank operation that were used as the basis for the emission calculations include:

- One HTF ullage system per power plant unit
- The VOC emissions are controlled with the use of two carbon adsorption canisters in series, with an overall control efficiency of 98 percent
- VOC emissions are limited to a maximum 0.75 lb/hr or 1.5 lb/day after pollution control
- The HTF ullage system are vented for a maximum of 2 hours per day
- The maximum annual operation is estimated at 400 hours per year

The controlled and uncontrolled emissions are presented in Table 4-8. For these emission estimates, it is assumed that there will be no VOC emissions from waste load out of heavy ends from the ullage system as the heavy ends are expected to have a vapor pressure that is substantially lower than the HTF fluid itself, and the vapor pressure of HTF at ambient conditions is negligible.

Table 4-8 VOC Emissions for One HTF Ullage System Vent

	Max Hourly (lb/hr)	Max Daily (lb/day)	Annual (ton/yr)
VOC	0.75	1.50	0.15
Source: AECOM 2010			

VOC Emissions from Bioremediation

The facility will use bioremediation in an on-site land farm to remediate HTF-contaminated soils. Bioremediation will be conducted at ambient temperatures. At ambient temperatures, the vapor pressure of the HTF is negligible; therefore, the expected VOC emissions are negligible and have not been estimated for this application.

Fugitive VOC emissions may occur in the HTF piping in the solar field from components such as pumps, seals, flanges, and valves. The fugitive VOC emissions are estimated based on component count data obtained from a recent application filed for a solar facility in California (the Beacon Solar Energy Plant), then extrapolated to account for the relative difference in the proposed Project (HTF system) size. The assumptions made for the fugitive emission calculations include:

- Fugitive emissions can occur 24 hours per day, 365 days per year
- Fugitive emissions only consist of VOCs
- Maximum controlled emissions are equivalent to maximum uncontrolled emissions, because the fugitive emissions are not controlled

The fugitive pollutant emission factors were taken from the EPA 1995 Protocol for Equipment Leak Emission Estimates for Oil and Gas Production. Since the HTF has a very low vapor pressure, the values for Heavy Oil were used to estimate the emissions. The fugitive emissions are presented in Table 4-9.

Table 4-9 HTF Fugitive Emissions

	Max Hourly (lb/hr)	Max Daily (lb/day)	Annual (ton/yr)
VOC	0.18	4.39	0.80
Source: AECOM 2010			

Maintenance Vehicle Emissions

The facility will require periodic vehicle travel over the unpaved portions of the solar field to perform routine maintenance, including mirror washing, maintenance inspections and repairs of the piping network, herbicide application, and dust suppressant application. Criteria pollutant emissions are expected from the combustion of fuels in the vehicles, and fugitive PM emissions are expected from vehicle traffic on unpaved surfaces in the solar fields.

The emissions were calculated as the anticipated vehicle miles traveled multiplied by an emission factor for each pollutant. The fugitive PM_{10} and $PM_{2.5}$ emission factors take into account entrained unpaved road dust. Vehicle emissions are shown in Table 4-10.

Table 4-10 Motor Vehicle Criteria Pollutant Emissions for the Project

Vehicle	Maximum Hourly (lb/hr)								
	CO	VOC	NOx	SOx	Exh. PM_{10}	Fug. PM_{10}	Diesel PM	Exh. $PM_{2.5}$	Fug. $PM_{2.5}$
Mirror Wash Truck	0.061	0.012	0.120	0.001	0.003	32.994	0.003	0.003	3.300
Weed Abatement	0.017	0.003	0.033	0.000	0.001	8.989	0.001	0.001	0.899
Soil Stabilizer Application	---	---	---	---	---	---	---	---	---
Maintenance Vehicles	0.019	0.001	0.001	0.000	0.000	6.938	---	0.000	0.694
Total	**0.097**	**0.016**	**0.154**	**0.002**	**0.005**	**48.922**	**0.004**	**0.004**	**4.894**
Vehicle	**Maximum Daily (lb/day)**								
	CO	**VOC**	**NOx**	**SOx**	**Exh. PM_{10}**	**Fug. PM_{10}**	**Diesel PM**	**Exh. $PM_{2.5}$**	**Fug. $PM_{2.5}$**
Mirror Wash Truck	0.490	0.098	0.961	0.010	0.027	263.951	0.027	0.025	26.402
Weed Abatement	0.134	0.027	0.262	0.003	0.007	71.915	0.007	0.007	7.194
Soil Stabilizer Application	---	---	---	---	---	---	---	---	---
Maintenance Vehicles	0.154	0.005	0.012	0.001	0.001	55.507	---	0.001	5.552
Total	**0.778**	**0.130**	**1.235**	**0.014**	**0.036**	**391.373**	**0.035**	**0.033**	**39.148**
Vehicle	**Annual (ton/yr)**								
	CO	**VOC**	**NOx**	**SOx**	**Exh. PM_{10}**	**Fug. PM_{10}**	**Diesel PM**	**Exh. $PM_{2.5}$**	**Fug. $PM_{2.5}$**
Mirror Wash Truck	0.057	0.011	0.112	0.001	0.003	30.882	0.003	0.003	3.089
Weed Abatement	0.002	0.000	0.003	0.000	0.000	0.912	0.000	0.000	0.091
Soil Stabilizer Application	0.016	0.003	0.031	0.000	0.001	8.437	0.001	0.001	0.844
Maintenance Vehicles	0.026	0.001	0.002	0.000	0.000	9.188	---	0.000	0.919
Total	**0.100**	**0.016**	**0.148**	**0.002**	**0.004**	**49.419**	**0.004**	**0.004**	**4.943**

Source: AECOM 2010

Off-site Delivery Vehicles

Deliveries of various supplies, materials, and services to the facility will occur on a regular basis. These deliveries will result in additional truck travel on paved roads. The combustion of fuel in offsite delivery vehicle engines results in the generation of CO, VOC NO_x, SO_x, PM_{10}, and $PM_{2.5}$ emissions. Motor vehicle brake and tire wear and travel on paved roads with entrained road dust results in the generation of fugitive PM_{10} and $PM_{2.5}$ emissions. The assumptions made regarding the off-site vehicle emissions from LPG and other deliveries for the Project used as the basis for emission calculations include:

- Up to 10 miscellaneous deliveries to the facility per month (120 trips per year)
- LPG delivery is based on maximum boiler and HTF heater usage at both power plant units
- A LPG delivery truck can hold 8,000 gallons of LPG
- The LPG and other miscellaneous suppliers are located in Pahrump and Las Vegas
- The delivery trucks are heavy-duty diesel-fueled vehicles

Off-site delivery vehicle criteria pollutant emissions are shown in Table 4-11.

Table 4-11 Off-site Motor Vehicle Criteria Pollutant Emissions for the Project

Trip Type	Daily Emissions (lb/day)								
	CO	VOC	NOx	SOx	Exh. PM_{10}	Fug PM_{10}	Diesel PM	Exh. $PM_{2.5}$	Fug $PM_{2.5}$
Propane Delivery	1.565	0.413	5.593	0.006	0.241	0.245	0.241	0.221	0.085
Miscellaneous Delivery	3.130	0.826	11.186	0.013	0.482	0.489	0.482	0.443	0.171
Diesel Delivery	1.565	0.413	5.593	0.006	0.241	0.245	0.241	0.221	0.085
Maintenance Vehicles	0.385	0.013	0.029	0.003	0.003	0.459	---	0.003	0.161
Total	**6.64**	**1.66**	**22.40**	**0.03**	**0.97**	**1.44**	**0.96**	**0.89**	**0.50**
Trip Type	**Annual Emissions (ton/yr)**								
	CO	VOC	NOx	SOx	Exh. PM_{10}	Fug PM_{10}	Diesel PM	Exh. $PM_{2.5}$	Fug $PM_{2.5}$
Propane Delivery	0.176	0.046	0.629	0.001	0.027	0.028	0.027	0.025	0.010
Miscellaneous Delivery	0.094	0.025	0.336	0.000	0.014	0.015	0.014	0.013	0.005
Diesel Delivery	0.009	0.002	0.034	0.000	0.001	0.001	0.001	0.001	0.001
Maintenance Vehicles	0.008	0.000	0.001	0.000	0.000	0.010	---	0.000	0.003
Total	**0.288**	**0.074**	**0.999**	**0.001**	**0.043**	**0.053**	**0.043**	**0.040**	**0.019**

Source: AECOM 2010

Summary of Operational Criteria Pollutant Emissions

The total criteria pollutant emissions for the Project are summarized in Table 4-12.

Table 4-12 Summary of Project Criteria Pollutant Emissions

Emissions Period (Units)	Pollutant (includes stationary and on-site mobile sources)					
	NO_x	VOC	CO	PM_{10}	$PM_{2.5}$	SO_x
Hourly (lb/hr)	64.3	5.93	42.7	52.6	8.61	1.79
Daily (lb/day)	77.3	21.3	83.6	407	55.0	13.9
Annual (tons/yr)	2.36	2.30	3.24	50.3	5.85	0.67
Emissions Period (Units)	**Pollutant (off-site mobile sources)**					
	NO_x	VOC	CO	PM_{10}	$PM_{2.5}$	SO_x
Daily (lb/day)	22.4	1.66	6.64	2.40	1.39	0.03
Annual (tons/yr)	1.00	0.07	0.29	0.10	0.06	0.00

Source: AECOM 2010

Although new PM_{10} emissions are predicted during Project operation, the solar plant could potentially reduce overall PM_{10} emissions in this region. As noted in Chapter 3, the majority of dust in the Amargosa Valley is naturally occurring. However, by its nature, a solar energy project must keep dust to a minimum through the use of dust control measures, as a film of dust on the mirrors will reduce their efficiency for power production. Experience at other existing solar facilities has been that PM_{10} emissions from driving in the solar field are negligible. Dust control is achieved by a combination of watering, soil stabilizers, water from the mirror washing, and compaction of the driving surface over time. These control measures will be utilized by the proposed Project. Therefore, the emission estimates and impact analyses for PM_{10} and $PM_{2.5}$ should be considered very conservative (i.e., an over-estimate of emissions and corresponding impacts).

The proposed Project will be a minor source of criteria pollutant emissions from facility operation (e.g., emissions from auxiliary boilers and heaters, emergency generators, on-site maintenance traffic, etc.). However, controlled emissions sources would not exceed major source thresholds for any pollutant. Upon completion of final engineering design, the Proponent will consult with the NDEP – BAPC to obtain required air quality permits. The facility will require either a Class I Air Quality Operating Permit (if emissions from PM_{10}, NO_x, CO, SO_2, and VOC exceed 100 tons per year), or a Class II Air Quality Operating Permit, if emissions of these constituents are less than 100 tons per year.

4.1.2 Wet-Cooled Alternative

Impacts to air quality from construction and operation of a wet-cooled solar plant would be similar to the impacts described for the Proposed Action (dry-cooled alternative). The primary

difference is the additional PM_{10} and $PM_{2.5}$ emissions from the cooling tower associated with a wet-cooled plant due to solids in the entrained moisture in the cooling tower drift. Because wet-cooling towers provide direct contact between the cooling water and the air passing through the tower, some of the liquid water may be entrained in the air stream and carried out of the tower as "drift" droplets. PM_{10} is generated when the drift droplets evaporate and leave fine PM formed by precipitation/crystallization of dissolved solids. Dissolved solids found in cooling tower drift can consist of mineral matter, chemicals used in corrosion inhibition, etc. The assumptions made regarding cooling tower operation that are used as the basis of the emissions calculations for the wet-cooling alternative are as follows:

- Circulation rate of 149,000 gallons per minute
- Cooling tower blowdown will contain a maximum of 1,600 mg/L TDS assuming 15 cycles of concentration
- The cooling tower will be equipped with a drift eliminator with drift losses of less than or equal to 0.0005 per cent by weight based on the circulation flow rate
- The cooling tower run time will be a maximum of 24 hours per day at rated capacity and at a minimum load overnight for ancilliary equipment cooling, i.e., lube oil cooling. The total hours of operation at rated capacity would be 8,760 hours per year
- 100 percent of the TDS is PM_{10}/ $PM_{2.5}$ emissions

In contrast the auxiliary cooling tower for the dry-cooled alternative will use demineralized makeup water. The assumptions made regarding auxiliary cooling tower operation that are used as the basis of the emissions calculations for the dry-cooling alternative are as follows:

- One auxiliary cooling tower per power unit, a total of two cooling towers per project site
- Circulation rate of 6,034 gallons per minute
- Cooling tower blowdown will contain a maximum of 2,000 mg/L TDS
- The cooling tower will be equipped with a drift eliminator with drift losses of less than or equal to 0.0005 per cent by weight based on the circulation flow rate
- The cooling tower run time will be a maximum of 24 hours per day at rated capacity and at minimum load overnight for ancillary equipment cooling, i.e., lube oil cooling. The total hours of operations at rated capcity would be 8,720 hours per year
- 100 percent of the TDS is PM_{10}/ $PM_{2.5}$ emissions

Table 4-13 Comparison of Cooling Tower PM_{10} Emissions

	Dry-Cooled Alternative			Wet-Cooled Alternative		
Pollutant	**Hourly (lb/hr)**	**Daily (lb/day)**	**Annual (tpy)**	**Hourly (lb/hr)**	**Daily (lb/day)**	**Annual (tpy)**
PM_{10}	0.03	0.73	0.13	0.60	14.32	2.61
$PM_{2.5}$	0.03	0.73	0.13	0.60	14.32	2.61

4.1.3 No Action Alternative

Under the No Action Alternative, there would be no impacts from construction and operation of the proposed Project to air quality.

4.1.4 Mitigation

The Proponent will maintain compliance with laws and regulations concerning prevention and control of air pollution during construction and operation of the proposed Project, and will implement measures to minimize fugitive dust emissions from construction activities through the following activities:

1. Traffic on the project site will be restricted to designated roadways within the site to minimize the disturbance of soil unrelated to actual construction of solar troughs within the Project site.

2. Designated roadways that could be disturbed by vehicles or wind will be treated with an approved dust suppressant during both construction and operation. The approved suppressant will be one that has been applied previously on federally managed lands in the regional area.

3. Construction areas within the Project site that could be disturbed by wind will be treated with a BLM-approved dust suppressant during both construction and operation. The approved suppressant will be one that has been applied previously on federally managed lands in the regional area. The application of approved suppressants during the long-term operation of the proposed Project will be made based upon determination of a need for additional coverage from time to time.

Additional mitigation can be found in Appendix A. Following consultation with the NDEP on the final Project design, additional compliance measures may be required as part of their permit and approval process.

4.2 GEOLOGICAL HAZARDS AND MINERAL RESOURCES

This section describes and evaluates the impacts that geological hazards may have on the Proposed Action. This section also describes and evaluates the potential impacts on mineral resources that may result from the Proposed Action.

4.2.1 Proposed Action

4.2.1.1 Geological Hazards

The potential for earthquakes and ground subsidence in the Project area is low, but not non-existent. Ground-shaking as a result of earthquakes represents the most significant geological

hazard to the Project. Earthquakes have been recorded near the Project area and can be expected to occur in the future at essentially the same magnitude and frequency that have been previously recorded. Seismicity is a measure of the ground-shaking that is likely to occur in a given area as a result of earthquakes. The construction, operation, and maintenance of the proposed Project would not directly or indirectly impact earthquakes within the Project area or alter the seismicity in the vicinity of the Project area. While the Proposed Action would not affect earthquakes or seismicity in the Project area, earthquakes and the seismicity of the local area may potentially impact the proposed Project.

Quaternary faults have been mapped within the Project area (Slate et al. 1999). A fault crosses the southeastern portion of the Project area. A second fault crosses within 0.5-mile of the southwestern edge of the Project area. The construction, operation, and maintenance of the Proposed Action would not directly or indirectly impact Quaternary faults within the Project area.

Ground subsidence is the sinking or downward motion of the earth's surface resulting from either natural or manmade processes, such as mining, oil and gas extraction, or groundwater withdrawal (Bates and Jackson 1987). Local withdrawal of groundwater may result in ground subsidence by removing water from the pore spaces of consolidated sediments. As groundwater is removed, unoccupied pore spaces may collapse, thereby decreasing the total volume of the geological unit, which may cause the land surface to drop. Katzenstein and Bell (2005) observed 2.5 to 3.5 centimeters of ground subsidence in Amargosa Valley, which was in close proximity to areas of groundwater withdrawal.

The construction, operation, and maintenance of the proposed Project would not directly or indirectly impact ground subsidence within the Project area. The dry-cooling method as proposed will not increase the amount of groundwater being removed from the local area. As withdrawal of groundwater is the main cause of ground subsidence, it is unlikely that subsidence will continue to a degree that the facility will be damaged. Section 4.2.4 (Mitigation) lists subsidence as one of the geological factors that would be considered in the design and construction of the facility.

4.2.1.2 Unique Geological Resources

Unique geological resources will not be impacted by the proposed Project, because there are no known unique geological resources associated with the Project area. The nearest unique geological resource to the Project area is the Big Dune ACEC. However, because the Big Dune ACEC is approximately 4 miles from the Project area, and because there is no evidence of the Big Dune moving out of the ACEC, it is unlikely that the proposed Project will have any impacts to the Big Dune ACEC.

4.2.1.3 Mineral Resources

The primary impact issue for mineral resources is the loss of economically significant mineral resources. Two types of impact can potentially affect mineral resources:

1) Direct and permanent disturbance of the mineral-resource host rock during construction
2) Indirect and permanent disturbance due to changes in public accessibility to mineral resources

The primary cause of direct and permanent disturbance of mineral resources is ground disturbance associated with construction of the proposed Project, such as grading and cutting of roads and excavation for building foundations, which may damage or remove the geological units that host the mineral resources.

Given the absence of currently active mining or known mineral resources in the Project area, the potential impact to mineral resources is considered low. Nevertheless, indirect and permanent disturbance of mineral resources will be caused by the loss of mining-claim eligibility within the Project area. The mineral resource inventory found a single defunct placer mining claim within the Project area, which demonstrates past interest and the potential for future interest in placer-mineral resources within the Project area.

4.2.2 Wet-Cooled Alternative

Impacts to geological resources and mineral resources from construction and operation of a wet-cooled solar plant would be the same as to the impacts described for the Proposed Action (dry-cooled alternative).

4.2.3 No Action Alternative

Under the No Action Alternative, there would be no impacts from geological hazards or Project-related impacts to mineral resources.

4.2.4 Mitigation

Impacts from geological hazards or to mineral resources are expected to be minor. Site-specific geotechnical, seismic, and soil conditions will be appropriately addressed during the design and construction of the Project. In accordance with the National Electrical Safety Code, the Proponent would design and construct the Project facilities to withstand geological hazards by taking earthquake activity, seismicity, fault locations, and ground subsidence into consideration. Therefore, geological hazards in the Project area are expected to have a minimal impact on Project facilities.

4.3 SOILS

This section discusses the effects on soil resources that may occur with implementation of the Proposed Action or alternatives.

4.3.1 Proposed Action

Up to 4,350 acres of desert lands will be cleared and graded to accommodate construction of the solar facility and ancillary facilities. The removal of vegetation and soil crusts would expose soil and increase the potential for wind- and water-driven erosion. The runoff designations for the soils affected by Project construction and operation and maintenance, range from negligible (Arizo) to rapid (Yermo). Soils within the Project area exhibit rapid permeability, with the exception of the moderately permeable Sanwell series.

The soils within the Project area exhibit a moderate susceptibility for wind erosion. The dominant soil series within the Project area, the Yermo series, is assigned to a WEG of 5. The least extensive soil series within the Project area, the Lewdlac series, exhibits a moderate-high susceptibility to wind erosion and is assigned to a WEG of 3. Watering of active construction areas, such as grading of power blocks and cutting of roads, is expected to reduce susceptibility to wind erosion, consequentially reducing wind-blown, fugitive dust.

Grading activities will be conducted during the first 24 months of the construction schedule, and would be phased to minimize water needed for dust control. A small portion of the overall plant site would be paved, primarily the site access road, the service roads to the power blocks, and portions of the power block (paved parking lot and roads encircling the steam turbine generator and solar steam generator areas). The remaining portions of the power block would be gravel surfaced. The solar field would remain unpaved and without a gravel surface in order to prevent rock damage from mirror wash vehicle traffic. Water would be used for dust suppression on the dirt roadways within and around the solar field. Roads and parking areas located within the power block area and adjacent to the administration building and warehouse would be paved with asphalt.

Prior to construction, a Project-specific SWPPP will be developed that includes site-appropriate BMPs to reduce localized soil impacts from wind and water erosion. The site-appropriate BMPs may include stormwater BMPs; temporary erosion control measures, including BLM-approved dust suppression; and construction of berms and ditches, all of which will prevent accelerated soil erosion or dust generation. Following construction, permanent erosion and sediment control BMPs would include continued watering for dust control, use of diversion berms, and redirection of stormflows into a detention/sediment or settling basin prior to discharging stormwater off-site.

4.3.2 Wet-Cooled Alternative

Impacts to soil resources from construction and operation of a wet-cooled solar plant would be similar to the impacts described below for the Proposed Action (dry-cooled alternative).

4.3.3 No Action Alternative

Under the No Action Alternative, there would be no Project-related impacts to soil resources.

4.3.4 Mitigation

Site-specific mitigation measures would be required during construction of the proposed Project in order to avoid or minimize damage resulting from erosion, prevent acceleration of natural-erosion processes, increased sedimentation, and reduce the creation of fugitive dust that may affect both the Project and surrounding area. Temporary mitigation measures would be implemented during Project construction and then replaced with permanent measures upon completion of the proposed Project. Permanent mitigation measures would be maintained throughout the lifespan of the proposed Project. These mitigation measures are detailed in Appendix A.

4.4 WATER RESOURCES

This section discusses effects on water resources that may occur with implementation of the Proposed Action or alternatives. A numerical groundwater flow model was used to simulate existing pumping in the Amargosa Desert Hydrographic Basin and to evaluate the potential regional effects to water resources associated with construction and operation of the proposed Project. The following sections provide a summary of the groundwater modeling and predictive scenarios. The complete groundwater model report can be found in Appendix B.

4.4.1 Groundwater Model

4.4.1.1 Groundwater Model Background

Groundwater flow modeling was performed using the USGS DVRFS Model (Belcher 2004). During the preparation of this EIS, the DVRFS was the only numerical model available. The USGS is currently developing the Southern Amargosa Embedded Model (SAMM), a refinement of the DVRFS. The SAMM is a refinement to a portion of the DVRFS model which will enable improved modeling of the Amargosa Valley by utilizing a smaller model grid size. The higher resolution will facilitate more accurate simulation of groundwater flow and the effects of geologic structures more accurately than possible with the DVRFS. Funding for the SAMM, as well as the data used to construct the model, is derived from multiple sources,including the USGS, Nye County, USFWS, NPS, DOE and BLM. Once developed, the model will serve as a tool to simulate the potential effects of pumping groundwater in the Amargosa Desert Hydrographic Area under various scenarios (Nye County 2010). As part of water mitigation measures requested by the USFWS, the Proponent will contribute $6,000 annually, for the life of the Project, to the operation and maintenance of three monitoring wells associated with the Amargosa Monitoring Network. The Amargosa Monitoring Network is an integral component of the DVRFS and the SAMM.

For the analysis in this EIS, the DVRFS was calibrated to both pre-pumping and pumping conditions. The Amargosa Basin is one of the areas covered by the model in which there has been significant pumping; water-level changes measured in the area were used to guide calibration of the model.

The model was developed with MODFLOW-2000, using a grid with a lateral spacing of 1,500 meters, and a variable vertical spacing. There are 16 model layers, with an interpretation of the

water table used as a reference surface from which to base the elevation of the upper model layer. A large number of layers are needed to capture the geologic complexity incorporated into the geologic framework model, which is itself a simplification and interpretation of the actual geology. The model assumes that all layers are fully saturated and that dewatering does not occur. Thus, transmissivities do not become smaller with drawdown, and the model is approximately mathematically linear. Because the Drain package is used to simulate springs, the model would not be strictly linear if drawdown is sufficient to cause water levels in a cell to decrease below the specified elevation of a drain.

The model was calibrated using a non-linear regression technique which optimizes modeling parameters to minimize the objective function, which was in turn the sum of squared weighted residuals. A residual is defined as the difference between the observed (or estimated) value for a calibration target, and the corresponding simulated value. Hydraulic heads, water-level changes, discharge rates in spring areas, and lateral boundary fluxes were used as calibration targets. As the objective function represents the entire model, rather than concentrating on the Amargosa Farms and Ash Meadows areas, the agreement of simulated water-level change and measured change at Devils Hole is reasonable, but could be improved.

4.4.1.2 Groundwater Model Limitations

Before evaluating predictions of drawdown at Devils Hole or change in discharge at Ash Meadows using the DVRFS model, the reader needs to be aware of the limitations of using a regional-scale groundwater model to evaluate potential water resource impacts at springs or other sites (e.g., Devils Hole) that are local in scale (feet). These limitations include (1) model grid size (1,500 m x 1,500 m); (2) calibration to regional groundwater flow conditions; (3) estimates in historic pumping dataset; and (4) simplification of geology. The DVRFS model report states "the use of the [DVRFS] model to address regional-scale issues or questions is the most appropriate use of the model." Thus, using the DVRFS model to predict hydraulic heads or water-level change at Devils Hole is not an appropriate use of the model. However, the DVRFS model gives the reader a qualitative sense of how water levels change over time at a given location, and serves as an effective tool for evaluating impacts from the proposed Project on resources such as Devils Hole.

Before conducting predictive modeling simulations, it is important to compare calculations of water-level change at Devils Hole with measured changes. Provisional water-level data after 1989 was received from NPS. Several features should be noted:

- Both the measurement dataset and the simulated levels show declining water levels prior to the start of significant pumping in the Ash Meadows area. The simulated rate of decline is faster than the observed rate. The model is also slower to respond to changes in pumping rates.

- The effects of pumping in Ash Meadows are readily apparent in both the measurements and simulated results beginning in approximately 1970, but the simulated change is greater than the measured change.

- In the original 1998 model, during three periods beginning approximately in 1975, 1987, and 1998, there are simulated declines that do not occur in the measured values. The

model values do not recover as much as the measurements following cessation of nearby pumping. In the updated 2003 model, the simulated decline starting around 1975 still remains to a lesser degree, but the other two declines have been corrected. We suspect there is still an error in the historical pumping dataset prepared by the USGS for the 1975 period.

- The effects of seasonal barometric changes, seasonal pumping, and earthquakes are not incorporated in the model.
- Beginning in 1989, until 2003, the updated 2003 model simulates a decline in water levels.

In summary, the DVRFS model over-predicts the drawdown caused by historical local pumping by approximately 30 percent.

4.4.1.3 Groundwater Model Simulations and Assumptions

After updating the USGS DVRFS model through 2003 with the revised pumping and return flow dataset, groundwater modeling scenarios using this updated model were conducted. Based on discussions with the BLM and USFWS water resources team, the following modeling scenarios were simulated as part of this Project:

- Run existing DVRFS model an additional 200 years past the transient calibration period with 2003 pumping (i.e., existing pumping).
- Same as Scenario 1, except add the Proposed Action of groundwater withdrawal of 400 afy (600 afy during the 39 month construction period) from the proposed Project well south of the site from 2010-2039 (i.e., the approximate operation lifetime of the proposed Project).

The following assumptions were made during the modeling scenario simulations:

- No climatic effects – The current recharge dataset was used for the 200-year simulations. The effect of water rights users irrigating more or less due to climate than 2003 amounts was not estimated.
- The Project groundwater withdrawal of 400 afy for the 30 year operational period (600 afy during the 39 month construction period)was added to the 2003 pumping dataset.
- Water infiltration from mirror washing was not accounted for because it is assumed to not contribute to groundwater recharge.

4.4.1.4 Groundwater Model Results

The water-level contours indicate that the potentiometric surface of the valley fill has a broad and gently sloping gradient from the northeast toward the central axis of the valley and southwest toward the Funeral Mountains.

Within the Amargosa Basin, the most rapid water level declines occurred in the Amargosa Farms area, which is consistent with observed water level changes from other studies (Kilroy 1991). Devils Hole is approximately 15 miles from the proposed pumping, and the simulated drawdown at Devils Hole in 2003 from existing regional pumping is approximately 1.8 feet.

Scenario 1 (No Action) Results

For Scenario 1 (existing pumping), 2003 pumping and return flow was repeated every year for the next 200 years to determine the change in water levels at Devils Hole. Drawdown is predicted to be more than 5 feet over a large area. However, the drawdown is predicted to decrease rapidly in the Ash Meadows discharge area. The drawdown is buffered by the reduction in spring discharge that occurs with declines in water level. Simulated water levels at Devils Hole decline over 13 feet after 200 years, due to existing pumping. Note that "time zero" is assumed to be the simulated water-level elevation on December 31, 2003 from the model, not pre-development conditions.

Scenario 2 (Proposed Action) Results

For the Proposed Action, the 400 afy of groundwater withdrawal for the 30 year operational period was extracted from a single Project well. Pumping from this well is assumed to start in 2010 and concludes in 2039. The first 39 months (construction phase) of the Project will require 600 afy of groundwater instead of the lonf-term groundwater withdrawl of 400 afy. Table 4-14 shows the proposed groundwater withdrawal from the Project well.

Table 4-14 Proposed Groundwater Withdrawal from the Project Well

App. No.	Easting (m)	Northing (m)	Duty (afy)	Proposed w/d (afy)	Model Row	Model Column	Model Layer
15893	542362.42	4044948.68	603	400	116	71	1

The model results from the Proposed Action scenario show that simulated water levels at Devils Hole decrease by approximately 0.05 of a foot or 0.6 of an inch after 200 years. It is important to keep in mind that this reduction in water levels may be over-predicted, based on the historical over-prediction of water level declines at Devils Hole. The DVRFS model calibration to hydraulic head change is also not accurate to 0.05 feet. The DVRFS model report considers the model fit to hydraulic heads to be good if the difference between simulated and observed hydraulic heads is less than 10 meters (Belcher 2004).

The DVRFS model is also not designed to exactly measure drawdown at a spring location several miles away, such as Devils Hole, because of its (1) grid size [1,500 meters x 1,500 meters]; (2) emphasis on calibration to regional groundwater conditions; (3) estimates in historic pumping dataset; and (4) simplification of geology. Thus, the regional model has a limited capability to accurately evaluate incremental changes in pumping tens of miles away on Devils Hole; however, it is the only groundwater flow model currently available.

Ash Meadows Discharge

The USGS code ZONEBUDGET was used to evaluate the changes in water movement for the Amargosa Basin. Under the present-day pumping rates, the model predicts that only minor changes to the discharge rate at Ash Meadows would have occurred by 2003, the end of the model calibration period. When the present-day pumping is continued into the future, the model predicts that impacts to the discharge will occur. In 2203, the discharge is predicted to be reduced from approximately 18,095 afy to 15,607 afy. When the Project pumping is added, the discharge rate in 2203 is predicted to be reduced to only 15,600 afy or a difference of 7.4 afy or 0.05 percent.

4.4.1.5 Groundwater Model Summary

Comparison of simulated and observed changes in water levels at Devils Hole through 2003 indicated that the model overestimated the change in water level caused by pumping in Amargosa Basin. There may be an error in the historical pumping dataset that affects this comparison. Although the model could be improved by additional work, specifically in the Amargosa Desert and Ash Meadows areas, the pumping estimates developed for the model are reasonable.

The simulations predict that pumping from the Project well will cause water levels in Devils Hole to decline approximately 0.05 feet after 200 years. Again, when considering this prediction, it is important to recognize that the model cannot accurately predict hydraulic heads or water-level changes at Devils Hole due to its original objective of modeling groundwater flow at a regional scale. The results of these simulations should be regarded as a qualitative assessment of how hydraulic heads may change over time with a given set of circumstances and assumptions.

The model predicts that the Project pumping will reduce the discharge rate from springs at Ash Meadows an amount of 7.4 afy or 0.05 percent.

Groundwater pumping in the Amargosa Farms area has caused tens of feet of drawdown near the pumping wells. Simple modeling using the Theis equation and superposition, coupled with regression procedures, indicates that the pumping in the Amargosa Farm area is the primary cause of the present-day drawdown at Devils Hole

4.4.2 Proposed Action – Dry Cooled Alternative

Under this alternative, the Proponent would construct, operate, maintain, and ultimately decommission two 250-MW dry-cooled solar power plants equipped with thermal energy storage capability and associated facilities on lands managed by the BLM. Overall, the footprint of the proposed Project and related facilities will result in permanent disturbance of approximately 4,350 acres.

4.4.2.1 Impacts from Construction

As described in Chapter 2, Proposed Action and Alternatives, the proposed Project would require up to 600 afy, or 1,950 acre-feet of groundwater over the 39-month construction period. Water from groundwater during construction will be used for:

- Dust suppression during grading and along roadways as necessary
- Grading and compaction for the solar field and power block areas, infrastructure, and building foundations
- Concrete work and other uses

Water Rights and Use

The water right of the well to be used during construction and operations has an annual duty of 603 acre-feet and is currently permitted for agricultural use. Over the last 25 years (1983–2008), the average annual duty used by the water rights holder has been 413.88 afy. In this average, 1984 was not included as no pumping data is available for that year. The Proponent has filed an application (No. 79699) with the Nevada State Engineer's Office to change the place and manner of use of the water right. The Proponent has requested that 400 acre-feet of the 603 acre-feet annual duty be changed from agricultural to industrial use.

Following approval of a second application (No. 79783) by the Nevada State Engineer, the Proponent intends to drill a new well approximately 300 feet west of the existing well, and move 400 acre-feet from its current point of diversion to the new well. The remaining 203 acre-feet will remain with the existing well. This will allow for redundancy should one of the wells fail. During construction, the Proponent will lease the full annual duty (603 afy) from the water rights holder for the Project well. During this period, the water rights holder will fallow farmlands that were previously irrigated. After construction, the water rights holder may continue to irrigate up to 40 acres of farmland with the 203 acre-feet assigned to the existing well.

The water to be used during construction will be piped from the Project well to temporary water storage tanks to be located throughout the construction site. Meters will be placed on both wells to ensure there is no exceedance of the permissible annual duty.

Water Quality

Potential impacts to water resources during construction would be primarily associated with surface disturbing activities, but could also be a result of accidental spills and handling and storage of hazardous chemicals. These chemicals can potentially contaminate surface waters during heavy storm events, or groundwater through infiltration. A number of mitigation measures are proposed to prevent spills of chemicals, as well as to respond to spills should they occur. The site-specific SWPPP will include stormwater BMPs, and temporary erosion control measures including BLM-approved dust suppression, and construction of berms and ditches, all which will prevent accelerated soil erosion or dust generation. Adhering to proper material handling procedures and complying with the SWPPP would ensure that construction-related water quality impacts would not occur.

AMENDED APPLICATION CONTINUED

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Surface Water

The proposed solar field improvements will change the historic drainage patterns of the Fortymile Wash within the boundaries of the Project site. The Proponent performed hydrologic and hydraulic modeling to assess existing site drainage and develop a Conceptual Stormwater Control Plan (Slater Hanifin Group 2009). The plan was designed to quantify and accommodate a 100-year flood flow event in the Fortymile Wash.

As described in Chapter 2.3.13, Site Drainage and Earthwork, flood protection of the property from off-site flows will be provided by means of a continuous channel around the northern and western perimeter of the site. The channel will be designed to effectively intercept the 100-year storm event off-site runoff and convey the concentrated flow to one of the historic discharge locations of the Fortymile Wash in the southwest corner of the property. The channel will discharge within the property limits and energy dissipation facilities will disperse the concentrated flow back to a shallow sheet flow condition before the flow leaves the property boundary. Additionally, a channel is proposed along the eastern side of the solar field in order to intercept and collect flows impacting the site from the east. Similar to the northern and western perimeter channels, the concentrated flow will be released on property in its historic location and an energy dissipation facility will return the flow to a shallow sheet flow condition before it leaves the property. Perimeter channels will be concrete lined due to the high velocity potential and for maintenance reasons. Off-site flows will be intercepted and conveyed around the site to ensure no direct contact with on-site stormwater runoff.

Due to the size of the solar field area, the site itself has potential to generate large storm flows during a rain event. For this reason, stormwater control facilities are necessary to protect on-site facilities, and to convey stormwater runoff to historic discharge locations in both quantity and manner of flow. The four primary (major) onsite channels, traversing the site north to south, will provide 100-year event stormwater runoff interception from four equal divisions of the entire Project site. The two power block areas would contain the most sensitive equipment on the site and therefore would each be located along one of the primary channels; The design would achieve flood protection during a 100-year storm event. The stormwater runoff generated between the primary channels will be collected in a series of swales and small channels that will direct the flow to the appropriate primary channel. All minor channels within each section will be designed to intercept and convey the 25-year storm event. Stormwater runoff in areas between the primary channels and in excess of the 25-year event will sheet flow (shallow depth, low velocity) below the solar panel systems. This flow would eventually be intercepted by an appropriate primary channel before the flow impacted a power block area. This concept was selected in order to reduce costs for on-site drainage facilities, while still providing desired flood protection.

The USACE has indicated that it may assert jurisdiction over certain drainages that traverse the Project site. A complete assessment of the potential effects to jurisdictional waters from Project construction and operation will be completed once the USACE issues a Jurisdictional Determination. That document will identify all jurisdictional waters, including ephemeral waters; describe the Project's impacts on those waters; and prescribe appropriate mitigation measures.

Groundwater

The existing well was drilled in 1960 to a total depth of 330 feet. Table 4-15 lists wells within 1-mile of the existing well.

Table 4-15 Wells Within 1-Mile of the Proposed Project Well

Well Log No.	Date Completed	Total Depth (feet)	Static Water Level (feet)	Type of Use	Perforation (feet)
107413	06/09/2008	240	137	Domestic	140-220
43503	10/22/1993	260	135	Domestic	180-250
105038	03/06/2008	240	138	Domestic	140-230
4113	04/28/1958	250	110	Irrigation	N/A
2852	02/24/1955 (deepened in 1962)	140 / 349	100 / 110	Irrigation	146-349
43672	11/14/1993	260	95	Domestic	160-260
7212	05/18/1963	300	112	Irrigation	150-300
4379	11/26/1958	240	92	Irrigation	100-240
2868	01/12/1955	421	N/A	Irrigation	140-421
86706	04/30/2002	600	118	Irrigation	80-600
3351	03/05/1956	480	N/A	Irrigation	N/A
52318	01/31/1966	161	96	Domestic	134-161
99031	03/01/2006	222	135	Domestic	126-186
24932	09/05/1983	404	118	Irrigation	120-404
6122	08/25/1961	503	60	Irrigation	270-503
6123	08/10/1961	510	62	Irrigation	170-485
20045	01/18/1979	497	0	Irrigation	216-497
78018	04/12/1999	230	97	Domestic	150-203
52317	N/A	500	0	Irrigation	N/A
5120	03/23/1960	330	94	Irrigation	100-330
5606	04/05/1960	330	84	Irrigation	80-330
5621	04/21/1960	300	83	Irrigation	90-300

Source: NDWR 2010c

There are currently seven domestic wells within 1 mile of the proposed Project well. Average depth of these wells is approximately 134 feet, with an average static water level of 70 feet. The majority of domestic wells were drilled in the 1990's. As described in Chapter 3.4, since a domestic well is not required to obtain a water right permit for use, it is unknown how many of these wells are being actively used.

There are 15 wells within 1 mile that were drilled for agricultural use. In reviewing the Nevada State Engineers water rights database, only six of these have an associated water right, one of which includes the proposed Project well (Well Log No. 5120/Certificate No. 5717). The majority of irrigation wells were drilled pre-1970s, to an average depth of 400 feet. The average static water level for wells used for irrigation is approximately 87 feet.

4.4.2.2 Impacts from Operations

Once construction is complete, the Proponent will continue to lease 400 afy from the water rights holder and will relinquish back to the holder the remaining 203 afy. The water rights holder may continue to irrigate up to 40 acres of farmland with the 203 acre-feet assigned to the existing well. The Proponent will lease 400 afy for the remainder of the life of the Project. This may result in an increase in pumping in the basin, as the full duty of the right has not been exercised on an annual basis over the past 25 years. To offset the impacts associated with this potential increased pumping, as well as the loss of recharge that may result from the change in manner of use of the water right from irrigation to industrial, the Proponent, per the stipulated agreement with NPS, USFWS and BLM, must acquire no less than 236 afy of senior groundwater rights in the vicinity of the Project well or closer to Devils Hole and Ash Meadows NWR. The acquired water rights will preferably be historically fully utilized. If fully-utilized rights totaling 236 afy are unavailable for purchase, sufficient rights must be purchased such that the cumulative total of their historic pumping average is no less than 236 afy.

Water Use

Estimated water uses for the proposed dry-cooled Project will be used for the following consumptive uses:

- Solar mirror wash water to maintain solar collector efficiency
- Power cycle makeup water to supply the steam driving the steam turbine generators
- Equipment heat rejection for cooling generators, pumps, and other equipment
- Dust suppression
- Domestic potable uses include drinking water, showering, toilets, hand washing, etc.

Estimates for operational water usage are listed in Table 2-4, and are based on:

- Power cycle makeup water and auxiliary equipment heat rejection – expected monthly power production rates
- Solar mirror washing – experience at other locations with similar climatic conditions

- Domestic potable use – number of employees and number of hours expected to be worked during the year; an average consumption of 37 gallons per person per day was assumed
- Dust suppression – The RO discharge water will be used for dust suppression on an as needed basis

Water Quality

Operation of the proposed Project has the potential to impact water quality through improper storage and use of materials and from soil erosion. Adhering to proper material storage and handling procedures and complying with the operation SWPPP will result in minor to no impacts to water quality. The SWPPP will identify BMPs to manage pollutant releases, including spill and leak prevention, waste handling, employee training, and erosion and sedimentation controls. Through compliance with the General Industrial Permit, all potential pollutants generated during the industrial phase will be sufficiently mitigated such that water quality standards will not be violated. Thus, surface water and groundwater quality impacts during the operations phase would be minor and not significant.

The Project will produce one primary wastewater stream: sanitary wastewater. Sanitary wastes will be collected from the power blocks, administration building, and warehouse for treatment in several septic tanks. Septic tanks are the most common method of on-site wastewater treatment and disposal. Liquid effluent from the septic tanks will have biological oxygen demand of approximately 175 mg/L and suspended solids concentration of approximately 75 mg/L. Heavy solids will settle to the bottom of the septic tank, undergo anaerobic decomposition and slight compaction, and will be removed and properly disposed of every 3 to 5 years.

Liquid effluent from the septic tanks will be distributed to multiple leach fields (in close proximity to the septic tanks). Based on the current estimated average of 185 employees on a 24-hour, 7 day per week work schedule, a total leach field of approximately 16,500 square feet will be required. It is expected that the leach fields will satisfy the needs of the plant for its entire service life. At this time, the leach field is anticipated to be sited adjacent to the bioremediation field. However, the final location will be determined following additional engineering design. The Proponent will coordinate the development of the leach field and bioremediation facility with NDEP as part of their permitting and approval process with that agency.

There are no processes or operational wastewaters that will be connected to the septic system and leach field. The use of a septic system and associated leach field is a well established process and acceptable method of treatment and disposal when there is no local sewer system available, when the local soil and groundwater conditions are acceptable to this method, and when the chemical makeup of the wastewater is not a hazard to the local environment. The local soils are very permeable and the depth to groundwater in this area is approximately 135 feet below ground surface. At this depth, the soil overlying a leach field is generally considered sufficient for the biological treatment of domestic wastewater.

The power cycle makeup water will be recycled back into the process at rates between 34,500 and 52,500 gallons per day for each power block. Other water streams like plant drains and other miscellaneous water waste streams are collected and recycled back into the process.

4.4.3 Wet-Cooled Alternative

Under the wet-cooled alternative, the demand for water would be 4,600 afy, which is substantially more than that required for the Proposed Action (dry-cooled alternative). Under the wet-cooled alternative, the Proponent would either lease or purchase existing certified water rights for water needs during construction and operation of the proposed Project. Water rights would be acquired from existing water right owner(s), as no new appropriations are granted by NDWR due to Nevada State Engineer Order 1197. Since it is unknown where water rights would ultimately be obtained for a wet-cooled project, the groundwater flow model simulations and hydrologic analysis were not performed. Nevertheless, it is virtually certain that the potential impact to water resources, particularly groundwater availability, would be substantially greater than with the dry-cooled alternative. These different impacts would result from the more than ten-fold increase in the quantity of extracted water, as well as from the change in the manner of use from agriculture to industrial.

Whereas the dry-cooled alternative is estimated to result in a recharge loss of 32 afy (that is, recharge that occurs through using water for irrigation versus industrial use), the wet-cooled alternative could increase that loss by an order of magnitude of several thousand acre-feet. The amount of recharge would be based upon current agricultural practices, depth to water, and average water application rates.

Construction-related impacts on surface and groundwater resources for this alternative would be the same as the Proposed Action (dry-cooled alternative). Plant components and layout are similar under both the wet- and dry-cooled alternatives, the primary difference being the amount of water used for plant operations, the need for cooling towers for heat rejection from the steam cycle, and the size and number of evaporation ponds. Impacts to surface and groundwater quality and jurisdictional waters would be similar to the Proposed Action.

4.4.4 No Action Alternative

Under the No Action alternative, the proposed Project would not be constructed, and there would be no effects of construction and operation of the proposed Project on local or regional water resources. However, groundwater would continue to be pumped in the Amargosa Desert Hydrographic Basin and DVRFS with unknown impacts to sensitive water resources area, including Devils Hole and springs and seeps in the Ash Meadows NWR. In addition, the Proponent would not contribute $6,000 annually, for the life of the Project, to the operation and maintenance of the Amargosa Monitoring Network.

4.4.5 Mitigation

Prior to beginning any clearing, grading, or excavation activities associated with construction of the Project, the Project owner will develop and implement an site-specific construction-phase SWPPP as required under the General Storm Water Construction Activity Permit, as well as implement any other Project-specific mitigation measures required by other agencies (e.g., NDEP, Nye County, USACE). The Project owner will obtain and comply with permits for construction of Project-specific water pipelines or septic system prior to construction of the plant.

Prior to commercial operation, the Project owner, as required under the General Industrial Activity Stormwater Permit, will develop and implement a site-specific operations phase SWPPP.

To address potential effects to sensitive species at Ash Meadows NWR and Devils Hole, the Proponent will acquire no less than 236 afy of additional existing water rights (Minimization Water Rights) from within the Amargosa Desert Hydrographic Basin. A copy of the stipulation requirements are provided in Appendix A.

In addition, the Proponent will contribute $6,000 annually, for the life of the Project, to the operation and maintenance of the Amargosa Monitoring Network. The $6,000 is the estimated cost of operating three monitoring wells for one year.

4.5 NOISE

To determine potential noise impacts of the proposed Project during the construction and daily operations of the facility, a detailed noise model was constructed to evaluate all aspects of significant noise sources on the surrounding residential community. Modeling of the Project site and surrounding environment was accomplished using Cadna (Computer Aided Noise Abatement) Version 3.7, which is a model-based computer program developed for predicting noise impacts in a wide variety of conditions. Cadna allows for the input of Project information such as noise source data, barriers, structures, and topography to create a detailed CAD (Computer Aided Design) model, and uses the most up-to-date calculation standards to predict outdoor noise impacts to property lines and adjacent surrounding areas.

The potential significance of impacts are defined by comparing the Project-related noise levels at the adjacent residential land use areas to the EPA outdoor noise guidelines of 55 dBA Ldn. If Project-related noise impacts to the adjacent residential property lines exceed the 55 dBA Ldn noise guidelines established by the EPA, then mitigation is required.

Also, noise impacts to defined outdoor work environments located within the Project site from potential noise sources, such as the power block areas, is defined by the federal OHSA hearing conservation noise exposure regulation. The regulation states that the acceptable OSHA 8-hour Time Weighted Average (TWA) noise threshold limit must not exceed 90 dBA. If an employee or service contractor is shown to be exposed to a noise level of 90 dBA for a continuous 8-hour period, then it shall be necessary to develop and implement a hearing conservation plan to protect the worker during the noise impact condition, thus, satisfying the OSHA requirement.

4.5.1 Proposed Action

4.5.1.1 Construction Noise Impacts

Throughout the construction of the proposed Project, noise impacts from the operation of construction machinery are expected. The temporary construction noise evaluation assesses the anticipated construction noise impacts to the defined property line sensitive receptor locations, and is compared to the EPA outdoor guidelines of 55 dBA Ldn.

The construction noise impact analysis is based on a phased construction schedule for the proposed Project that incorporates a total of three distinct construction phases. The following analysis evaluates the three construction phase scenarios and is based upon the noise emission data from the equipment manufacturer and expected operational utilization within each phase.

The noise impact calculations assume worst-case conditions with all equipment running simultaneously. All sound pressure levels within the equipment noise emission database are standardized at a distance of 50 feet from the noise source. The noise evaluation for each phase is based on the construction equipment operating during a 12-hour time period between 7:00 a.m. and 7:00 p.m. The noise generated from the equipment operating during the daytime 12-hour time period is then incorporated into the 24-hour Ldn calculation to determine worst-case construction noise impacts to the sensitive receptor locations. The equipment percent operating use is based on typical land use development construction practices and our professional experience. The noise calculations of each phase will provide a realistic prediction of the noise impact range to be expected from typically intermittent construction equipment operations.

Phase 1 - Project Site Grading

The proposed construction equipment to be used in the Project site grading phase is summarized in Table 4-16.

Table 4-16 Project Site Grading Phase Construction Equipment and Sound Pressure Levels

Equipment	Quantity	Operation Usage Percentage for 12 Hours	Sound Pressure Level at 50 feet (dBA)
Generator	2	66%	82.0
Back Hoe	2	66%	80.0
Loader	2	66%	80.0
Dump Truck	2	66%	84.0
Excavator	1	66%	85.0
Water Truck	1	66%	84.0
Bull Dozer	2	66%	85.0

The noise impacts from the Project site grading construction activities were evaluated at five worst-case sensitive receiver locations, placed within and along the Project property lines. The worst-case noise impact calculations from the Project site grading construction activities to the sensitive receivers are summarized in Table 4-17.

Table 4-17 Project Site Grading Phase Temporary Construction Noise Impacts

Receiver	Location	Construction Noise Impacts (dBA Ldn)
1	Eastern Power Block	70.8
2	Northern Property Line	57.1
3	Eastern Property Line	53.2
4	Southern Property Line	49.9
5	Western Property Line	53.1

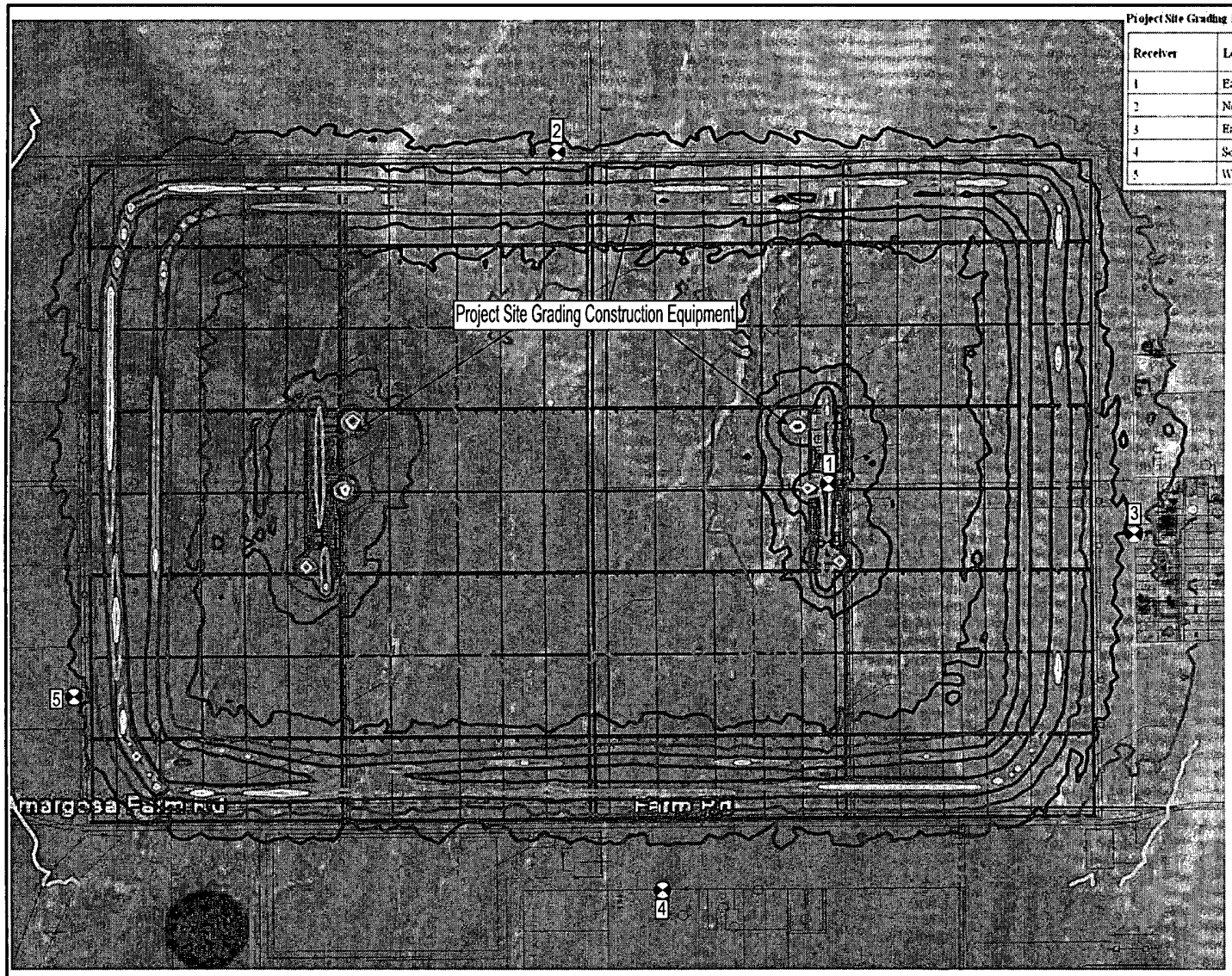
The EPA provides a guideline for outdoor noise impacts to residential property lines of 55 dBA Ldn. The calculations show that the worst-case construction noise levels at the property lines range from 49.9 dBA Ldn at the southern property line to 57.1 dBA Ldn at the northern property line. There are no sensitive noise receptors located along the northern property line; therefore, these noise impacts are considered to be minor and no mitigation will be required for the Project site temporary grading operations. A graphical representation of the noise impacts from the Project site temporary grading activities phase are presented on Figure 4-1.

Phase 2 - Roadway Access Paving and Project Structural Foundation

The proposed construction equipment to be used for the Project related roadway access paving and structural foundation phase is summarized in Table 4-18.

Table 4-18 Roadway Access Paving and Project Structural Foundation Phase Construction Equipment and Sound Pressure Levels

Equipment	Quantity	Operation Usage Percentage for 12 Hours	Sound Pressure Level at 50 feet (dBA)
Generator	2	66%	82.0
Compactor	2	66%	80.0
Concrete Truck	2	66%	85.0
Concrete Pump	2	66%	82.0
Asphalt Paver	2	66%	85.0
Roller	2	66%	85.0
Vibratory Roller	2	66%	85.0
Grader	2	66%	85.0



Project Site Grading Phase Temporary Construction Noise Impacts

Receiver	Location	Construction Noise Impacts (dBA Ldn)
1	Eastern Powerblock	70.8
2	Northern Property Line	57.1
3	Eastern Property Line	53.2
4	Southern Property Line	49.9
5	Western Property Line	53.1

- 40 dBA Ldn
- 45 dBA Ldn
- 50 dBA Ldn
- 55 dBA Ldn
- 60 dBA Ldn
- 65 dBA Ldn
- 70 dBA Ldn
- 75 dBA Ldn
- 80 dBA Ldn
- 85 dBA Ldn
- 90 dBA Ldn

Amargosa Farm Road Solar Energy Project
Amargosa Valley, Nevada

Aerial Image Showing Noise Impact Contours from Project Site Grading Phase Construction Operations

ARCADIS

FIGURE
4-1

The noise impacts from the roadway access paving and Project structural foundation construction activities were evaluated at five worst-case sensitive receiver locations placed within and along the Project property lines. The worst-case noise impact calculations from the roadway access paving and Project structural foundation construction activities to the sensitive receivers are summarized in Table 4-19.

Table 4-19 Roadway Access Paving and Project Structural Foundation Phase Temporary Construction Noise Impacts

Receiver	Location	Construction Noise Impacts (dBA Ldn)
1	Eastern Power Block	65.5
2	Northern Property Line	54.3
3	Eastern Property Line	40.2
4	Southern Property Line	55.0
5	Western Property Line	48.3

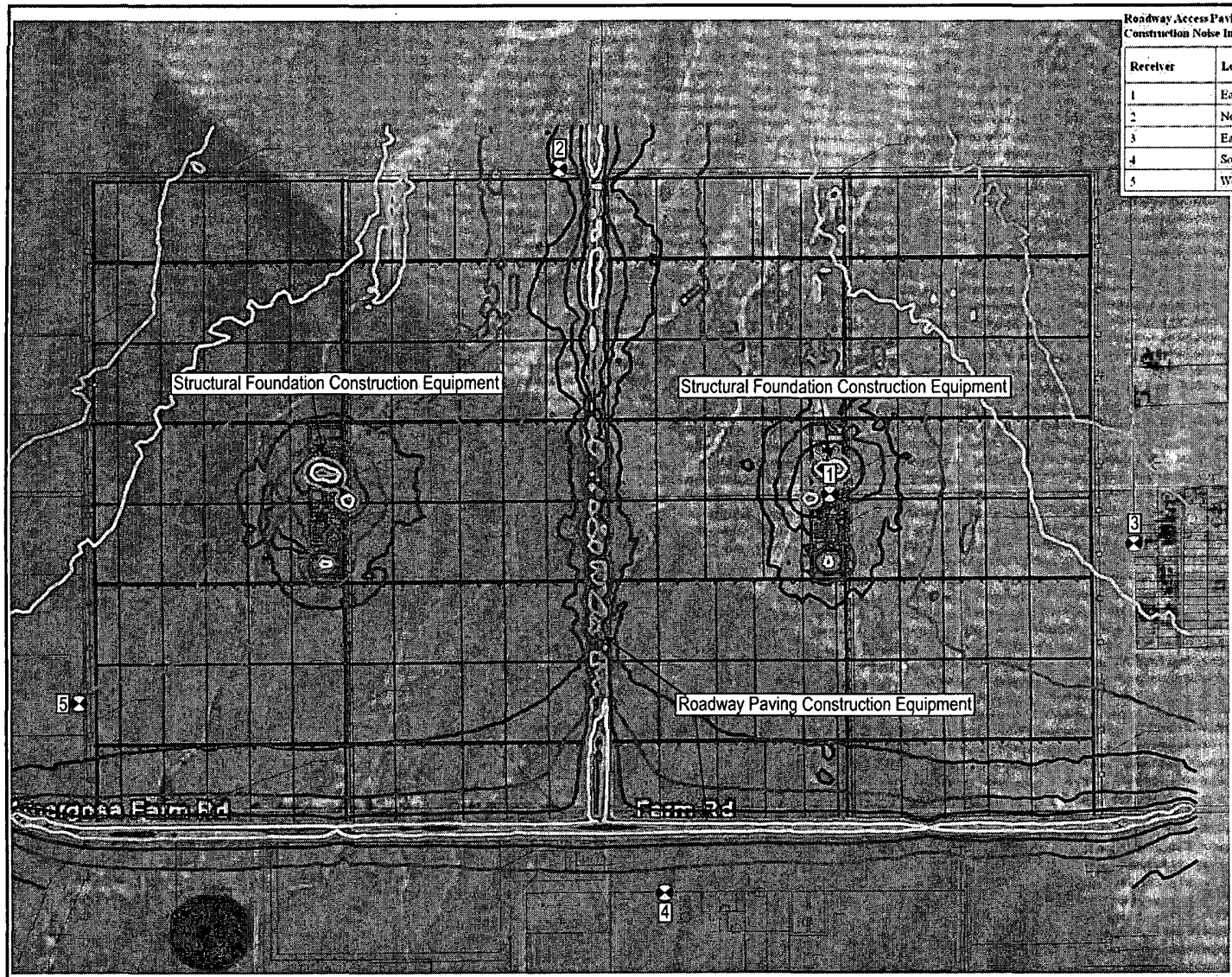
The EPA provides a guideline for outdoor noise impacts to residential property lines of 55 dBA Ldn. The calculations show that the worst-case construction noise levels at the property lines range from 40.2 dBA Ldn at the eastern property line to 55.0 dBA Ldn at the southern property line. These noise impacts are considered to be minor and no mitigation will be required for the roadway access paving and Project structural foundation temporary construction operations. A graphical representation of the noise impacts from the Project site grading phase construction activities are presented in Figure 4-2.

Phase 3 - Project Mechanical Equipment Installation

The proposed construction equipment to be used in the Project mechanical equipment phase is summarized in Table 4-20.

Table 4-20 Project Mechanical Equipment Installation Phase Construction Equipment and Sound Pressure Levels

Equipment	Quantity	Operation Usage Percentage for 12 Hours	Sound Pressure Level at 50 feet (dBA)
Generator	2	66%	82.0
Crane	4	66%	85.0
Forklift	4	66%	85.0



Roadway Access Paving and Project Structural Foundation Phase Temporary Construction Noise Impacts

Receiver	Location	Construction Noise Impacts (dBA Ldn)
1	Eastern Powerblock	65.5
2	Northern Property Line	54.3
3	Eastern Property Line	40.2
4	Southern Property Line	55.0
5	Western Property Line	48.3

40 dBA Ldn
45 dBA Ldn
50 dBA Ldn
55 dBA Ldn
60 dBA Ldn
65 dBA Ldn
70 dBA Ldn
75 dBA Ldn
80 dBA Ldn
85 dBA Ldn
90 dBA Ldn

Amargosa Farm Road Solar Energy Project
Amargosa Valley, Nevada

Aerial Image Showing Noise Impact Contours from the Roadway Access Paving and Project Structural Foundation Phase Construction Operations

ARCADIS

FIGURE
4-2

The noise impacts from the Project mechanical equipment installation construction activities were evaluated at five worst-case sensitive receiver locations placed within and along the Project property lines. The worst-case noise impact calculations from the Project mechanical equipment installation construction activities to the sensitive receivers are summarized in Table 4-21.

Table 4-21 Project Mechanical Equipment Installation Phase Temporary Construction Noise Impacts

Receiver	Location	Construction Noise Impacts (dBA Ldn)
1	Eastern Power Block	65.8
2	Northern Property Line	35.3
3	Eastern Property Line	38.7
4	Southern Property Line	31.7
5	Western Property Line	38.0

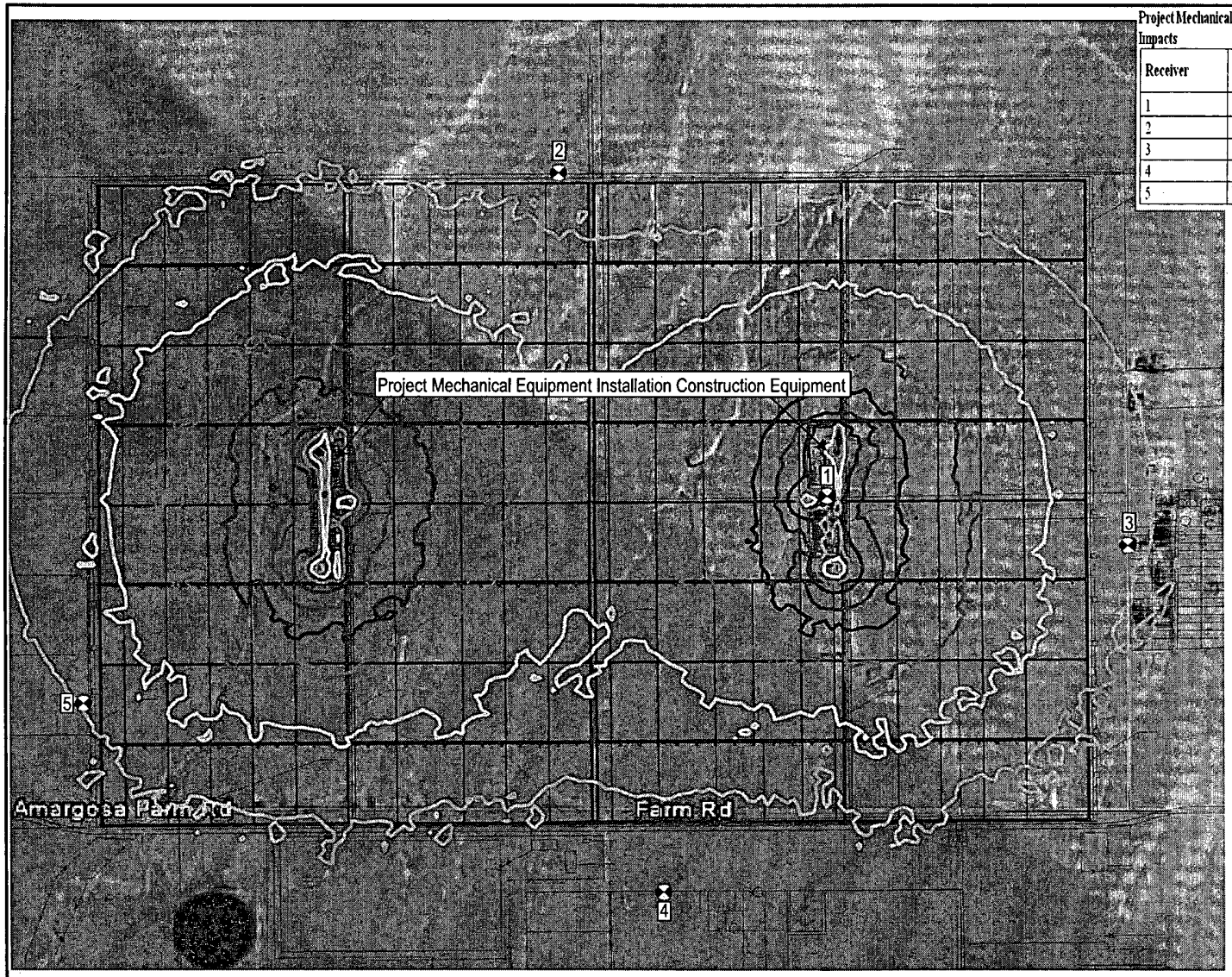
The EPA provides a guideline for outdoor noise impacts to residential property lines of 55 dBA Ldn. The calculations show that the worst-case construction noise levels at the property lines range from 31.7 dBA Ldn at the southern property line to 38.7 dBA Ldn at the eastern property line. These noise impacts are considered to be minor and no mitigation will be required for the Project mechanical equipment installation temporary construction operations. A graphical representation of the noise impacts from the Project site grading phase construction activities are presented in Figure 4-3.

4.5.1.2 Operational Noise Impacts

The operational activities of the proposed Project were evaluated to determine the worst-case daily operational noise impacts to the defined sensitive receptors. This evaluation will determine if the daily operational noise impacts will exceed the EPA guidelines.

The proposed Project would operate continuously for 24 hours a day, 7 days a week. However, power generation noise would occur primarily during daytime hours, when the sun's energy is utilized in the power-generating process. The primary noise sources of a typical solar thermal power plant are centered around the power block area, where the steam turbine generator, air cooled condensor, and other noise generating pump equipment are located.

Operation of the Project would generate an increase in vehicular traffic on local roads and area highways in the vicinity of the Project site. According to the Palen Noise Impact Report, dated August 2009, it is shown that an estimated 536 average daily traffic trip volume would be generated by the employees needed for the service and operation of the proposed Project. Employee and service vehicle access to the Project site would use US 95, then Valley View Boulevard to access the Project site via Amargosa Farm Road. Table 4-22 summarizes the proposed equipment and associated noise emission levels.



Project Mechanical Equipment Installation Phase Temporary Construction Noise Impacts

Receiver	Location	Construction Noise Impacts (dBA Ldn)
1	Eastern Powerblock	65.8
2	Northern Property Line	35.3
3	Eastern Property Line	38.7
4	Southern Property Line	31.7
5	Western Property Line	38.0

40 dBA Ldn
45 dBA Ldn
50 dBA Ldn
55 dBA Ldn
60 dBA Ldn
65 dBA Ldn
70 dBA Ldn
75 dBA Ldn
80 dBA Ldn
85 dBA Ldn
90 dBA Ldn

Amargosa Farm Road Solar Energy Project
Amargosa Valley, Nevada

Aerial Image Showing Noise Impact Contours from the Project Mechanical Equipment Installation Phase Construction Operations

ARCADIS

FIGURE
4-3

Table 4-22 Summary of Equipment Noise Levels						
Quantity	**Equipment Description**	**Manufacturer**	**Daytime Occurrences**	**Nighttime Occurrences**	**Sound Level Distance (meter)**	**Noise Level (dBA)**
4	Demineralized Water Pump	N/A	100%	25%	1	92.0
4	Fire Protection Pump	N/A	100%	25%	1	92.0
8	Service Water Pump	N/A	100%	25%	1	92.0
6	Condensate Pump	N/A	100%	25%	1	92.0
4	Cooling Tower	N/A	100%	25%	1	85.0
4	Auxiliary Cooling Water Pump	N/A	100%	25%	1	92.0
4	Closed Cooling Water Pump	N/A	100%	25%	1	92.0
2	Emergency Diesel Generator	N/A	100%	25%	1	85.0
2	Generator	N/A	100%	25%	1	85.0
2	Generator Setup Transformer	N/A	100%	25%	1	108.0
2	Feedwater Pump	N/A	100%	25%	1	92.0
4	Freezer Protection Pump	N/A	100%	25%	1	92.0
20	HTF Pump	N/A	100%	25%	1	92.3
6	Overflow Return Pump	N/A	100%	25%	1	92.0
2	Air Cooled Condenser	N/A	100%	25%	1	122.0
2	Auxiliary Boiler	N/A	100%	25%	1	102.0
8	Steam Generator	N/A	100%	25%	1	85.0
2	Steam Turbine	N/A	100%	25%	1	85.0

The combined mechanical equipment noise impacts from the proposed solar energy Project were evaluated at five strategically placed worst-case receivers located within and along the Project property lines. Table 4-23 shows the calculated operational mechanical noise impacts at these five worst-case receiver locations.

Table 4-23 Noise Impacts to the Surrounding Area from the Project Operations		
Receiver	**Location**	**Operational Noise Impacts (dBA Ldn)**
1	Eastern Power Block	80.5
2	Northern Property Line	39.1
3	Eastern Property Line	54.7
4	Southern Property Line	50.0
5	Western Property Line	54.7

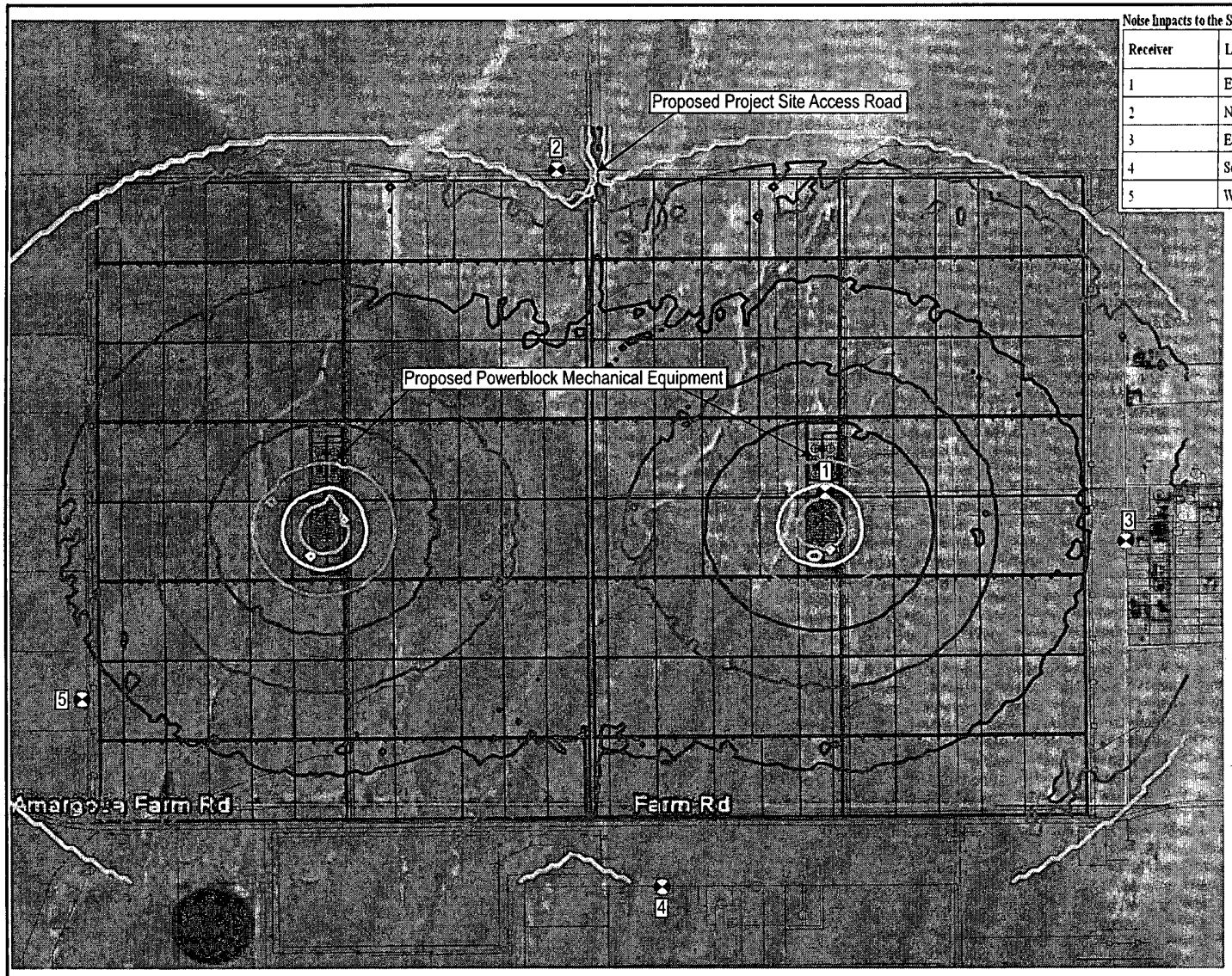
Calculations show that the noise impacts from the solar facility's daily operations would range from 39.1 dBA Ldn at the northern property line to 54.7 dBA Ldn at the eastern property line. The noise impacts associated with the Project's operational activities are shown to be minor and no mitigation will be required. A graphical representation of the noise impacts from the Project's combined daily operations are presented on Figure 4-4.

The Project-generated traffic will be routed to bypass the residential community by using US 95, then diverting to Valley View Boulevard. This route will ensure the preservation of the community ambient noise environment in the area. The cumulative traffic noise impacts from the increased Project-related traffic to the local roads and highways will result in an increase to the existing ambient noise level by less than 3 dB; therefore, the increase is considered minor.

The employees and contractors proposed for servicing the equipment within the Project's operational mechanical areas may be considered as a sensitive noise receptor location. The federal OSHA Standards regulate an individual worker's noise exposure level based on a continuous 8-hour work day. The exposure level is based on the noise source and the duration that the worker is exposed to the noise. The combined mechanical equipment noise impacts from the proposed Project within these Project operational power block areas were evaluated at a single receptor location within the eastern power block. Table 4-24 shows the calculated mechanical noise exposure levels to the eastern power block based on a continuous 8-hour workday.

Table 4-24 Noise Impacts to the Project Area from the Project Operations Based on a Continuous 8-Hour Workday		
Receiver	**Location**	**Operational Noise Impacts (dBA)**
1	Eastern Power Block	79.2

Based on the overall worst-case noise emission levels of the proposed mechanical equipment and the hours of the facility's operation, calculations show that workers located within the operational power block areas will be exposed to noise impacts of 79.2 dBA. The result of this worst-case calculated noise level demonstrates that a typical 8-hour work schedule will not expose a worker or contractor to an 8-hour TWA noise exceedance exposure limit of 90 dBA, as described by the OSHA regulations; therefore, noise exposure is considered less than significant.



Noise Impacts to the Surrounding Area from the Project Operations

Receiver	Location	Operational Noise Impacts (dBA Ldn)
1	Eastern Powerblock	80.5
2	Northern Property Line	39.1
3	Eastern Property Line	54.7
4	Southern Property Line	50.0
5	Western Property Line	54.7

40 dBA Ldn
45 dBA Ldn
50 dBA Ldn
55 dBA Ldn
60 dBA Ldn
65 dBA Ldn
70 dBA Ldn
75 dBA Ldn
80 dBA Ldn
85 dBA Ldn
90 dBA Ldn

Amargosa Farm Road Solar Energy Project
Amargosa Valley, Nevada

Aerial Image Showing Noise Impact Contours from Proposed Facility Operations

ARCADIS

FIGURE
4-4

4.5.2 Wet-Cooled Alternative

Noise impacts from construction and operation of a wet-cooled solar plant may be similar to the impacts described for the Proposed Action – Dry-Cooled Alternative The wet-cooled alternative would require an increase in the number of pumps and specialty type equipment, such as a cooling tower. According to a study conducted for the Beacon Solar Energy Project, a proposed wet-cooled solar plant in California, the noise emission levels presented for this wet-cooled solar plant are similar to the noise emission levels for a dry-cooled solar plant (Beacon Solar Energy Project 2008). The main difference between the two systems is the layout and height of the noise-producing mechanical equipment. Preliminary analysis for the wet-cooled solar plant alternative indicates the noise levels would be less than the Proposed Action – Dry-Cooled Alternative. In the dry-cooled alternative, the ACC is taller and has more fans than the wet-cooled alternative's cooling tower. While the cooling tower will be noisier near the tower due to the falling water and pump noise, this noise is generated low to the ground and will not carry because it is partially blocked by the height of the troughs in the solar field. Noise emanating from the top of the ACC will not be blocked and will only dissipate with the square of the distance from the tower.

4.5.3 No Action Alternative

Under the No Action Alternative, there would be no noise impacts from temporary construction or permanent operation of the proposed Project.

4.5.4 Mitigation

Even though significant noise impacts are not anticipated during construction and operation of the project Project, the following environmental protection measures will be implemented:

- Personnel would be required to comply with applicable federal, state, and local laws and regulations concerning prevention and control of noise during Project construction and operation.
- Equipment and trucks used for Project construction would utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds, wherever feasible).
- Stationary noise sources would be located as far from adjacent receptors as possible and would be muffled and enclosed within temporary sheds, incorporate insulation barriers or other measures to the extent feasible.
- At least 15 days prior to the start of ground disturbance, the Project owner shall provide written notification to all residents within 1 mile of the site of the start of Project construction. At the same time, the Project owner shall establish a telephone number for use by the public to report any undesireable noise conditions associated with construction or operation. This number shall be posted at the construction site.

- The Project owner shall investigate, evaluate and attempt to resolve all Project-related noise complaints. If necessary, the Project owner shall take all feasible measures to reduce the noise at its source. If the noise can not be reduced at its source, the Project owner shall investigate feasible means of reducing noise levels at the nearby residence that filed the complaint and take appropriate measures to resolve the issue.

4.6 BIOLOGICAL RESOURCES

4.6.1 Vegetation

4.6.1.1 Proposed Action

Up to 4,350 acres of desert lands will be cleared and graded to accommodate construction of the solar facility and ancillary facilities. During the life of the Project, zero vegetation will exist within the facility. Permanent impacts involve areas that are paved or otherwise precluded from restoration to a pre-Project state. Mojave desert scrub generally has a slow recovery rate, but recovery potential also depends on the nature and severity of the impact. There are permanent impacts to vegetation when there is no evidence to indicate that pre-disturbance levels of biomass, cover, density, soils, and plant community structure could be achieved within approximately 5 years.

Removal of vegetation would involve mostly shrubs such as creosote bush, saltbush, and burrobush, and widely scattered forbs and grasses, primarily cryptantha, Mediterranean grass, goldfields, and devils spineflower. Other forb species that would be removed include various annual buckwheat species (e.g., flat-topped buckwheat, Thomas' buckwheat) and several species of the primrose family (e.g., devils lantern and Booth's evening primrose).

In areas where permanent clearing and grubbing would occur, there would be coordination between the Proponent and the BLM to determine the best approach to create a level, hard packed surface in order to control dust. In other areas, construction activities could promote the proliferation of non-native invasive weeds, particularly Russian thistle, which was observed on the Project site during the 2009 surveys. This species is currently not listed by the Nevada noxious weed list, but is considered aggressive and opportunistic, and often portrays weed-like trends. Other weed species that could invade the Project site over the long term include puncture vine (*Tribulus terrestris*), perennial pepperweed (*Lepidium latifolium*), gumweed (*Grindelia* spp.), yellow star thistle (*Centaurea solstitialis*), and Russian knapweed (*Acroptilion repens*). Clearing of vegetation also could affect habitat structure and ecological function of riparian communities.

Non-native weeds may also become established in the agricultural fields whose water rights will be retired or held in abeyance as part of the water minimization agreement. Under the Proposed Action (dry-cooled alternative), up to 130 acres may be temporarily or permanently fallowed pending further discussions between the Proponent and agencies that are part of the water rights stipulations (see Appendix A).

Impacts to Special Status Species or Species Protected by the State of Nevada

The construction of the Project would directly impact two cactus species, including golden cholla (also called silver cholla) and beavertail pricklypear. Under NRS 527.060-120, it is illegal for any company or individual to cut, destroy, mutilate, remove, or possess cactus and yucca, or portions of these plants. The golden cholla and beavertail pricklypear occurrences are located in three main areas of the Project area. All cacti that are planned for removal must be approved and tagged by the BLM and translocation coordinated. No other special status plant species occur within the Project area.

Impacts to Federally Endangered, Threatened, Proposed, and Candidate Plant Species

No federally listed plant species were found in the Project area, but seven species were identified by the USFWS as occurring within the ROI, which includes the Ash Meadows NWR, located approximately 7 miles southeast of the Project area. (See Section 3.6 for the list of species.)

A BA has been prepared for the seven species that occur in the Project's ROI that could be affected by implementation of the Project. With the implementation of the water mitigation measures, there will be no direct effects from constructon and operation of the proposed Project to these seven species. While, long-term groundwater pumping of the Project could indirectly impact six of the seven plant species at Ash Meadows, the impacts would be minimal. The acquisition of the 236 afy by the Proponent as provided in the BA, is anticipated by the USFWS to likely avoid any potential adverse impacts to the aquatic species and designated critical habitats occurring at Ash Meadows NWR and Devils Hole that may be affected by groundwater pumping.

The USFWS identified the white bearpoppy (*Arctomecon merriamii*), a species at risk by the NNHP, as warranting impact analysis. During extensive plant surveys conducted within the Project area in 2009, the bearpoppy was not found, although low quality habitat is present. Based on its absence, there are no known impacts to the species as a result of the Project, and no avoidance and mitigation measures developed for the plant.

4.6.1.2 Wet-Cooled Alternative

Under the wet-cooled alternative, direct impacts to on-site vegetation would be similar to those under the Proposed Action. Under both alternatives, up to 4,350 acres would be graded and cleared for the Project footprint. Indirect impacts from use of groundwater for Project operations would be similar to current conditions, as no increased pumping would occur. With either a wet- or dry-cooled option, water rights would be leased or purchased from existing water right owner(s) who have utilized their annual duty on a regular basis. It could be assumed that the water that would be acquired for the wet-cooled option may still be used on an annual basis by the current water rights owner(s) in the current capacity. Therefore, impacts to nearby sensitive plant species would have minimal change if the usage average remains consistent throughout the life of the Project. The minimal change will be due to the conversion of agricultural use to industrial uses because of the reduction of return flow from irrigation.

The principal indirect impact to vegetation resources under the wet-cooled alternative would be from groundwater stipulations mandated by the NPS, USFWS, and BLM to acquire and properly manage additional water rights above and beyond those needed for Project construction and operation. Should similar agreements be required under the wet-cooled alternative, the Proponent would be required to acquire and either retire or hold these water rights in abeyance until studies could be conducted to better understand how these minimization water rights would impact area resources. These include flows at Devil's Hole, Ash Meadows NWR, and overall local and regional water levels.

4.6.1.3 No Action Alternative

Under the No Action alternative, the proposed Project would not be constructed, and there would be no effects of construction and operation of the proposed Project on local or regional vegetation resources. However, groundwater would continue to be pumped in the Amargosa Desert Hydrographic Basin and DVRFS with unknown impacts to sensitive water resources area, including Devils Hole and springs and seeps in the Ash Meadows NWR.

4.6.1.4 Mitigation

A comprehensive Noxious Weed Management Plan (Plan) will be prepared with the goal of keeping the Project area free from noxious weeds (Mitigation Measure Veg5). Adherence to the specific weed control mitigation measures in this Plan will minimize the introduction and spread of noxious and invasive weeds during and following construction of the Project. Early detection and rapid response are important considerations in the development of the Plan which includes: (1) Identification of problem areas or potential weed sources such as existing seed banks, vehicles, incoming fill materials, and construction control methods such as straw bales, (2) preventative measures that will be implemented to prevent the spread of these and other noxious weeds during construction such as the establishment of vehicle wash stations, (3) treatment methods during construction and post-construction, and (4) reclamation and post-construction monitoring to prevent the rapid spread of noxious weeds. This Plan will also help minimize impacts to native plant communities temporarily impacted by the Project. In lieu of a completed weed plan at this time, the weed control expectations and requirements are summarized as follows, and need to be represented in the EIS document:

- Weeds in the Project area will be controlled/eradicated to the degree established by BLM approving officials, which is a level of zero tolerance. The term 'weed' applies to seed production as well as plant growth.
- Weed populations of existing weeds that are ubiquitous in immediate adjavent lands are to be controlled to a level equal to or below that of the original Project site and adjacent lands. At this time, these weeds are limited to red brome, filaree, and schismus. Populations will not be allowed to exceed ambient densities.
- Herbicide use for vegetation control is restricted to areas fenced off to Desert Tortoise travel and inhabitation. There are no herbicides approved for use in Desert Tortoise habitat at this time, or in the near foreseeable future. It is understood that weed and vegetation control without the use of herbicides may greatly increase costs of control.

These costs are acknowledged and weed levels will continue to be maintained to the required degree established by the BLM.

Refer to Appendix A for a compilation of mitigation measures that will be used to minimize or eliminate impacts to native vegetation resulting from construction and operation of the Project (Mitigation Measures Veg1-4 and Veg6-8). Following the implementation of these measures, impacts would be reduced to vegetation by keeping construction vehicles and other activities restricted to pre-designated areas, instructing construction personnel on the protection of native vegetation, limiting Project construction to pre-determined areas based on the temporary and permanent disturbance areas, and flagging, salvaging, and replanting those species identified by BLM as sensitive. Proper mitigation measures would be required during all phases of the Project, including construction, and operation and maintenance.

4.6.2 Wildlife

4.6.2.1 Proposed Action

Clearing and grubbing vegetation would directly impact wildlife resulting in loss of, and fragmentation of cover, breeding, traveling, and foraging habitat. Clearance surveys prior to construction would ensure that construction activities would not cause mortality to individuals from collapsing dens and burrows, thereby entombing adults their eggs or young. Mortality could occur from collisions with equipment and vehicles. In addition, predation could increase as construction displaces wildlife from protected cover to uncovered habitat. Common predators attracted to areas of increased activity and noise include coyotes, foxes, raptors, ravens, and domestic dogs. The less mobile species (e.g., reptiles, small mammals, ground-nesting birds) would be particularly susceptible from grading and construction activities, as these activities could cause mortality to those animals (see discussion on *mammals, migratory birds, and reptiles* below).

During the scoping phase of the Project, other general wildlife issues were identified including: (1) impacts from shading of desert habitat caused by solar fields; (2) effects of fencing on wildlife; (3) impacts to local ecosystems; (4) impacts to birds resulting from heat generated by mirrors; (5) impacts resulting from use of security lighting; and (6) increased noise during construction and operation of the Project. These issues are discussed below.

Permanent clearing and grubbing would be performed for the solar fields; as such, no native vegetation would remain. Although 4,350 acres of wildlife habitat loss is a significant impact, there would be no impacts from shading of desert habitat. Fencing typically creates a barrier for wildlife movement through an area, but if vegetation is completely removed for construction of the solar field, it is highly unlikely wildlife would use the site as a travel corridor. According to NDOW, big game such as mule deer and bighorn sheep do not utilize the area regularly (see section on *Big Game* below), although other wildlife may use Fortymile Wash as a movement corridor. Lighting may contribute to the collision risk of birds and bats, especially nocturnal species, and other wildlife that occur adjacent to the Project site such as nesting birds, foraging mammals, and flying insects. Noise can disrupt normal activity and behavior of wildlife, especially nesting and foraging birds (see discussion on migratory birds below).

Evaporation ponds used to collect blowdown water from the cooling tower would introduce a potential threat to wildlife. Since the tortoise-proof perimeter fencing will restrict most terrestrial wildlife from entering the plant site, it is anticipated that birds and bats will face the greatest potential risk from constituents in the evaporation ponds. To the extent the evaporation ponds could lead to increased predation of terrestrial wildlife by birds, the measures described below to prevent birds from visiting, drinking, or otherwise using the ponds will avoid that effect.

The primary constituents of the evaporation pond water that could have a potential adverse effect on wildlife are hyper-saline conditions resulting from high TDS concentrations. Species at risk are those with the potential for nesting at the facility, residents of the area that would drink and forage from the ponds or feed on insects associated with the ponds, and migrants that would use the ponds for a stopover during migration. To reduce the potential for impacts from the ponds, a series of avian and bat deterrence measures will be incorporated into the design and operation of the evaporation ponds to minimize pond access by birds and bats. The use of anti-perching devices around the perimeter of each pond will prevent ravens and other birds from accessing the edge of the ponds to drink any of the water. Additionally, the operational design of the ponds is such that a minimum freeboard of 2 feet will be kept at all times, and the interior sides of the ponds will be at a 33 percent slope (3:1, horizontal:vertical). These design features will make it difficult for perching birds and/or shorebirds to access the water and are anticipated to minimize risks to wildlife by minimizing availability of a new water source.

Mammals

Big Game – Desert (Nelson) Bighorn Sheep (*Ovis Canadensis nelsoni*) and Mule Deer (*Odocoileus hemionus*) occupy the mountainous areas surrounding the Project area, but according to NDOW (Tierra Data 2009) there is no evidence to suggest there is population connectivity or regularly traveled movement corridors east to west across the Amargosa Valley; as such, impacts to big game species are not anticipated for this Project.

Other Mammals – During biological surveys conducted in 2009 in support of this Project, a total of 18 mammal species were observed in the Project area. Construction and operation of the Project may cause direct mortality to burrowing mammals identified in Section 3.6. Those animals displaced during construction could be crushed by equipment and vehicles or be killed by increased predators in the area. The bats forage on insects, so removal of vegetation and rechanneling of washes during construction could disrupt natural foraging habitats for bats in the Project area. After completion of the Project, bats may find Project components attractive for roosting or foraging.

Migratory Birds

Habitat in the Project area provides cover, breeding, foraging, and traveling habitat for a number of bird species. During biological surveys conducted in 2009, 27 species were observed in the Project area.

Bald and Golden Eagles are not known to frequent the Amargosa Valley on a regular basis. Although adjacent agricultural fields may provide foraging habitat for these species, the Project site is sparsely vegetated and contains low quality foraging habitat. The nearest higher quality

foraging habitat is the Ash Meadows NWR area. Therefore, the construction and operation of the proposed Project will not affect Bald and Golden Eagles. To further reduce potential impacts to Bald and Golden Eagles the Proponent has voluntarily agreed to prepare and implement a project-specific Avian and Bat Protection Plan. The Avian and Bat Protection Plan will be prepared in consultation with the BLM and USFWS.

The Project area contains suitable habitat for Burrowing Owl and the LeConte's Thrasher, and both species are known to occur in the area. LeConte's Thrashers build their nests in shrubs 2 to 4 feet off the ground, so shrub removal would eliminate nesting, cover, and foraging potential for the bird within the Project footprint. Suitable nesting and foraging habitat are absent for the Phainopepla. Therefore, no impacts are anticipated for this species, even though it was observed in the Project area in the Spring 2009.

The Project area does not contain suitable nesting or roosting habitat for raptors, and only marginal foraging habitat for these species. Suitable nest sites for Swainson's Hawk may occur in adjacent agricultural areas; however, no nesting habitat exists in the vicinity for Prairie Falcon.

The NDOW and USFWS identified other species with heightened conservation priority that could be impacted by construction and operation of the Project. They include Bendire's Thrasher and Loggerhead Shrike. Neither of these species were detected during 2009 surveys.

Bendire's Thrasher is included as a Watch List species by Partners in Flight, which calls for the species conservation due to restricted continental range and small population size. Since no occurrence of Bendire's Thrasher have been documented within the Project area, it is highly unlikely that the construction and operation of the proposed Project would impact this species.

The Loggerhead Shrike is included as a Priority Species by Partners in Flight due to declines from habitat loss, pesticides, and winter mortality. Habitat in the Project area contains unsuitable nest tree structure, and does not provide adequate perch areas for the bird, making it highly unlikely the Loggerhead Shrike would nest within the Project area. However, if suitable nesting trees or shrubs are present nearby, the Project could provide foraging habitat, and foraging potential could increase after completion of the Project due to the presence of taller structures that could serve as perches or lookouts.

For those bird species that have the potential of nesting in the Project area, the loss of active bird nests or young is regulated by the federal MBTA, so it is unlawful to pursue, hunt, take, capture, kill, or possess any migratory bird or part, nest, or egg of such bird listed in 50 CFR 10.13. The MBTA applies to the bird species that will be impacted during the construction phase of the Project. Compliance with the MBTA will require surveying for and delineating non-disturbance buffers for nesting birds during the breeding season.

Noise from construction activities could temporarily disturb wildlife from foraging and nesting immediately adjacent to the Project area. Birds rely on vocalizations during the breeding season to attract a mate within their territory and to respond to potential dangers in the area and young begging for food. Noise levels from certain construction and operation activities could reduce the reproductive success of nesting birds.

Reptiles

Grading and construction activities and vehicle use could cause direct mortaility to slower-moving reptiles. These cold-blooded animals use their environment to thermoregulate, and because they cannot shelter themselves from heat and cold during construction activities, they would likely die from exposure, predation, or crushing from vehicles and equipment.

Snakes and Lizards – During biological surveys conducted in 2009 for the proposed Project, a total of six snake species and six lizard species were found in the Project area (see Section 3.6 for identified list of species). Of the 12 total species of snakes and lizards present in the Project area, the Desert Iguana is on the NNHP Plant and Animal Watch List, which means the iguana is vulnerable to decline by habitat loss. Construction of the Project would eliminate iguana habitat that includes creosote bush on sandy soils. The second reptile that has been identified as a conservation priority species is the Nevada Shovel-nosed Snake. The reach of Fortymile Wash located inside the Project limits will be bladed and rechanneled around the periphery of the solar facility; therefore, Nevada Shovel-nosed Snake habitat will be eliminated during construction of the Project.

Amphibians

The southern limit of the Amargosa Toad's range is located in Oasis Valley near Beatty, approximately 25 miles north of the Project area. Due to the lack of permanent water this species is not expected to occur within the Project area. Furthermore, groundwater pumping for the Project is not expected to impact the hydrological function of the Oasis Valley watershed, and therefore will not impact toad habitat in Oasis Valley.

Impacts to Federally Endangered, Threatened, Proposed, and Candidate Wildlife Species

Desert Tortoise

The Project is located in the Desert Tortoise Eastern Mojave Recovery Unit and near the border of the Northwestern Mojave Recovery Unit, but is not designated as critical habitat. Construction of the Project would eliminate approximately 4,350 acres of low quality Desert Tortoise habitat. During surveys conducted in 2009 for the proposed Project, no live or dead tortoises were found, but four old Class 4 burrows were located in the northwest portion of the Project area.

In the event that a tortoise is found in the Project area, impacts would include loss of foraging, nesting, and cover sites; loss of dispersal areas and connectivity to other areas; and contracted home ranges. Juvenile Desert Tortoise may face an increased risk of predation from raptors and ravens attracted to the site and increased availability of perches. Tortoises may also face impacts due to increased risk from roads and traffic. The site will be surrounded by tortoise-proof fencing to prevent any Desert Tortoise from becoming entrapped by the flood control channels or impacted by work occurring within the facility.

Ash Meadows NWR Species

Four fish (Devils Hole Pupfish, Ash Meadows Amargosa Pupfish, Warm Springs Pupfish, and Ash Meadows Speckled Dace) and one invertebrate (Ash Meadows naucorid) inhabit the Ash

Meadows NWR within the Project's ROI and could be affected by implementation of the Project. It is anticipated that there will be no direct effects to the species. However, long-term groundwater pumping of the Project could indirectly impact these species. Based on the results of the DVRFS model, it has been found that these impacts would be minimal resulting in a drawdown of 0.05 feet over 200 years.

Groundwater mitigation measures stipulated by the NPS, USFWS, and the BLM will avoid the potential effect of groundwater pumping for Project water requirements on sensitive wildlife resources in Ash Meadows NWR and Devils Hole.

4.6.2.2 Wet-Cooled Alternative

Under the wet-cooled alternative, impacts to wildlife would be similar to those under the Proposed Action. The primary difference would be the number and size of evaporation ponds for each alternative (four 4-acre evaporation ponds with the dry-cooled alternative [total 16 acres], versus three 8.3-acre evaporation ponds with the wet-cooled alternative [total 25 acres]).

For either the wet- or dry-cooled alternatives, the Proponent would either lease or purchase existing certified water rights for water needs during construction and operation of the proposed Project. Water rights would be acquired from existing water right owner(s). Groundwater flow model simulations and a hydrologic analysis have been performed for the dry-cooling alternative. It could be assumed that the water that would be acquired for the wet-cooled option may still be used on an annual basis by the current water rights owner(s) in the current capacity. Therefore, impacts to nearby wildlife resources would have minimal change if the current 10-year average remains consistent throughout the Project life. The minimal change would be due to the conversion of agricultural water rights to industrial water rights, because of the reduction of return flow from irrigation.

The principal indirect impact to wildlife resources under the wet-cooled alternative would be from groundwater stipulations mandated by the NPS, USFWS, and BLM to acquire additional water rights above and beyond those needed for Project construction and operation. Since up to 4,600 afy is required for operation of a wet-cooled plant, it is likely that the agencies would require the Proponent acquire several thousand acre-feet of additional water to offset potential effects to sensitive resources at Ash Meadows NWR and Devils Hole. This action would result in the reduction of groundwater pumping in the Amargosa Desert Hydrographic Basin and the fallowing of large parcels of active farmland in the Amargosa Valley. While the reduction of groundwater pumping in the basin may indirectly reduce impacts to sensitive resources in Ash Meadows NWR and Devils Hole, the fallowing of farmland in the Amargosa Valley will reduce foraging habitat for certain wildlife species including, but not limited to, migratory birds, reptiles, and the prey that depend on these species. The spread of invasive species and noxious weeds on fallowed lands would be substantially worse under the wet-cooled alternative, since much more land would need to be fallowed.

4.6.2.3 No Action Alternative

Under the No Action alternative, the proposed Project would not be constructed, and there would be no effects of construction and operation of the proposed Project on local or regional vegetation resources. However, groundwater would continue to be pumped in the Amargosa Desert Hydrographic Basin and DVRFS with unknown impacts to sensitive water resources area, including Devils Hole and springs and seeps in the Ash Meadows NWR.

4.6.2.4 Mitigation

The creosote bush series of Mojave desert scrub provides foraging, cover, and breeding habitat for migratory birds. The construction and operation of the proposed Project would eliminate nesting habitat and result in direct and cumulative impacts to these species due to habitat loss or injury/mortality of individuals. To avoid and minimize impacts to migratory birds, mitigation measures WL1 through WL2 have been proposed; mitigation measures WL3 and WL4 address the Burrowing Owl specifically. To discourage raptors from perching on the 230kV transmission line, mitigation measure WL5 is proposed. In addition, the Proponent has voluntarily agreed to prepare and implement a project-specific Avian and Bat Protection Plan. The Avian and Bat Protection Plan will be prepared in consultation with the BLM and USFWS.

The construction and operation of the proposed Project would result in the loss of approximately 4,350 acres of low quality tortoise habitat. According to the BLM's "*Desert Tortoise Habitat Management on the Public Lands: A Rangewide Plan,*" compensatory mitigation is required to offset the impact and fully mitigate for Desert Tortoise. Mitigation measures WL6 through WL22 will be implemented to minimize and avoid impacts to Desert Tortoise. Following USFWS review of the BA, the level of compensatory mitigation required for this Project will be determined. All terms and conditions detailed in the Biological Opinion will be adhered to. It is anticipated that by following the guidance in the Biological Opinion as well as the mitigation detailed below, impacts to biological resources will be minimized.

Remuneration fees will be collected by the BLM for the Project. Tortoise remuneration fees will be used for management actions expected to provide a benefit to the Desert Tortoise over time. Actions may involve habitat enhancement, population enhancement, education, and research, studies, and monitoring. Habitat enhancement may include such actions as restricting uses that may have detrimental effects on habitat quality, restoration of disturbed areas, and restricting uses that may have detrimental effects on habitat quality. Population enhancement may include such actions as predator control, captive breeding, and relocation programs. Education programs can be developed that are aimed at school-aged children, community leaders, special interest groups, or the general public. Research is critical to the recovery of any species. Remuneration fees may be applied to research projects that can enhance knowledge of tortoise biology, threats to the species, and applied management methodology. Fees collected for the Project will be utilized at the discretion of the BLM for Desert Tortoise recovery or improvement.

Gila Monsters were not found during the biological surveys conducted in 2009, but the species is difficult to detect and cannot be assumed to be absent based on the surveys. If they are present in the Project area, they could be harmed or killed during construction activities. To avoid or

minimize potential impacts to the Gila Monster, conservation measures WL23 and WL24 are proposed.

Appropriate mitigation measures would be required during, construction, and operation and maintenance of the proposed Project. A list of mitigation and conservation measures is included in Appendix A.

4.7 HISTORIC AND CULTURAL RESOURCES

The following presents possible environmental consequences to known cultural sites.

4.7.1 Proposed Action

Based upon the complete cultural inventory of the proposed Project's APE, 13 prehistoric and/or historic cultural sites in the currently proposed Project area were newly recorded and evaluated to whether they were eligible for listing on the NRHP. The BLM and the Nevada SHPO both concurred that only one prehistoric site (26Ny13440) is an eligible property that could yield important information regarding prehistory in southern Nevada. Due to the site's size and composition, it would be adversely impacted by proposed Project activities in both action alternatives.

Mitigation for Site 26Ny13440, in consultation with the SHPO as per 36 CFR 800.6, would be addressed under a Memorandum of Agreement between BLM and the SHPO, regarding site treatment that would involve formal data recovery measures prior to Project-related ground-disturbing activities. Tribal representatives are also in agreement with the BLM and SHPO on the eligibility status of the cultural sites and regarding the fact that data recovery needs to occur for Site 26Ny13440. Given the low density of sites in this large Project area, the potential for unanticipated discoveries is low.

In the unlikely event that human remains, funerary items, or intact deposits of buried cultural materials are discoveredly during construction of the proposed Project, all work in the immediate area would be immediately halted, and the resource would be protected by following the protocols set forth in the October 26, 2009 State Protocol Agreement between the BLM and the Nevada SHPO. Work in the area would not be allowed to proceed until the finds were examined and assessed for eligibility for listing on the NRHP.

A field inspection of the viewshed surrounding the Project area was also performed and resulted in the determination that there would be no visual impacts to any historic properties in the town of Amargosa.

4.7.2 Wet-Cooled Alternative

Impacts to cultural and historic resources from construction and operation of a wet-cooled solar plant would be the same as to the impacts described for the Proposed Action (dry-cooled alternative).

4.7.3 No Action Alternative

Under the No-Action alternative, the proposed Project would not be constructed and neither Site 26Ny13440 nor any undiscovered historic or cultural resources would be affected by any Project activities.

4.7.4 Mitigation

Mitigation for Site 26Ny13440 or any undiscovered eligible sites, in consultation with the SHPO as per 36 CFR § 800.6, would be addressed under the approved Treament Plan and would involve all approporiate formal data recovery prior to Project-related ground-disturbing activities.

4.8 PALEONTOLOGICAL RESOURCES

This section describes and evaluates the potential impacts on paleontological resources that would result from the construction, operation, maintenance, and decommissioning of the proposed Project.

4.8.1 Impact Assessment Methodology

In order to assess the relative impact each alternative may potentially have on paleontological resources, potential impact levels were determined for each alternative based on the PFYC, the inventory database of fossil localities, and the paleontological resources survey. Literature research, institutional record searches, the paleontological resources survey, and the PFYC provided the information necessary to assign a potential impact level of high, low, or moderate/undetermined to portions of the Project area. Future provisions for mitigation of adverse impacts to significant paleontological resources exposed during construction-related activities in the Project area are based upon these determinations of potential impact level. The terms "high potential impact level," "low potential impact level," and "moderate/undetermined potential impact level" are defined as follows.

High Potential Impact Level. Geological units with a high potential for containing significant paleontological resources are determined to have a high potential impact level. In these cases, the geological unit contains a high density of recorded fossil localities, has produced fossil remains in or near the vicinity of the proposed Project, and is very likely to yield additional remains during construction. Areas identified as having a class 4 or 5 in the PFYC system are considered to have a high potential impact level.

Low Potential Impact Level. The geological unit contains no or a very low density of recorded fossil localities, has produced little or no fossil remains in the vicinity of the proposed Project, and is not likely to yield any fossil remains. Nevertheless, geological units with few or no prior recorded fossil localities can still prove fossiliferous during paleontological mitigation activities. Areas identified as having a class 1 or 2 in the PFYC system are considered to have a low potential impact level.

Moderate/Undetermined Potential Impact Level. The geological unit has limited exposure in the Project area, is poorly studied, or contains no recorded paleontological resource localities. However, in other areas, the same or similar geological units may contain sufficient paleontological localities to suggest that exposures of the unit in the Project area would have at least a moderate potential for yielding fossil remains. Areas with a class 3 in the PFYC system are considered to have a moderate or undetermined potential impact level.

The analysis of impacts to paleontological resources is based on a literature review of known resources, record searches at paleontological institutions, the paleontological resources survey, and assignment of paleontological potential based on geological units and known fossil localities. The following indicators were considered when analyzing the potential impacts to paleontological resources:

- known fossil localities
- proximity to geological units with potential to contain paleontological resources
- depth of excavations associated with Project components

The following section describes the potential impacts on paleontological resources for each Project alternative.

4.8.2 Proposed Action

The Proposed Action is anticipated to have a low impact on paleontological resources within the Project area. Low impact areas comprise young alluvial deposits (Qay) and intermediate alluvial deposits (Qai). These geological units are considered to contain a low potential for paleontological resources.

4.8.3 Wet-Cooled Alternative

Impacts to paleontological resources from construction and operation of a wet-cooled solar plant would be to the same as the impacts described for the Proposed Action (dry-cooled alternative).

4.8.4 No Action Alternative

Under the No Action Alternative, there would be no Project-related impacts to paleontological resources.

4.8.5 Mitigation

The primary impact issue for paleontological resources is the loss of scientifically significant fossils and their contextual data. Two types of impacts could potentially affect paleontological resources:

- Direct and permanent ground disturbance during construction

- Indirect and permanent disturbance due to changes in public accessibility

The primary concern regarding impacts to paleontological resources is that direct damage or destruction of fossils would result in the loss of important scientific information. It is possible that ground disturbance, such as grading and cutting of access roads, could encounter important paleontological resources. In addition, adverse impacts indirectly associated with construction are a concern. For example, fossils could be subject to damage or destruction by erosion that is accelerated by construction disturbance. Improved access and increased visibility as a result of construction could cause fossils to be damaged, destroyed, or collected as a result of unauthorized collection or vandalism. However, not all impacts of construction are adverse to paleontology. Excavation can and often does reveal significant fossils that would otherwise remain buried and unavailable for scientific study. In this manner, excavation can result in beneficial impacts. Such fossils can be collected properly and catalogued into the collection of a museum repository so that they can be available for scientific study.

Results of the data inventory, paleontological resources survey, and impact assessment demonstrate that the geological units present in the Project area have a low potential to contain significant paleontological resources. As a result, specific mitigation measures are not necessary. However, should significant paleontological resources be discovered during construction, then mitigation measures should be implemented to reduce potential adverse impacts to significant paleontological resources resulting from Project construction. The mitigation measures described in Appendix A are in compliance with the SVP standard guidelines for mitigating adverse construction-related impacts on paleontological resources and should be followed if significant paleontological resources are discovered during construction (SVP 1995). Implementation of these mitigation measures will effectively reduce potential impacts to paleontological resources to a negligible level by allowing for the collection of fossils and corresponding geological and paleo-environmental data that otherwise might be lost to earth-moving activities. The scientific and educational value of the fossils and their associated contextual data constitute the chief significance of the resource. Their collection, therefore, mitigates the impacts to paleontological resources. These mitigation measures are subject to review by the BLM.

4.9 SOCIOECONOMIC RESOURCES

The following sections discuss the potential effects of construction and operation on the socioeconomic resources within the ROI.

4.9.1 Proposed Action

Implementation of the Proposed Action would have a direct and indirect effect on regional social and economic resources from the increase in the level of economic activity in the area that would result from construction and operation of the proposed Project.

4.9.1.1 Project Work Force and Population

Construction

Project construction is expected to occur over a 39-month period. During construction, manpower needs would average approximately 650 employees per day, peaking to approximately 1,300 workers in Month 17 of construction. This would make the proposed Project the largest employer within the Amargosa Valley, with the next highest being Ponderosa Dairy with approximately 120 employees.

The primary trades required for construction of the proposed Project will include pipefitters, skilled and unskilled laborers, electricians, carpenters, cement finishers, equipment operators, sheet metal works, ironworkers, and truck drivers. The proposed Project would be expected to draw from available construction labor in the regional area. Prior to commencement of construction activities, the Proponent will conduct at least two public meetings in the Town of Amargosa to provide information about employment opportunities. The Proponent has agreed as part of the Development Agreement signed with Nye County to make commercially reasonable efforts to hire applicants that reside in Nye County and request that its subcontractors do the same (Nye County 2010).

As shown in Table 4-25, even at the peak of construction (approximately 1,300 workers), the current availability of approximately 86,000 construction workers in Nye and Clark counties in 2010 would be sufficient to meet the employment needs during construction, although a small number of workers in some specialized trades may come from outside the region. Construction of the proposed Project would require less than 2 percent of the available workforce in the regional area; thus, construction labor demand would not significantly affect the availability of construction labor in the region.

Table 4-25 Construction Industry Employment

	2006	2008	2010 Forecast	% Change 2006 to 2010
Nevada	141,874	118,837	85,895	
Annual Percentage Change	-	-16.2%	-27.7%	-39.5%
Las Vegas Metropolitan Statistical Area	108,430	94,149	68,392	
Annual Percentage Change	-	-13.2%	-27.4%	-36.9

Source: Nevada Department of Employment, Training and Rehabilitation: Nevada Workforce Informer 2009.

In addition, Nevada and particularly the Las Vegas area have been hit hard by the recent economic downturn, which has led to high job losses in construction. Thus, a plentiful workforce is likely to be available in the region to fill the employment needs of the Project.

Operations

The Project site would be staffed 24 hours a day, 7 days per week during operations. An estimated workforce of 70 to 100 full-time employees would be needed to staff the first phase of the Project (Unit #1). When the second of the 2 units comes online, an estimated total of 170 to 200 full-time staff would be needed (Table 4-26). The operations workforce would consist of plant and solar field supervisors, and operators and maintenance technicians working 12-hour shifts, and management and administrative personnel working 8-hour shifts per day. Skill levels for the various staff positions would be a combination of management, technical, and lesser skilled operational positions.

Table 4-26 Estimated Employment for Operation and Maintenance

	Unit 1	Units 1 & 2
Gross Capacity per plant, MW	250	500
General & Administration		
Plant Manager	1	1
Administrative Assistant	1	1
Administrative Clerk	1	1
Accountant	1	1
Computer Technician	1	2
Plant Engineer	1	2
Performance Engineer (Service Contractor)	1	1
Planner/Purchasing	1	2
Material Handler	2	3
Security/Guard	3	3
Custodian (Office Maintenance & Cleaning)	1	2
Subtotal	**14**	**19**
Solar Field Maintenance		
Solar Field Manager	1	1
Solar Field Supervisor (Service Contractor)	3	4
Mechanical Technician	7	11
Welder	3	5
Instrumentation & Control Technician	3	5
Field Laborer	5	7
Reflectivity Technician	15	25
Subtotal	**37**	**58**

Table 4-26 Estimated Employment for Operation and Maintenance		
	Unit 1	**Units 1 & 2**
Power Plant Operations		
Operations Manager	1	1
Operations Supervisor	1	1
Control Room Operator	4	8
Power Plant Operator	4	8
Solar Field Operator	4	8
Subtotal	**14**	**26**
Power Plant Maintenance		
Maintenance Manager	1	1
Plant Maintenance Supervisor	3	5
Electrician	3	5
Instrumentation & Control Technician	3	5
Mechanic	3	5
Welder	3	5
Machinist	3	5
Subtotal	**19**	**31**
Total Staff	**84**	**134**

The more skilled operations would generally require some secondary education and greater mechanical/electrical equipment experience than the lesser skilled operation position. Project construction workers and more experienced farm or other equipment operators would be expected to have transferrable skills suitable to those required for these positions.

Approximately half the operations jobs would be lesser skilled positions. All employees would be provided with necessary training. The basic job requirements for the lesser skilled operations workers would likely be high school diplomas and basic mechanical equipment operating abilities.

On-the-job training could be expected to enable, over time, some lesser skilled employees to gain the expertise necessary to staff the more skilled operations positions. In addition, Great Basin College in Pahrump has recently developed solar job training courses specifically designed to provide its students with the training necessary to work in the solar industry. The Proponent and other solar energy developers in the Amargosa Valley (e.g. Abengoa, SolarReserve) have met with various educational institutions and agreed to work with them to ensure training is available (Pahrump Valley Times 2010).

While the need for skilled plant operators for the facility's future operations would likely exceed the region's existing supply of unemployed plant operators, there would also be individuals amongst the region's unemployed that have or could obtain the necessary training to perform the facility operations. Also, it is likely that some of the currently employed workers would change their jobs to obtain a better paying job and/or to work closer to home. Given the region's high unemployment levels, any currently employed worker switching jobs could expect to have their vacated position filled by other workers (possibly including others living outside of the regional study area). Consequently, it is expected that most of the facility's operations employment would be provided by workers living within the regional study area from the site.

4.9.1.2 Population and Housing

Construction

It is anticipated that the vast majority of the construction workforce (peak workforce of approximately 1,300 workers and an average of approximately 650 workers per day over the 39-month duration of construction) would commute to the Project area. Given the high construction unemployment rates in Nye County and the Las Vegas area factored with the current economic condition, including the inability of homeowners to sell their homes to cover what they owe, it is assumed that the majority of workers will commute rather than relocate to the Amargosa Valley. Thus, impacts to the local population are expected to be minimal, and would not induce substantial growth in the Amargosa Valley. Additionally, the Project area is in a remote, sparsely inhabited area and would not displace existing populations.

A few construction workers may choose to permanently relocate to the communities near the Project area during the construction phase. These include the Town of Amargosa Valley, Beatty, and Pahrump. There are approximately 613 hotel/motel rooms and suites among nine different establishments in the Amargosa Valley, Beatty, and Pahrump, with extensive additional temporary housing available in the Las Vegas metropolitan area. Thus, should some construction workers choose to stay temporarily at a local area motel or hotel, there would be ample transient housing.

Additional housing opportunities are available in the form of RV and mobile home sites. There are over 225 RV spaces in three locations in Amargosa Valley: Longstreet Inn & Casino, My Own Mobile Home Park, and Fort Amargosa RV Park. Additional RV spaces are available in Beatty and Pahrump. Availability varies depending on season, with greater availability during the summer months. Should a portion of the workers relocate to the area for the duration of their construction assignments, effects to available housing and population would be minor, as the 2008 residential vacancy rate was over 15 percent in Pahrump, and the 2000 vacancy rates in Amargosa Valley and Beatty were over 20 and 26 percent respectively. Because the construction workforce largely will commute to the area rather than relocate, increased demand on the local housing supply is expected to be minor.

Operations

Operation of the Project is expected to have a minor impact on the availability of regional housing due to the relatively small number of workers needed for plant operations, and the abundance of available local housing and land in the Amargosa Valley.

The proposed Project would be constructed on undeveloped BLM managed lands. Because the Project area is designated by the BLM for disposal and incorporated into the Amargosa Valley Area Plan as future energy development, the views from residential subdivisions could change, depending on existing site conditions and current viewshed. Visual impacts of the proposed Project are discussed in section 4.12. Indirect socioeconomic impacts may also include noise, air quality issues, and increased traffic.

Future facility operations may encourage, at most, a small number of people to relocate to the area. The small magnitude of the potential action-related in-migration would be readily accommodated by the local area's existing housing and, consequently, would not result in new and unplanned growth or land use changes. Therefore, it is concluded that the Proposed Action would not induce substantial growth or concentration of population in the Amargosa Valley.

4.9.1.3 Affected Groups and Attitudes

This section focuses on the potential social, cultural, and health impacts on stakeholder groups. The quality of life or subjective well-being of affected groups and individuals is of particular concern. Relevant here are stakeholder perceptions of potential impacts on the integrity, quality, use, and enjoyment of the environment and of socioeconomic resources, including direct, indirect, and cumulative impacts. Resources here are defined to include the traditional landscape and its uses, the community and its characteristic way of life, and the stakeholder's values. The quality of life can be affected by the proposed Project itself in all its phases, by perceptions of the proponents of the proposed Project as trustworthy, and by opportunities for participation in governance and the policy making processes concerning stewardship of public lands resources. It is particularly important that participants recognize that their input has real consequences and has a real impact on agency decisions.

Immediate Neighbors / Immediate Neighbors with Responsibility for the Health and Safety of Community Residents

Under the Proposed Action, job and local economic development during construction and immediately after would be a tremendous benefit to those residents who acquire these jobs. In the Development Agreement with Nye County, the Proponent has agreed to make commercially reasonable efforts to hire Nye County workers and will request its contractors to do the same (Nye County 2010). This would provide beneficial impacts for currently unemployed local residents. Moreover, some local businesses that have been affected by the economic downturn may experience economic growth providing job stability to their employees. The business generated by the proposed Project may provide the economic stimulus to prevent employees from job loss and exposure to the negative economic, health, and social consequences of job loss, thereby having indirect beneficial impacts on them.

An influx of new individuals with different values, lifestyles and/or socio-demographic backgrounds could have a positive or negative influence on the quality life and/or community values. As noted in Section 3.9.2.3, there are mixed views of immediate neighbors about the proposed Project. Besides jobs, potential perceived positive impacts include enhanced town services and facilities through an expanded tax base and through the proposed Project's proponents voluntary contributions, and potential for youth to get apprenticeships. Residents were concerned about the increased fire risk and risk to volunteer firefighters that the proposed Project would present, but several mitigations address these concerns: (1) contributing to fire-fighting equipment acquisition and upgrading (Fuller 2010); (2) as per the Development Agreement, providing emergency and fire protection training for up to four people, with priority for Amargosa Valley volunteer firefighters; (3) as per the Development Agreement, providing the county with access to a water supply to fight fires (Nye County 2010).

Other potential impacts include enhancement of subjective well-being through developing a local identity and local pride as being a national leader in the provision of solar energy.

Immediate neighbors were also concerned about the Project having detrimental effects on their quality of life through negative visual impacts, use of groundwater for construction and operations, health and safety issues, and increased construction traffic, fugitive dust, and noise. These issues and mitigation measures, if required, are described in the specific section for that resource (i.e. fugitive dust, see Air Quality – Section 4.1; use of groundwater, see Section 2.3.6 and Water Resources – Section 4.4; construction and operation noise, see Noise – Section 4.5; visual impacts, see Section 4.12; and health and safety concerns, see Section 4.13).

Outdoor Recreationalists

The Project area is used for OHV riding, horseback riding, strolls from town, and hiking and acts as access for some town residents to more distant public lands. While the construction and operation of the proposed Project would remove these lands from these types of uses, adjacent public and private lands remain available for these uses. Per the Nye County Development Agreement, the Proponent will develop a landscaped buffer between the eastern boundary of the Project site and Sandy Lane. Although final plans have not been developed, the Proponent envisions the landscaped area would include walking paths for recreational opportunities.

Environmentalist Groups and Stewards

The people in this group are especially concerned about water use and its impact on wildlife, on plants, and on the very physical structure of the land, with the cumulative impacts being of particular concern. If the proposed Project does not go forward it is likely that the water issues will recur when other developers seek those same water rights. Loss of open space is a detrimental impact for these groups, but as open space is abundant in the vicinity, the impact of the loss of this space is likely to be small.

Federal, State and Local Governmental Agencies

Federal, State, and local governments will continue to comply with their jurisdictional responsibilities. However, due to the increased interest in renewable energy development in the United States, and federal and state regulations requiring the development and use of renewable energy, agencies affected by renewable development will adopt policies and procedures for addressing impacts of the construction and operation of these facilities.

4.9.1.4 Economy and Employment

Economic impacts for the proposed Project were estimated using a Nye County Impact Analysis for Planning (IMPLAN) economic impact model. IMPLAN is a commonly used analytical software tool to estimate socioeconomic impacts originally developed by researchers at the USFS. The model is owned and administered by the Minnesota IMPLAN Group, Inc. The IMPLAN software is an input-output based model that describes the inter-industry relationships between industries and commodity purchases within a local economy. The model relies on county and state-level data sets that are continually updated by the United States government and by Minnesota IMPLAN Group, Inc. IMPLAN is used to measure the multiplier impacts or total economic impacts associated with a given project's spending relationships or linkages to a region's vendors, suppliers, households, and government entities. A multiplier describes the response of the regional economy to a stimulus (e.g., construction period spending associated with a project's local capital expenditures and payroll) that is a change in final demand. The multiplier process represents the predictive part of the model. The model supplements the traditional input-output framework with a social accounting matrix that takes into account non-industrial transactions such as the payment of taxes by businesses and households.

Economic impacts are defined as total expenditures, personal income, and employment. Total impacts are estimated using the following components:

- ***Direct Impacts*** – Represents the impacts for the expenditures and/or production values specified as direct final demand changes.
- ***Indirect Effects*** – Represents the impacts caused by the iteration of industries purchasing from industries and local businesses resulting from direct final demand changes.
- ***Induced Effects*** – Represents the impacts caused by the iteration of households purchasing from industries and local businesses resulting from direct final demand changes.
- ***Total Impact*** – The total impact is the sum of the direct, indirect, and induced effects.

Two phases of impacts are considered that have different levels of impacts on the ROI. Phase One is the construction of the Project and is projected to last 39 months; this is considered a short-term impact that does not have any long-term economic sustainability. Phase Two is the annual operations of the Project that will provide the ongoing economic sustainability and have positive economic impacts on the ROI for several years. Description of each phase and economic impacts will be discussed in the following sections.

Phase One – Construction Activity

Phase One includes the construction of two 250 MW plants for a total of 500 MW. This phase is projected to last 39 months. During the construction period, communities in the ROI will experience temporary increases in the levels of overall economic activity through the purchases of goods and services, employment, and personal income. Also during this period, Nye County will experience an increase in property and sales tax collections. The following section will describe the levels of projected increased activities during construction.

Purchases

Construction of both plants is estimated to cost between $2.5 and $3.0 billion. The main components of construction costs include labor, materials, equipment, supplies and taxes. Due to the confidentiality of detailed component construction cost estimates, only total estimated construction costs are reported. However, the detailed construction cost estimates by type and place of purchases is integrated in the Nye County IMPLAN economic model. In addition, it is assumed that during the construction phase all attempts will be made to purchase local labor and supplies when available. The components that will be difficult to purchase locally are specialized solar equipment, power plant equipment, and transmission facilities that are only available in other markets. Increased local business activity and revenues are projected to come from the purchases of water, sand and gravel, cement, electricity, propane, building materials, equipment rentals, miscellaneous construction supplies and sales taxes. It is estimated that approximately $50 to $75 million of supplies and materials will be purchased from local businesses over the 39 month period.

Employment

Amargosa Valley has a relatively small workforce; however adjacent communities of Beatty and Pahrump will also be a local source for construction employment. Solar Millennium will make all attempts to hire local residents that meet required job qualifications. In addition, Clark County will likely be a recruiting base for all types of specialty construction employment, especially under current economic conditions and high levels of construction worker unemployment in the State of Nevada.

Table 4-27 reports the average projected monthly skilled construction employment over the 39-month construction period. A total of 23 construction skill trades will be required to complete the Project. The greatest job activity occurs between months 14 and 23, with more than 1,000 active construction jobs each month. In month 16 construction jobs peak at 1,318. The monthly average construction employment over the 39-month period is 634 jobs.

Table 4-27 Construction Workforce by Skill (Monthly)

Trade or Skill	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19
Surveyor	0	16	12	12	16	18	17	21	21	18	20	20	25	24	18	17	14	10	12
Operator	25	51	56	58	64	92	92	97	97	97	97	97	115	107	104	104	104	104	104
Laborer	14	36	37	39	69	91	69	156	190	230	230	230	230	230	230	213	213	213	213
Truck Driver	21	17	15	16	28	30	35	44	44	36	32	29	39	40	40	40	38	38	38
Oiler	1	5	3	2	3	3	3	5	5	3	5	3	7	7	6	5	3	2	2
Carpenter	0	6	20	23	22	30	23	81	92	92	104	104	104	115	115	115	115	115	115
Boilermaker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	13	13	13
Paving Crew	-	-	-	-	6	6	-	5	-	-	-	-	5	-	-	-	-	-	-
Pipe Fitter	-	1	14	16	12	14	13	16	32	58	115	115	167	173	190	307	375	352	340
Electrician	-	0	6	12	12	13	13	18	25	28	43	52	68	108	150	169	173	173	173
Cement Finisher	-	3	14	16	15	22	17	24	44	92	92	92	92	115	115	115	115	115	115
Ironworker	-	5	12	12	12	29	29	29	48	48	48	68	68	68	68	68	68	68	68
Millwright	-	-	-	-	-	-	-	-	-	-	23	23	23	23	23	29	29	29	29
Tradesman	-	14	49	58	59	85	67	52	31	29	14	9	9	12	9	15	12	3	2
Project Manager	1	1	1	1	1	1	1	3	3	3	3	3	3	3	2	3	3	3	3
Construction Manager	1	1	1	1	1	1	1	3	3	3	3	3	3	3	2	3	3	3	3
PM Assistant	1	1	1	1	1	1	1	3	3	5	5	5	5	5	5	5	5	5	5
Support	1	1	1	1	1	1	1	3	3	5	5	5	5	5	5	5	5	5	5
Support Assistant	1	1	1	1	1	1	1	3	3	5	5	5	5	5	5	5	5	5	5
Engineer	3	3	2	3	3	3	3	10	10	9	12	12	12	12	12	12	12	14	14
Timekeeper	1	1	1	1	1	1	1	3	3	3	3	3	3	3	2	3	3	3	3
Administrator	2	2	2	2	2	2	2	7	7	7	7	7	7	7	7	7	7	7	7
Welder	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total	**73**	**166**	**249**	**276**	**330**	**445**	**390**	**584**	**665**	**772**	**867**	**886**	**996**	**1066**	**1109**	**1254**	**1318**	**1281**	**1270**

Table 4-27 Construction Workforce by Skill (Monthly) Cont.

Trade or Skill	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38	M39	Avg
Surveyor	13	16	14	18	16	16	8	1	3	3	1	-	-	2	3	3	3	3	-	-	11.1
Operator	104	84	81	74	74	64	47	17	10	9	5	2	2	6	8	8	8	8	2	-	58.4
Laborer	183	143	143	116	97	97	97	68	68	49	49	40	35	29	29	25	17	12	6	-	106.0
Truck Driver	38	30	29	29	26	26	18	18	17	17	17	14	14	14	12	12	6	6	3	-	24.8
Oiler	3	5	3	5	5	5	3	1	1	1	0	-	-	1	1	1	1	1	-	-	2.8
Carpenter	115	115	115	115	92	92	92	81	58	58	46	12	12	12	6	6	-	-	-	-	62.0
Boilermaker	13	13	13	13	13	13	13	13	-	-	-	-	-	-	-	-	-	-	-	-	4.0
Paving Crew	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6
Pipe Fitter	328	315	315	315	315	288	288	282	230	196	115	89	68	12	12	12	6	6	6	-	141.2
Electrician	162	162	146	146	129	129	62	62	52	52	41	10	10	10	6	6	6	6	6	-	62.5
Cement Finisher	115	115	92	92	92	92	92	92	81	81	81	63	29	23	12	12	-	-	-	-	60.9
Ironworker	68	68	68	49	49	23	23	23	23	23	12	12	12	12	12	12	6	6	6	-	33.9
Millwright	29	29	29	29	29	17	17	17	17	12	12	12	12	12	12	12	-	-	-	-	13.5
Tradesman	2	2	2	2	2	5	5	3	-	-	-	-	-	-	-	-	-	-	-	-	14.2
Project Manager	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	1	2.5
Construction Manager	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	1	2.5
PM Assistant	5	5	5	5	5	5	5	5	5	5	5	5	3	3	3	3	3	3	3	1	3.7
Support	5	5	5	5	5	5	5	5	5	5	5	5	3	3	3	3	3	3	3	1	3.7
Support Assistant	5	5	5	5	5	5	5	5	5	5	5	5	3	3	3	3	3	3	3	1	3.7
Engineer	14	14	14	14	14	14	14	14	14	14	10	10	10	9	10	10	9	10	9	5	9.9
Timekeeper	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	1	2.5
Administrator	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	6	2	5.8
Welder	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1.0
Total	**1219**	**1143**	**1096**	**1049**	**985**	**913**	**811**	**721**	**606**	**547**	**421**	**296**	**230**	**167**	**149**	**145**	**87**	**89**	**63**	**13**	**634**

Table 4-28 Nye County Prevailing Wage by Construction Occupation

Trade or Skill	Nye County Prevailing Wage*
Surveyor	$42.14
Operator	$53.92 – $58.77
Laborer	$42.94 – $45.96
Truck Driver	$46.13 – $48.12
Oiler	$57.60
Carpenter	$48.70 – $55.24
Boilermaker	$59.50
Paving Crew	$42.94 – $56.98
Pipe Fitter	$34.28
Electrician	$34.82 – $63.62
Cement Finisher	$46.28 – $50.03
Ironworker	$56.74 – $63.40
Millwright	$49.70 – $56.65
Tradesman	$40.00 – $50.00**
Project Manager	$50.00 – $60.00**
Construction Manager	$45.00 – $55.00**
PM Assistant	$25.00 – $35.00**
Support	$25.00 – $30.00**
Support Assistant	$20.00 – $25.00**
Engineer	$40.00 – $50.00**
Timekeeper	$15.00 – $20.00**
Administrator	$25.00 – $30.00**
Welder	$49.70 – $58.20

*Does not include benefits.

** Trade or skill not listed in the Nevada Office of Labor Commissioner Rate Sheet. Information provided by Solar Millennium.

Source: Nevada Office of the Labor Commissioner 2010

Personal Income

During construction, communities in the ROI are expected to have positive, short-term effect on employee earnings and personal incomes. Total earnings corresponding to the employment levels reported in Table 4-27 are estimated using the 2010 Nye County prevailing wage rate by construction occupation (Table 4-28). The average non-benefited wage for the construction of

the Project is $43.30. Overall it is estimated that Project construction will provide over $190 million of direct personal income over the full 39-month construction period. These rates do not include benefits which normally could add another 30 to 40 percent to the full compensation package.

Construction Scenarios

Four construction scenarios were considered using different levels of locally hired employment and locally earned wages. Analyzing different local employment and income levels is important, because the availability of types of skilled labor may require hiring from outside Nye County. Nonresident employment and incomes will have minimal impacts on Nye County.

Local is defined as coming from within Nye County. Although each scenario needs to be considered, hiring 50 percent locally seems to be very realistic given the current economic conditions. For example, Southern Nye County, specifically Pahrump, continues to experience high levels of local residents commuting to Clark County for work, estimated at 20 to 25 percent of residents who work. Several factors contribute to this result, but the main reason is the lack of local employment opportunities; so an increase in employment opportunities locally could result in more residents receiving employment in Nye County and reduce the exporting of Nye County's workforce. Given the temporary nature of the construction phase jobs, residents may be hesitant to leave a permanent job in Clark County for a temporary job in Nye County. However, considering on-the-job training provided by Solar Millennium and the availability of solar job training courses offered by Great Basin College in Pahrump, local construction workers may be inclined to pursue permanent employment during Project operations. Table 4-29 summarizes the average monthly construction scenarios over the total 39 months.

Table 4-29 Average Monthly Construction Employment and Personal Income Scenarios (39 Months)

Scenario	Employment	Personal Income
100% Hire Local	634.0	$4,884,997
75% Hire Local	475.5	$3,663,744
50% Hire Local	317.0	$2,442,496
25% Hire Local	158.5	$1,221,248

Under the 50 percent scenario, a total of 317 employees will be hired from within Nye County, while the remainder of required employment will likely come from the Las Vegas market and will not take on permanent Nye County residency. Non-local workers will provide a small temporary stimulus to the Nye County economy as they spend per diem money on hotels, meals, and consumables. However, unlike the local workers who permanently reside in Nye County, non-local workers would be expected to spend most of their earning outside of the region. Some direct spending generated from local workers would also be expected to leak out of the region, as the total regional demand for goods and services could not be entirely satisfied from local (i.e., Nye County) production.

Phase Two – Annual Operations Activity

At the conclusion of the construction phase, communities in the ROI will realize a new level of sustainable economic impacts through annual operations. Annual operations for both plants will require consistent purchases of labor, supplies, materials, services, and payment of federal, state, and local taxes. Table 4-30 summarizes the direct economic projections for the annual operations.

Input Purchases

Annually it is projected that the Project will spend $16 to $18 million on materials and supplies to operate both plants. Similar to the construction phase, there is a strong commitment to purchases labor, supplies, materials, and services from local sources and businesses. Specifically, the majority of water, propane, gasoline, and electricity will come from businesses located in Nye County. Additionally it is not unusual for new supportive businesses and industries to be created to support annual operations. Projected revenues are difficult to estimate at this time because of market fluctuations.

Employment

Permanent annual full-time employment at both plants is estimated to be between 170 and 200 full-time employees. With the permanent nature and sustainability of these positions, it is assumed that a minimum of 75 percent of the workforce will be from local communities in Nye County (i.e., Amargosa Valley, Beatty, and Pahrump). The remaining 25 percent of employees will more than likely come from Clark County or Las Vegas. Currently it is estimated by the Bureau of Census Journey to Work data that nearly 23 percent of Nye County residents works outside Nye County (U.S. Census 2010). Much of the outward-migration of workers from Nye County is due to the fact that few employment opportunities exist, and with the construction of the Project more employment opportunities will be available for local workers.

Personal Income

According to Solar Millennium, permanent full-time employment wages and salaries at both plants are estimated to be $8.6 to $9.9 million annually. Solar Millennium estimates that the annual wages and salaries per job will average $50,000, which is near or well above current average wages for most of the communities in the ROI.

Table 4-30 Summary Annual Operations for the Project

	Amount	Local (Nye County)
Input Purchases	$16 to $18 million	30%
Employment	170 to 200 Full-Time	75%
Personal Income	$8.6 to $9.9 million	75%

4.9.1.5 Economic Impacts

Economic impacts are defined as the economic activity, employment, and personal income. Both phases, construction and annual operations, are estimated and presented below.

Phase One – Construction Economic Impacts

Table 4-31 through Table 4-33 summarize the total economic impacts for the construction phase of the Project based on the IMPLAN model. Summary results include:

Direct Expenditure Impact Assumptions & Results:

- Total construction expenditures over 39 months are estimated at $2.5 to $3.0 billion.
- Approximately $50 to $75 million of supplies and materials will be purchased from local businesses during construction phase.
- An expenditure multiplier of 1.27 is estimated for direct expenditures in Nye County. That is for every $1 spent locally another $0.27 is generated in Nye County.

Table 4-31 Total Direct Local Expenditure Impacts over 39-Month Contruction Period

Direct Local Expenditure Activity	Indirect Expenditure Impact	Induced Expenditure Impact	Total Expenditure Impact	Expenditure Multiplier
$50,000,000	$7,709,127	$5,931,866	$63,640,992	1.27
$75,000,000	$11,563,691	$8,897,800	$95,461,488	

Direct Average Monthly Employment Impact Assumptions & Results:

- Total construction employment over 39 months varied each month from a high of 1,318 employees in month 17, to 13 employees in month 39.
- Total employment impacts were estimated for each month of construction (see Figure 4-5).
- Average monthly direct employment impacts were estimated at 634 employees over 39 months.
- Four employment scenarios were considered based on the estimated percentage of employees that would be hired from within Nye County.
- The preferred scenario for the construction phase was that 50 percent of hired labor would come from Nye County.

- An employment multiplier of 1.32 was estimated for direct construction employment. This means that for every one locally hired construction job for the Project, another 0.32 jobs will be supported in Nye County.

Table 4-32 Average Monthly Employment Impacts over 39-Month Construction Period

Scenarios	Direct Employment Impact	Indirect Employment Impact	Induced Employment Impact	Total Employment Impact	Employment Multiplier
100% Local Hire	634	113	90	837	1.32
75% Local Hire	475	84	67	628	
50% Local Hire	317	56	45	418	
25% Local Hire	158	28	22	209	

Direct Average Monthly Personal Income Impact Assumptions & Results:

- Total construction personal income over 39 months varied each month from a high of $10 million in month 17, to $96,000 in month 39.
- Total personal income impacts were estimated for each month of construction (see Figure 4-6).
- Average monthly direct personal income impacts were estimated at $4,883,151 over 39 months.
- Four personal income scenarios were considered based on the estimated percentage of employees and their corresponding wages and salaries that would be hired from within Nye County.
- The preferred scenario for the construction phase was that 50 percent of hired labor would come from Nye County and corresponding wages and salaries would stay in Nye County.
    - A personal income multiplier of 1.38 was estimated for direct construction personal income. This means that for every $1.00 earned locally from Project construction, an additional $0.38 of income is generated in Nye County.

Table 4-33 Average Monthly Personal Income Impacts over 39-Month Construction Period

Scenarios	Direct Employment Impact	Indirect Employment Impact	Induced Employment Impact	Total Employment Impact	Employment Multiplier
100% Local Hire	$4,883,151	$1,395,721	$442,112	$6,722,899	1.38
75% Local Hire	$3,662,363	$1,046,790	$331,584	$5,042,174	
50% Local Hire	$2,441,575	$697,860	$221,056	$3,361,449	
25% Local Hire	$1,220,787	$348,930	$110,528	$1,680,725	

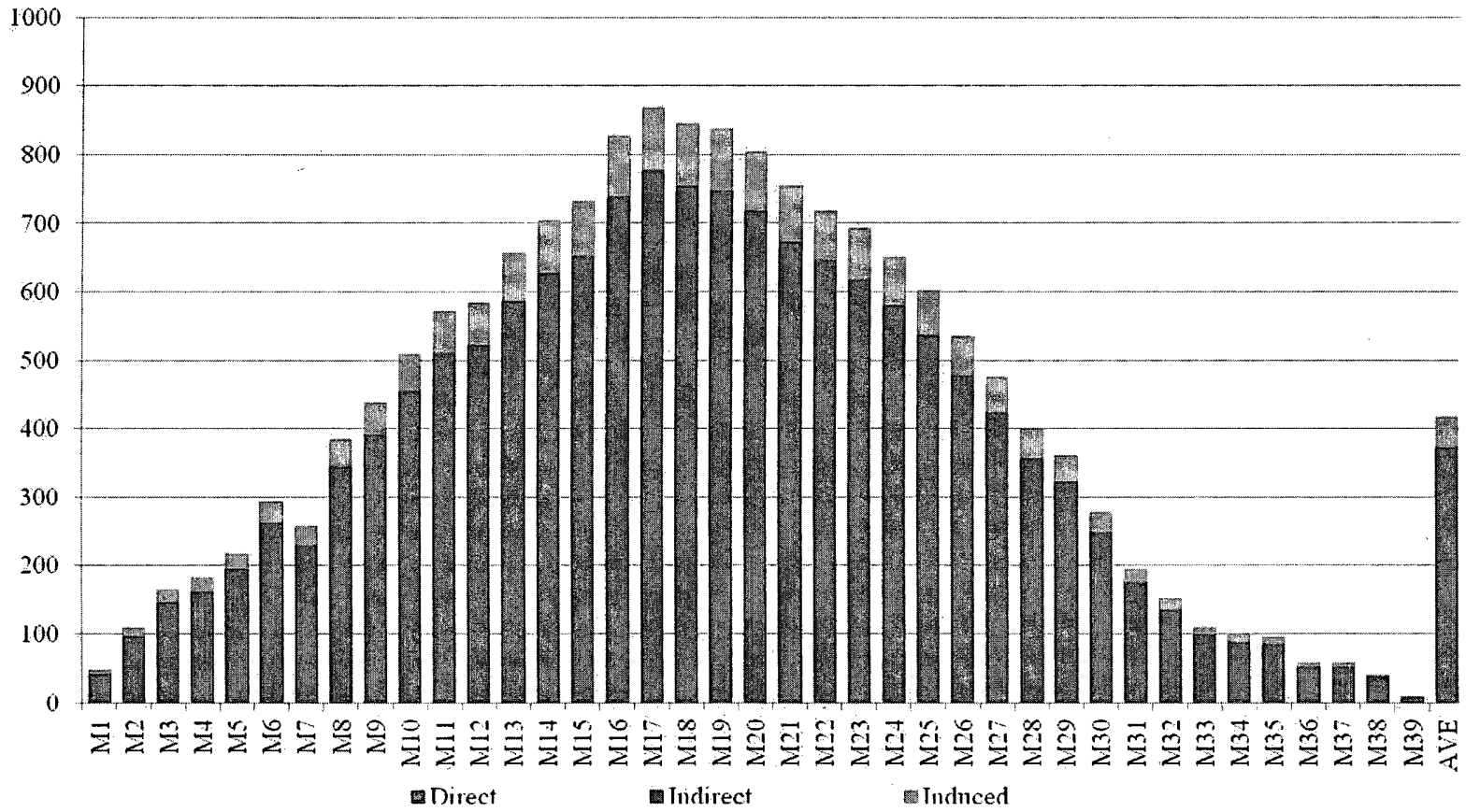


Figure 4-5 Employment Impacts from the Construction Phase of the Project on Nye County (50% Nye County Hire)

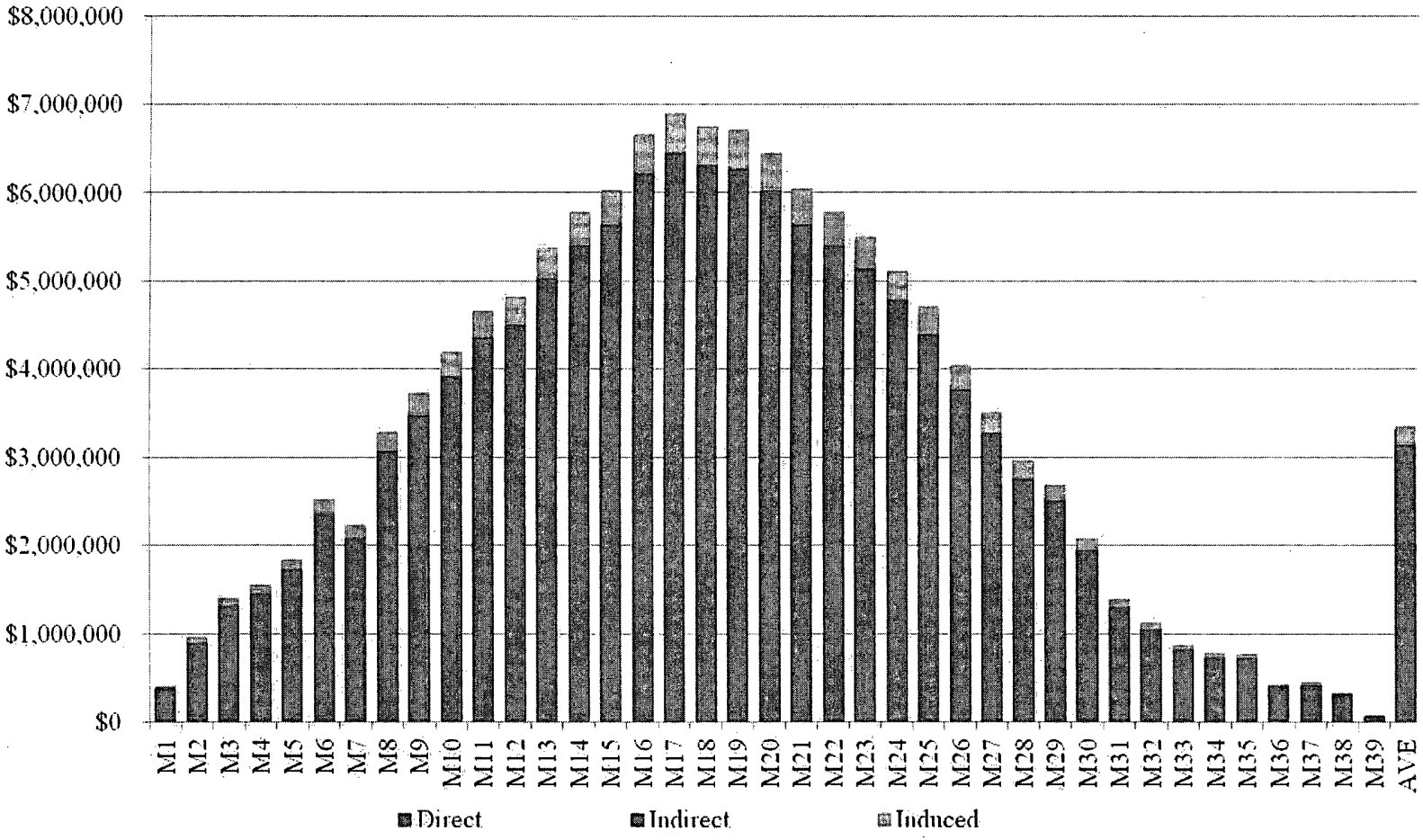


Figure 4-6 Personal Income Impacts from the Construction Phase of the Project on Nye County (50% Nye County Hire)

Under each employment and personal income scenario, the following sectors reported the greatest impacted sectors (Table 4-34). With this type of project, these sectors could be further developed and expanded to meet newly created demand.

Table 4-34 Top Nye County Impacted Sectors from Construction Phase of the Project

NAICS Sector	Description
23	Construction of other nonresidential structures
5413	Architectural, engineering, and related services
531	Real Estate Services
722	Food Service and Drinking Places
452	Retail – General Merchandise
8111	Automotive repair and maintenance, except car washes
6211	Offices of physicians, dentists, and other health practitioners
8113	Commercial and industrial machinery and equipment repair and maintenance
454	Retail Nonstore – direct and electronic stores
441	Retail – motor vehicle parts

Phase Two – Annual Operations Economic Impacts

Table 4-35 and Table 4-36 summarize the total economic impacts for the operational phase of the Project. Summary results include:

Direct Annual Employment Impact Assumptions & Results:

- Total annual operations employment is estimated at between 170 and 200 employees; analysis is conducted on estimated average 185 direct annual employees.
- Assumed 75 percent of employment would be from Nye County.
- An employment multiplier of 1.48 is estimated for direct annual operations; this means that every direct job will support an additional 0.48 precent of a job throughout Nye County.

Table 4-35 Average Annual Employment Impacts for Project Annual Operations

Scenarios	Direct Employment Impact	Indirect Employment Impact	Induced Employment Impact	Total Employment Impact	Employment Multiplier
100% Local Hire	185	23.7	65.1	273.8	1.48
75% Local Hire	139	17.8	48.8	205.6	

Direct Annual Personal Income Impact Assumptions & Results:

- Total annual personal income is estimated between $8.6 and $9.9 million. Analysis is conducted on $9.1 total annual income.
- Assumed 75 percent of total personal income will be paid to Nye County residents.
- A personal income multiplier of 1.19 is estimated for direct personal income; this means that for every direct dollar earned locally from the Project, an additional 0.19 of personal income will be generated in Nye County.

Table 4-36 Average Annual Personal Income Impacts for Project Annual Operations

Scenarios	Direct Employment Impact	Indirect Employment Impact	Induced Employment Impact	Total Employment Impact	Employment Multiplier
100% Local Hire	$9,101,408	$1,013,024	$711,948	$10,826,380	1.19
75% Local Hire	$6,826,056	$759,768	$533,961	$8,119,785	

4.9.1.6 Public Services

The Proponent has entered into a Development Agreement with Nye County in which it has agreed to the following to help mitigate any increase in demand on local emergency services (Nye County 2010):

- Annually provide emergency and fire protection training for up to four individuals identified by Nye County, with priority given to individuals who serve in the Amargosa Valley Volunteer Fire Department. This training will be equivalent to the training provided to the Proponent's on-site personnel. Training will be compliant with the guidelines of the National Fire Protection Agency standards as it relates to structures, materials, and hazards present on-site and wildlands adjacent to the proposed Project site.
- Annually pay $20,000 to the county for use in providing police services in the Town of Amargosa.
- Provide a water supply for the County's use in responding to fires within the Town of Amargosa.
- Annually pay $20,000 for the County's use in providing staff and equipment for the Town of Amargosa medical clinic.

These agreements will become effective 60 days after the Proponent obtains financing for construction and will be in effect for the term of the Development Agreement.

Construction

The proposed Project will rely on both on-site security and the Nye County Sheriff's Department law enforcement protection services during construction. Site guards will be trained, uniformed,

unarmed personnel. Their primary responsibility will be to control egress and ingress of personnel and vehicles, perform fire and security watch during off hours, and perform security badge administration. A Project-wide photo security badge system for all construction and operations personnel will be used to control security. The perimeter of the Project site will be fenced with an 8-foot-high security fence with barbed or razor wire on the north and south side of the Project, and a 30-foot-high security wind fence on the east and west sides of the Project.

As described in Section 2.3.9, the proposed Project will rely on both on-site fire protection systems and as needed, local (e.g., Amargosa Valley Volunteer Fire Department) fire protection services during construction. The Amargosa Valley Volunteer Fire Department Station is located at 851 E. Amargosa Farm Road, which is approximately 1.3 miles from the southeast corner of the solar field. If needed, mutual aid would be provided by the Pahrump, Beatty, and Mercury fire departments. A Construction Fire Protection and Prevention Plan will be developed and followed throughout all phases of construction. During construction, the permanent facility fire suppression system will be placed in service as early as practicable. Prior to installation of the facilities, permanent fire suppression system, fire extinguishers, and other portable firefighting equipment will be available on-site.

Operations

Project operation may increase demands on local police, fire, medical, and other emergency services. However, population in-migration into the Amargosa Valley, Pahrump, and Beatty as result of the proposed Project is expected to be minimal. The modest size workforce would not be expected to have an adverse impact on demand relative to the capacity of most local public services.

Services provided by the Nye County Sheriff's Department and the Amargosa Valley Volunteer Fire Department could be augmented by emergency services in Pahrump and Clark County, if requested; however, there would be a significant delay in response from these emergency services. Project health and safety programs and fire protection systems and procedures would be expected to help reduce the need for fire, medical, and other emergency services.

4.9.1.7 Utilities

Construction

Although minimal population impacts are expected, there would be some demands on existing utility services during construction as a result of on-site activities. Water needed for construction would be obtained from a well located southwest of the Project area. Potable water would be brought in and stored in approved water tanks. Sanitary wastes generated during construction will be collected in portable, self-contained toilets and hauled to an approved disposal site.

Operations

The proposed Project would utilize approximately 400 afy of existing groundwater currently being used for agriculture; thus, it would not impact local water supplies nor increase basin usage

and represents less than 2 percent of the total perennial yield of the Amargosa Basin. Project sanitary wastes would be disposed of by an on-site septic system and leach field. Operations of the proposed Project would not impact available electrical needs; and by its very nature, would represent a net gain in regional capacity.

4.9.1.8 Schools

Construction

Since it is anticipated that the majority of construction workers would commute, rather than relocate, construction of the proposed Project is not expected to increase enrollment in area schools. Furthermore, construction workers who relocate temporarily for a work assignment typically do not bring their families with them.

The Amargosa School, a combined elementary and middle school, is within 1 mile of the Project site and had a 2009 enrollment of 194 students. High school age students in Amargosa Valley attend Beatty High School which has a 2009 enrollment of 139. The Nye County School District is currently negotiating with the BLM to acquire 20 to 30 acres for a new school site in Amargosa Valley (Amargosa Area Plan 2009). Potential impacts during construction include increased traffic along Amargosa Farm Road, fugitive dust from construction activities, and increased noise. Construction activities will normally occur during daylight hours between sunrise and sunset.

All construction traffic will be off of Valley View Boulevard to the Project site. Some residual increase in traffic along Amargosa Farm Road is anticipated, depending on the commuting route of the construction worker. As part of the Development Agreement between Nye County and the Proponent, the Proponent is required to conduct a Master Traffic Impact Analysis prior to commencement of construction. The traffic study must be submitted and approved by Nye County. The Proponent will improve Valley View Boulevard in accordance with the approved Master Traffic Impact Analysis.

Fugitive dust must be controlled per requirements of the SAD Permit and the SWPPP. Implementation of BMPs to control dust will minimize fugitive dust impacts. Mitigation measures to control dust and noise impacts are described in Appendices A.1, A.3, and A.5.

Operations

Operation of the proposed Project is expected to have minor local and regional effects on schools because of the relatively small number of workers needed for operation of the plant (estimated average of 185 employees).

4.9.1.9 Fiscal Resources

Construction

Total expenditures for the proposed Project within the ROI and outside the ROI on construction materials, supplies, and equipment over the 39-month construction period is estimated to be approximately $1.8 billion.

Pursuant to Nevada law Assembly Bill 522, approved renewable energy projects are only required to pay sales and use tax at the rate of 2.25 percent, which is allocated in the same manner as other taxes collected under the Local School Support Tax. Over the 39-month construction period, the Project would pay approximately $35 million in sales tax to the State of Nevada for the Local School Support Tax (Table 4-37).

In addition to sales tax revenue, the proposed Project would generate for Nye County up to $30 million in property taxes during construction, after taking into account the 55 percent property tax abatement for renewable energy projects under Assembly Bill 522 (Table 4-37).

Table 4-37 Total Property and Sales Tax Revenue from Project Construction (over 39 months)

	Dispersal Percentage*	Estimated Payment/Income*
Property Tax Dispersal		
State of Nevada	45.00%	$13,545,000
Nye County	20.24%	$6,092,240
Nye County School District	20.075%	$6,042,575
Amargosa Town Fund	12.10%	$3,642,100
State Capital Debt and Parks	2.585%	$788,085
Total Property Tax	**100.00%**	**$30,080,000**
Sales Tax Dispersal**		
Local School Support Tax Fund	100.00%	$35,200,000

*Based on personal property, real property, and land value during construction. Estimated payment based on a total estimated value of $2.6 billion.

**Based on purchases of $1.8 billion of equipment, materials, and supplies over 39-month period at a 2.25% abatement rate.

Operations

During operation, it is expected that the annual purchases for materials, supplies, equipment, and services within the ROI would total approximately $17 million. As part of the Development Agreement signed with Nye County, the Proponent has agreed to make a good faith effort to purchase a reasonable amount of goods related to operations from Nye County vendors. The Proponent has also agreed to conduct annual vendor information sessions in Nye County to help educate local vendors on the Proponent's procurement process (Nye County 2010). In the event

that all purchases are made within Nye County, which has a tax rate of 7.1 percent, these expenditures would generate approximately $1.2 million in annual sales tax revenue. In addition, using an estimated property value of $2.6 billion during the first year of operation, the Project would generate approximately $13.9 million in property tax revenue (Table 4-38).

Table 4-38 Total Property and Sales Tax Revenue from Project Operation (Year 1 or 12 Months)

	Dispersal Percentage*	Estimated Payment/Income*
Property Tax Dispersal		
State of Nevada	45.00%	$6,255,000
Nye County	20.24%	$2,813,360
Nye County School District	20.075%	$2,790,425
Amargosa Town Fund	12.10%	$1,681,900
State Capital Debt and Parks	2.585%	$359,315
Total Property Tax	**100.00%**	**$13,900,000**
Sales Tax Dispersal**		
State General Fund	2.0%	$336,000
Nye County School District	2.6%	$444,000
Nye County	0.5%	$84,000
Nye County Transportation & Air Quality	0.25%	$48,000
Supplemental City-County Relief Tax	1.75%	$300,000
Total Property Tax	**7.1%**	**$1,212,000**

*Based on personal property, real property, and land value during construction. Estimated payment based on a total estimated value of $2.6 billion.

**Based on purchases of $17.0 million of equipment, materials, and supplies over 39-month period at a 2.25% abatement rate.

4.9.2 Wet-Cooled Alternative

Impacts to socioeconomic resources from construction and operation of a wet-cooled solar plant would be similar to the impacts described for the Proposed Action (dry-cooled alternative). Those affected groups with concerns about water conservation would experience a more negative impact when compared to the Proposed Action – dry-cooled alternative.

The principal indirect impact to socioeconomic resources under the wet-cooled alternative would be from groundwater stipulations mandated by the NPS, USFWS, and BLM to acquire additional water rights above and beyond those needed for Project construction and operation. Since up to

4,600 afy is required for operation of a wet-cooled plant, it is likely that the agencies would require the Proponent acquire several thousand acre-feet of additional water to offset potential effects to sensitive resources at Ash Meadows NWR and Devils Hole. This action would result in the reduction of groundwater pumping in the Amargosa Desert Hydrographic Basin and the fallowing of large parcels of active farmland in the Amargosa Valley. Farming revenue in Amargosa Valley would be reduced; however, this lost revenue would be offset by wages and indirect economic stimulus provided by the construction and operation of the proposed Project.

4.9.3 No Action Alternative

Under the No Action Alternative, the BLM would not grant a right-of-way to the Proponent. The BLM land on which the Project is proposed would continue to be managed within the BLM's framework of a program of multiple use and sustained yield, and the maintenance of environmental quality (43 USC 1781 (b)) in conformance with applicable statutes, regulations, policy, and land use plan.

The results of the No Project/No Action Alternative would be the following:

- The impacts of the proposed Project would not occur; however, the land on which the Project is proposed would become available to other uses that are consistent with the BLM's land use plan, possibly including another renewable energy project.
- The benefits of the proposed Project in reducing greenhouse gas emissions from gas-fired generation would not occur; both state and federal law support the increased use of renewable power generation.

If the proposed Project were not approved, renewable projects would likely be developed on other sites in the Mojave Desert or in adjacent states as developers strive to provide renewable power that complies with utility requirements and state/federal mandates.

4.9.4 Mitigation

No mitigation is required.

4.10 ENVIRONMENTAL JUSTICE

Information about the proportion of population that may be impacted by the alternatives and are characterized as minority and/or low-income is provided in Section 3.10. Overall, the data show that there is a slightly higher proportion of Hispanic residents in the Amargosa Valley, and there are higher proportions of low-income populations in the Amargosa Valley compared to the overall population in Nye County and Las Vegas.

4.10.1 Proposed Action

Income and revenue benefits associated with the proposed Project would be distributed throughout all areas, including EJ populations. Adverse impacts associated with the proposed Project would not likely be experienced disproportionately by an EJ population.

There are no special issues, such as housing, transportation access, or resource use in the Project area that would affect the EJ population disproportionately.

4.10.2 Wet-Cooled Alternative

Impacts to EJ from construction and operation of a wet-cooled solar plant would be similar to the impacts described for the Proposed Action (dry-cooled alternative).

4.10.3 No Action Alternative

Under the No Action Alternative, the right-of-way would not be granted. No Project-associated impacts would occur to minority or low-income populations under the No Action Alternative.

4.10.4 Mitigation

No mitigation is required.

4.11 LAND USE, RECREATION, TRANSPORTATION, AND ACCESS

The following section describes the potential impacts of construction and operation of the proposed Project on land use, recreation, and transportation and access within their respective ROI, as defined in Chapter 3. The impact analysis for these areas is based on review of the existing conditions and focuses on the following issues: the conformity of the proposed Project with federal and local land use plans, ordinances, and policies; and the potential for the Project to have direct and/or indirect land use, recreation, transportation, and access conflicts with existing and planned uses.

4.11.1 Proposed Action

All public land, unless otherwise classified as ACEC or Wilderness Study Area, are available for land use rights-of-way, leases, and other decisions under Section 302 of the FLPMA. Land use must be consistent with other resource management objects, while considering local land uses. The BLM's evaluation of the Proponent's right-of-way application considered not only the Projects conformance with adopted management objectives and directions as summarized in the Las Vegas RMP/EIS, but also local planning guidelines (Amargosa Valley Area Plan) and comments from stakeholders and the public.

4.11.1.1 Existing Land Use

The requested right-of-way is located on primarily undisturbed BLM desert lands designated for disposal in the Las Vegas RMP/EIS. The Project area is adjacent to a low density residential area east of Sandy Lane. Smaller rural residential areas are located west of the Project area. No residential, commercial, industrial, or institutional uses are located within the Project area. The

nearest school is approximately 1 mile east of the the Project area. The proposed Project will have long-term direct impacts on potential uses of BLM land within the Project area by removing public land available for disposal and dispersed recreation. Under the Proposed Action, approximately 6,320 fewer acres (the requested acreage under the Applicants right-of-way application) would be available for BLM disposal for other federal actions, and up to 4,350 acres of existing desert land will be converted to utility/industrial use. Construction and operation of the proposed Project would restrict multiple use opportunities on the Project site to a single dominant use. Multiple use opportunities could be available after decommissioning.

4.11.1.2 Future Land Use

The Project area is located within an area designated by the Amargosa Valley Area Plan as a Special Development Area. The term "Special Development Area" is a mixed-use designation to set aside public or private areas where a variety of land uses might be proposed for approval, including projects under review by the BLM, such as Solar Energy Facilities (Amargosa Valley Area Plan Committee 2009).

Impacts to future land use include the change of land use identified by the Amargosa Valley Area Plan from future residential use south of Amargosa Farm Road, and east of Powerline Road to utility use. However, the Project is consistent with the policies, goals, objectives and land use descriptions set forth in the Amargosa Valley Area Plan as the designated Special Development Area permits the uses contemplated.

4.11.1.3 Transportation and Access

The construction of the proposed Project would have short-term direct impacts to the existing traffic load on existing roadways within the ROI. There would be an increase in vehicular traffic in relation to the existing traffic load and capacity of the street system. During construction of the proposed Project, the majority of workers are expected to commute from Las Vegas within Clark County, resulting in a direct increase in average daily traffic on US 95. Construction workers will commute as much as 2 hours to construction sites from their homes. Normal construction hours are expected to be between 6 a.m. and 6 p.m., Monday through Friday, depending on the time of year. Some activities may require extended evening construction hours and weekend work, as necessary, to meet the overall Project schedule.

During construction, access to the Project site will be from Amargosa Farm Road via Valley View Boulevard. As stipulated in the Nye County Development Agreement (Appendix F), prior to commencement of construction, the Proponent will submit a Master Traffic Impact Analysis for review and approval by the County. This analysis will build upon the analysis contained in the Final EIS, and will address impacts, if any, of the transportation of employees to and from the Project site. The Proponent will provide improvements required in the approved Master Traffic Impact Analysis in order to mitigate the land use impacts of the Project. Any work to public roads will be done in accordance with Nye County Public Works standards and the appropriate permits will be obtained from NDOT. As a part of the proposed Project, a portion of Amargosa Farm Road would be realigned. The proposed roadway alignment would be coordinated with Nye County Public Works and be constructed in conformance with the current standards. The locations of the principal site entry gates for both the construction and the

commercial operating period would be evaluated in consultation with the BLM, NDOT, and Nye County Public Works to ensure ingress and egress from the site do not have adverse impacts on existing traffic flow patterns.

The average construction workforce is estimated at 650 individuals per day, resulting in an increase of approximately 1,300 average daily vehicle trips on US 95 or NV 373 if each worker drove alone to and from the Project site. Peak workforce levels are estimated at 1,300 individuals per day, resulting in an increase of approximately 2,600 average daily vehicle trips on US 95 if each worker drove alone to and from the Project site.

Traffic levels are expected to peak during month 17 of the 39-month construction period. Where the construction workers currently reside would determine patterns of traffic increase. Other roads in the vicinity of the Project area could potentially see increased traffic from workers travelling to and from the Project site to area services and other work-related activities.

The proposed Project is expected to employ a estimated average of 185 full-time workers during operation, or an estimated increase of 370 daily vehicle trips on US 95, if each work drove alone to and from the Project site.

Permanent changes to transportation networks would include improvement of the selected access road, as well as improvements on Amargosa Farm Road. There are no planned improvements to US 95 related to the proposed Project.

Short and long-term, direct and indirect impacts would result from the realignment of Amargosa Farm Road's right-of-way. Its construction would impact local residents of Amargosa Valley by restricting or rerouting access to areas served by the road during the construction of the re-alignment.

4.11.2 Wet-Cooled Alternative

Impacts to land use, recreation, transportation and access from construction and operation of a wet-cooled solar plant would be similar to the impacts described for the Proposed Action (dry-cooled alternative). However, direct impacts to agricultural lands within the Amargosa Valley would increase due to this alternative's higher water requirements, and the need to acquire a stable water supply from historically fully-utilized water rights (most likely certificated or permitted for agricultural use). The additional 4,200 afy needed over the Proposed Action would require that the fields currently being irrigated be fallowed. The Nevada State Engineer generally allots 5 afy/acre for irrigation. Therefore, under the wet-cooled alternative, approximately 840 acres in the Amargosa Desert Hydrographic Basin would be fallowed.

In consideration of the NPS, USFWS, and BLM's concerns regarding the use of water for Project construction and operation on federal rights and resources under their jurisdiction, similar water mitigation measures, as required under the Proposed Action (dry-cooled alternative), would most likely be required under this alternative. The amount of groundwater the agencies would require the Applicant acquire and either retire or hold in abeyance is unknown.

4.11.3 No Action Alternative

Under the No-Action alternative the Project would not be constructed, and there would be no impact to land use, recreation, or transportation.

4.11.4 Mitigation

No mitigation is required.

4.12 VISUAL IMPACT ASSESSMENT

The purpose of the visual impact assessment is to identify and characterize the level of visual impact resulting from the construction, operation, and maintenance of the proposed Project. Visual impact levels are derived by assessing the level of visual change associated with the physical elements of the proposed Project as compared to the existing setting.

Visual change is measured in terms of contrast and typically affects sensitive viewers, scenic quality, and compliance with the applicable agency visual management objectives. Contrast resulting from the proposed Project was assessed using a methodology consistent with the BLM's Manual 8431-1, Visual Resource Contrast Rating. Levels of potential contrast are largely based upon the visibility of cleared vegetation, grading and topographical modifications, and the introduction of new facilities (structures) from sensitive viewing locations. The visual analysis also considered the presence of existing cultural modifications (i.e., transmission lines, industrial developments, primitive roads, etc.) and their effect on the landscape (see Figure 3-18). The following section describes the methodology used to measure potential visual impacts followed by the results of the impact assessment.

4.12.1 Visual Resource Impact Methodology

4.12.1.1 Project and Visual Contrast

Visual Contrast is a measurement of visual change in the landscape resulting from construction and operation of the proposed Project (Project Contrast) as visible from KOPs or other viewpoints. Visual contrast is affected by the viewer's viewing conditions of the Project (i.e. if Project Contrast is not visible, then Visual Contrast would be low or none), the Project Specific Distance Zone in which the Project would be viewed (as distance increase, Visual Contrast decreases), time of day, etc. Per BLM VRM Manual 8431, Visual Contrast can range from weak to strong. In some cases it was appropriate to identify a contrast level between two of the four levels. For example, the Project may demand attention, but does not completely dominate the landscape from a given viewpoint. In this example the contrast level would be moderate/strong. Following are definitions of the four primary BLM Visual Contrast as described in VRM Manual 8431:

- Strong – The element contrast demands attention, will not be overlooked, and is dominant in the landscape.

- Moderate – The element contrast begins to attract attention and begins to dominate the chatacteristic landscape.
- Weak – The element contrast can be seen but does not attract attention.
- None – The element contrast is not visible or percieved.

Sensitive Viewers

Effects to sensitive viewers and their associated KOPs were identified using the following criteria:

- viewer sensitivity (high or moderate)
- distance of sensitive viewer from the Project (foreground, middleground, or background)
- viewing position (superior, level, or inferior views)
- visibility (screened or backdropped views)
- Project contrast (overall visual change)

The consideration of these elements resulted in a Visual Contrast level rating for each KOP, per the BLM's VRM Manual H-8431-1, Visual Contrast Rating.

For sensitive viewers with level views of the proposed Project, as distance from the Project increases, the visibility of Project Contrast decreases due to the relatively low profile of the solar collecting arrays. The Project tends to be less dominant in the landscape because a level viewer would not see the overall surface of the solar collection fields, which based on the time of the day, produce strong color contrast by replicating the typically blue skies. Based on these visual attributes of the Project and typical climatic patterns for Amargosa Valley, Project-specific distance zones were identified within the framework of BLM-specified distance zones as specified below for assesing visual effects.

Project-Specific Distance Zones

As stated, Project-specific distance zones were generated within the framework of BLM criteria for moderate and high sensitivity viewers including:

- 0 to 0.25 mile – BLM Foreground Zone
- 0.25 mile to 1 mile – BLM Foreground Zone
- 1 mile to 3 miles – BLM Foreground Zone
- 3 to 5 miles – BLM Middleground Zone
- 5 miles and beyond – BLM Background Zone

Distance zones are critical in providing context for the proposed Project within the landscape. Within the foreground distance zone of 0 to 0.25 mile, the Project is in close proximity to the viewer which, for a project of this scale, results in strong Visual Contrast. Within the context of Amargosa Valley, views of the Project within the 0.25 to 1 mile distance zone become partially to fully screened by the typically dense vegetation borders and residential/commercial

construction to the east and south of the Project area. The low profile of the Project resembles the natural horizon line the farther the viewer is located from the Project site in the middle to background distance zone. The power blocks may be visible in this distance zone if unobstructed viewing conditions exist and the viewer is superior enough to see over the solar collecting arrays and 30-foot wind fence. However, due to the existence of cultural modifications in the landscape including, but not limited to, residential structures, existing utility lines, cell towers, etc., Visual Contrast would be reduced if the Project is seen within the context of such cultural modifications.

In addition to distance, and in the context of solar projects, viewing position or elevation of the viewer as compared to the elevation of the project, influences the visibility of Project Contrast because viewers at higher elevations tend to see larger portions of the Project within the context of the existing setting. The potentially strongest Project Contrast element for the proposed Project is color associated with the mirrors which predominantly reflect the typically blue Mojave Desert sky as seen from a superior viewing position (or during the early morning or late afternoon from a level viewing position when the mirrors are in a near-vertical position). Conversely, sensitive viewers that are inferior to the Project (i.e., looking up at a project) would have reduced visibility of Project facilities; thus Visual Contrast would be reduced. As the parabolic troughs rotate to track the sun, a glare would occur for a short duration at the beginning and ending of operations (morning and afternoon), increasing Visual Contrast for a short time. Other viewing conditions that contribute to contrast include screening (views that are blocked), backdropping (natural features behind the Project, typically darker than Project elements), and skylining (sky behind Project elements – typically providing a silhouette). Determination of Impacts

Scenic Quality

Due the relatively large size of the proposed Project, impacts to scenic quality considered not only the Project area, but adjacent land as well. Typically, impacts to scenic quality are based on Project Contrast resulting from the construction and operation of the proposed Project. The level of project contrast contributes to the modification of existing landscape character (setting); therefore, the landscape's inherent aesthetics are degraded and impacts would occur. The visual elements (form, line, color, and texture) associated with three major components of the proposed Project (i.e., power block, solar collectors, and transmission line) were evaluated in context with the existing visual elements of the Project site (Class C – creosote flat) and the resulting level of impact was documented.

Sensitive Viewers

Sensitive viewer impacts considered the sensitivity of the viewer and the visibility of Project Contrast based on distance and associated viewing conditions within the context of the existing setting. Using BLM form 8400-4 (Visual Contrast Rating Worksheet) perceived contrast was characterized and documented per BLM VRM requirments. Visual Contrast was combined with viewer sensitivity, to determine visual impacts to sensitive viewers. Visual Contrast Rating Worksheets developed for the Project can be found in Appendix D.

To represent and validate the range of potential visual impacts resulting from the construction and operation of the proposed Project, five photo simulations were prepared per BLM direction and are located in the following section. The simulations were prepared based on high-resolution

photography and corresponding GPS data gathered during field investigations. The photographs were taken using a 50mm lens which best replicates the perspective and depth-of-field associated with the human eye.

After the proposed KOP and simulation photographs were approved by BLM visual resource staff, the simulations were prepared using a proponent-provided 3D model of the proposed facilities combined with Project spatial data and 30-meter terrain models using a combination of GIS and CAD.

After construction of the 3D model associated with the Project, the Project model was combined or composited with the high-resolution photograph using a 3D rendering program. The location of the Project model in the photograph was validated using existing terrain and existing structure (distribution lines) data that was gathered during field investigations. The simulated model was then rendered using appropriate textures, lighting based on the time that the photographs were taken, and representative atmospheric conditions.

Compliance with VRM Classifications

Compliance with VRM classifications was assessed by evaluating Project Contrast within the context of scenic quality and sensitive viewers (Table 4-39). Per BLM requirements, contrast rating sheets (BLM for 8400-4) were prepared from KOPs that demonstrate compliance with VRM Class IV lands (see Appendix D).

Table 4-39 Compliance with Agency Management Objectives

Contrast Level	VRM Class			
	I	II	III	IV
Strong	No	No	No	Yes
Moderate/Strong	No	No	Yes	Yes
Moderate	No	Yes	Yes	Yes
Weak/Moderate	No	Yes	Yes	Yes
Weak	Yes	Yes	Yes	Yes

4.12.2 Proposed Action

Structural facilities for the proposed Project include solar collection fields which include two power blocks in the center of each solar field, and associated facility buildings at the south end of the solar field along Amargosa Farm Road. Construction of the proposed Project would require the removal of vegetation and land grading to achieve a level grade for the entire Project area. Under the Proposed Action, Amargosa Farm Road would be realigned 0.25 mile south of its current location for the length of the Project, with proposed buildings on the north side of the roadway. A 30-foot tall wind-fence with semi-transpartent fabric mesh would be constructed

along the eastern and western Project boundaries. An 8-foot high security fence topped with barbed or razor wire would be constructed along the north and an south end of the Project site.

4.12.2.1 Project Contrast

The determination of Project Contrast was based on the introduction of the solar fields, power blocks, and associated Project components. The regular geometric forms and strong horizontal lines associated with the solar fields would occur as a result of clearing primarily creosote bush within the Project area and the construction of the solar arrays. At certain times of the day the blue reflection of the sky would strongly contrast in color with the surrounding landscape, which is predominately dark green (vegetation) to beige (soils and/or unpaved roads). The introduction of geometric and formal lines and forms associated with the power blocks would result in moderate/strong contrast when compared to the diagonal and angular lines associated with adjacent scenery (Funeral Mountains).

Nighttime Lighting

Potential effects to dark sky resources would result from nighttime operations of the proposed Project. Specifically, lighting of the power blocks for operational safety and security purposes and lighting required to clean mirrors have the potential to introduce a new light source in the immediate vicinity of the Project site. Project construction is anticipated to occur during normal Monday thru Friday daytime working hours. However, if nighttime lighting is needed for construction, any lighting would be directed to the center of the construction area and would be shielded. From a regional perspective, the nighttime operations of the proposed Project are anticipated to introduce a new source of nighttime lighting. No such measurements currently exist that are defensible, and nor do existing measurements meet the requirements of this EIS. Below, however, are recommended mitigation measures that would reduce or minimize dark sky impacts

To reduce lighting impacts during construction and operations, lighting at the facility would be restricted to areas required for safety, security, and operation. Exterior lights would be hooded and lights would be directed on site so that light or glare would be minimized. Low-pressure sodium lamps and fixtures of a non-glare type would be specified. Switched lighting would be provided for areas where continuous lighting is not required for normal operation, safety, or security; this would allow these areas to remain un-illuminated (dark) most of the time and thereby minimizing the amount of lighting potentially visible off-site.

To minimize the risk of collision and disturbance to wildlife from lights, the Proponent proposes various measures, which include specifications that the lighting atop the towers use red lights, rather than steady burning or strobe lighting, and recommendations for lighting to be shielded downward and turned off when not needed.

To the extent feasible, consistent with safety and security considerations, the Proponent will design and install all permanent exterior lighting and all temporary construction lighting such that (1) lamps and reflectors are not visible from beyond the Project site, including any off-site security buffer areas; (2) lighting does not cause excessive reflected glare; (3) direct lighting does not illuminate the nighttime sky, except for any required Federal Aviation Administration

aircraft safety lighting (which should be an on-demand, audio-visual warning system that is triggered by radar technology); (4) illumination of the Project and its immediate vicinity is minimized; and (5) the plan complies with local policies and ordinances. The Project owner will submit to the BLM's Authorized Officer for review and approval and simultaneously to the appropriate local authority for review and comment a lighting mitigation plan that includes the following:

- Location and direction of light fixtures will take the lighting mitigation requirements into account
- Lighting design will consider setbacks of Project features from the site boundary to aid in satisfying the lighting mitigation requirements
- Lighting will incorporate fixture hoods/shielding, with light directed downward or toward the area to be illuminated
- Light fixtures that are visible from beyond the Project boundary will have cutoff angles that are sufficient to prevent lamps and reflectors from being visible beyond the project boundary, except where necessary for security
- All lighting will be of minimum necessary brightness consistent with operational safety and security
- Lights in high illumination areas not occupied on a continuous basis (such as maintenance platforms) will have (in addition to hoods) switches, timer switches, or motion detectors so that the lights operate only when the area is occupied

Scenic Quality

The proposed Project would be located within a BLM-designated Class C landscape (see Figure 3-18) where primarily flat to low rolling topography is occupied by primarily low-growing creosote shrubs. The local setting has been modified by several existing distribution lines, residential and community services facilities, transportation routes, and agricultural fields. Regionally, industrial facilities such as the Valley Substation to the south and a substation to the southeast, several gravel mining facilities, and dispersed residential and community facilities have modified the setting by introducing vertical and horizontal structures into a primarily low profile landscape. Due to the large scale of the Project and the modifications required to construct the Project (i.e., removal of all vegetation where the solar fields are proposed), Project contrast is anticipated to be moderate/strong. However, because the land in which the proposed Project would be located has been designated as Class C, and existing landscape character has already been substantially modified by human development at both the local and regional levels, impacts to scenic quality are anticipated to be moderate.

Sensitive Viewers

Impacts to sensitive viewers are anticipated to range from predominately low, where moderate/strong project contrast would be imperceptible due to distance or screening, to limited areas of high, where high sensitivity viewers have unobstructed views of the Project in the foreground (0 to .25 mile) distance zone. The regular geometric forms associated with the solar fields and dry-cooling system would contrast strongly with the irregular, organic forms

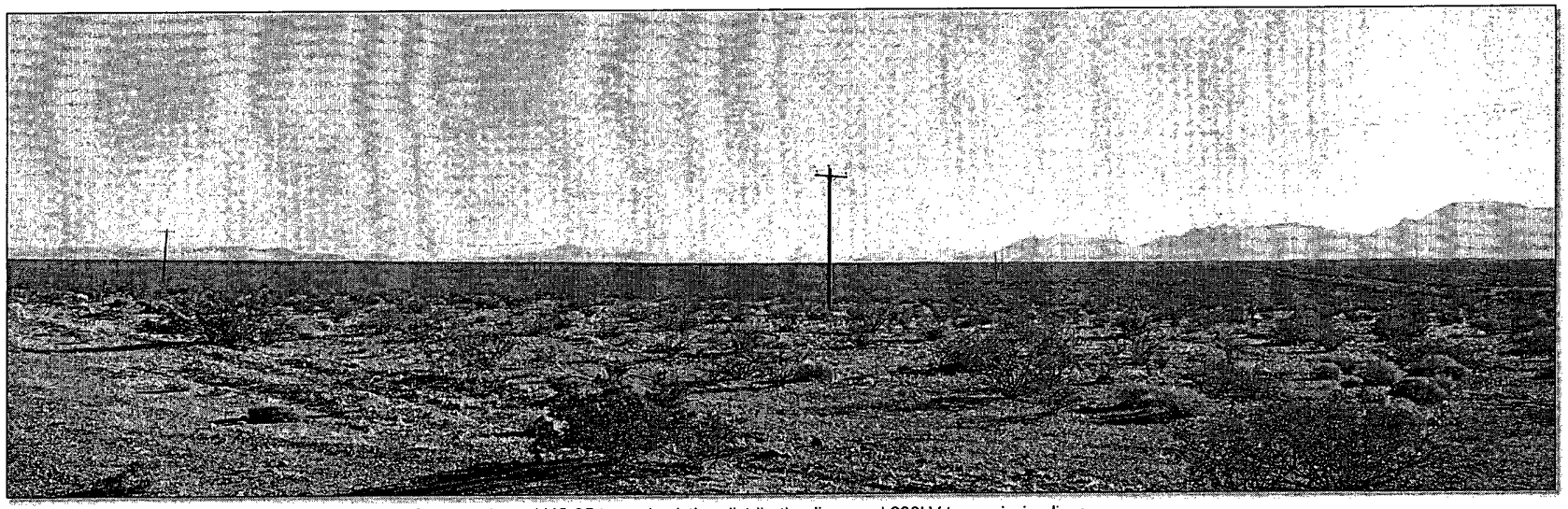
associated with the landscape setting. In addition, color contrast associated with the solar arrays would vary throughout the day as the parabolic mirrors that comprise the arrays track the sun from east to west and reflect the typically blue sky. In limited situations, glare associated with the reflection of the sun would increase contrast and could occur based on viewer position (typically elevated above the project), angle of solar arrays, and atmospheric conditions. It is anticipated that sensitive viewers would have direct to screened views of the solar arrays at a vertical to near vertical position in the early morning (from the east) and late evening (from the west). Hence, the highest impacts are anticipated to occur during these times within the foreground (0 to 0.25 mile) project specific distance zone. A 30-foot tall wind fence is proposed along the eastern and western perimeters; depending on final design and construction, the wind fence could reduce contrast by partially screening the views of the solar facility in the foreground distance zone. Viewers with a superior viewing position would likely perceive moderate/strong project contrast as compared to a level viewing condition. Thus, impacts for those viewers with superior viewing positions would be higher as compared to viewers at the same distance with a level viewing position. There are no sensitive viewers with superior views in the foreground or middleground for the proposed Project.Impacts to sensitive viewers are described below. Overall, impacts to sensitive viewers would be reduced because the Project would:

- be located in primarily the middleground to background distance zone of sensitive viewers (exceptions include the residences east of Sandy Lane and Valley View Boulevard)
- be contructed on land with minimal topographic variation occupied by primarily low growing, evenly spaced Mojave desert vegetation (i.e., creosote bush)
- occur at an elevation where viewers would have level (neutral) views of the Project; therefore, the majority of the Project would be screened by existing landscape features (i.e., vegetation, topography, commercial and residential development, etc.)

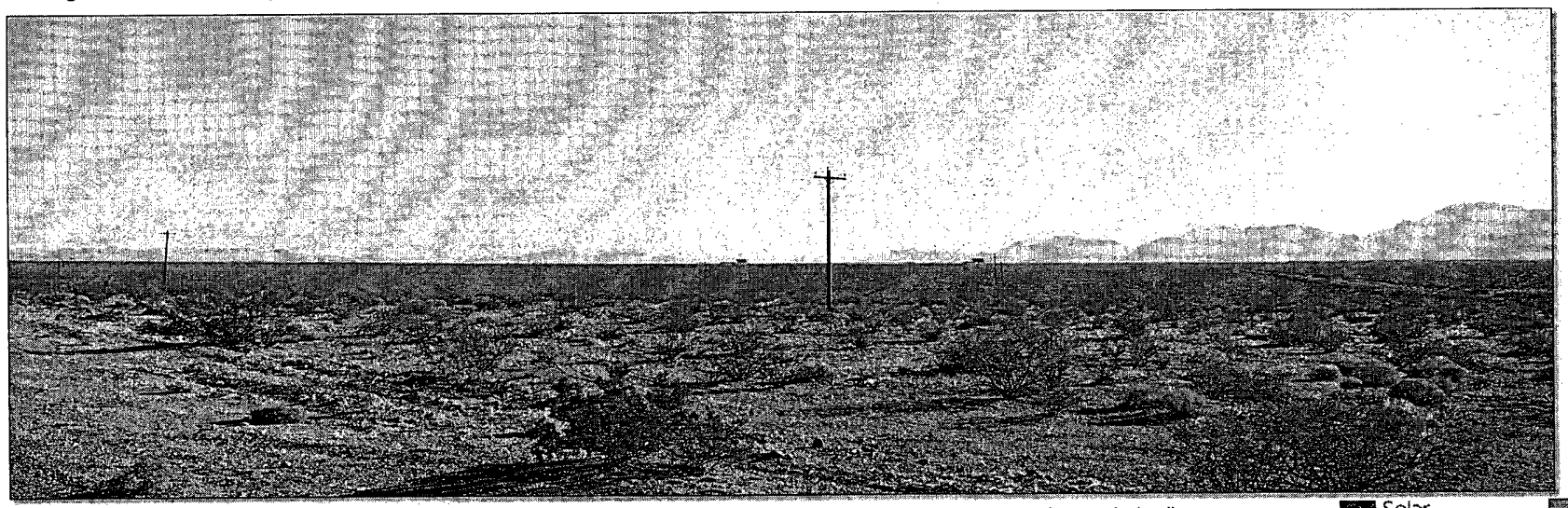
Travel Routes

U.S. Routes

- **US 95 (KOP3, KOP 7)** – Visual Contrast is anticipated to be weak/moderate for moderate sensitivity viewers traveling along US 95. The Project would be viewed from a level viewing position for a short duration in the middleground to background distance zone. At its closest point, the Project would be located approximately 5 miles from this travel route. Due to the low, horizontal nature of the solar arrays seen in context with the vast horizon lines associated with the Basin and Range, Visual Contrast would be weak. At certain times of the day, color contrast would increase as the solar arrays track the sun from east to west, and reflect the typically blue sky of the Great Basin. The cooling towers associated with the power blocks would be partially- to fully- skylined increasing contrast in form, color, and line as illustrated on Figure 4-7 A, B. Therefore, overall impacts are anticipated to range from low to moderate/low.



Existing Condition – View facing south-southeast from eastbound US 95 toward existing distribution lines and 230kV transmission lines



Simulated Condition – Proposed wind fence, solar fields, thermal energy storage tanks, 250 MW power blocks and associated transmission lines, switchyard, and maintenance building. Viewpoint is approximately 6.8 miles to nearest power block

Solar Millennium LLC

Amargosa Farm Road Solar Project
Key Observation Point Simulation 3
Figure 4-7A
June 2010

Photo Date and Time: 12-14-09, 2:39 p.m. Solar Collector Angle: 40 degrees from vertical Atmospheric Conditions: Clear Focal Length: 50mm
Structure models that were used in the simulations were created using 3D Models provided by Solar Millennium, LLC.
This simulation represents the solar array, power blocks, and wind fence locations based on the preliminary site plan dated 12-22-09, which are subject to change based on final design and engineering.

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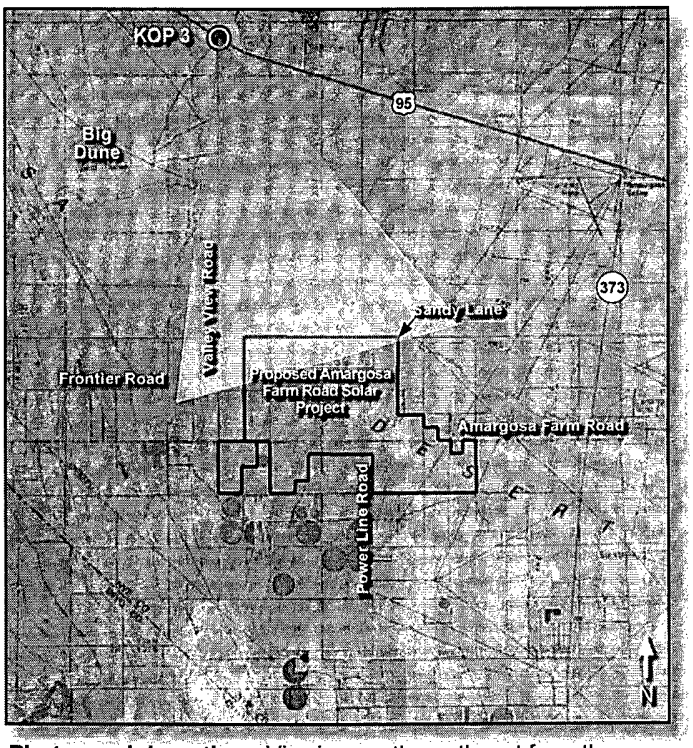
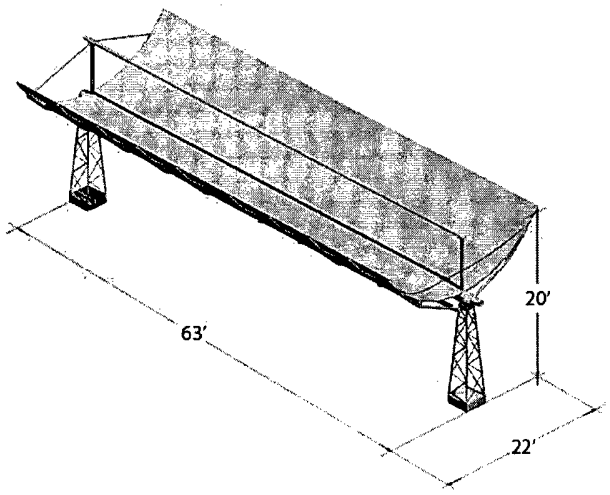


Photograph Location: Viewing south-southeast from the intersections of eastbound US 95 and Valley View Road, Amargosa Valley, Nevada.

Solar Collector Assembly



Typical Solar Collector Assembly based on 3D model provided by Solar Millennium, LLC. Measurements are approximate.

Solar Millennium LLC

Amargosa Farm Road Solar Project
Key Observation Point Simulation 3
Figure 4-7B
June 2010

Structure models that were used in the simulations were created using 3D Models provided by Solar Millennium, LLC.

State Highway Routes

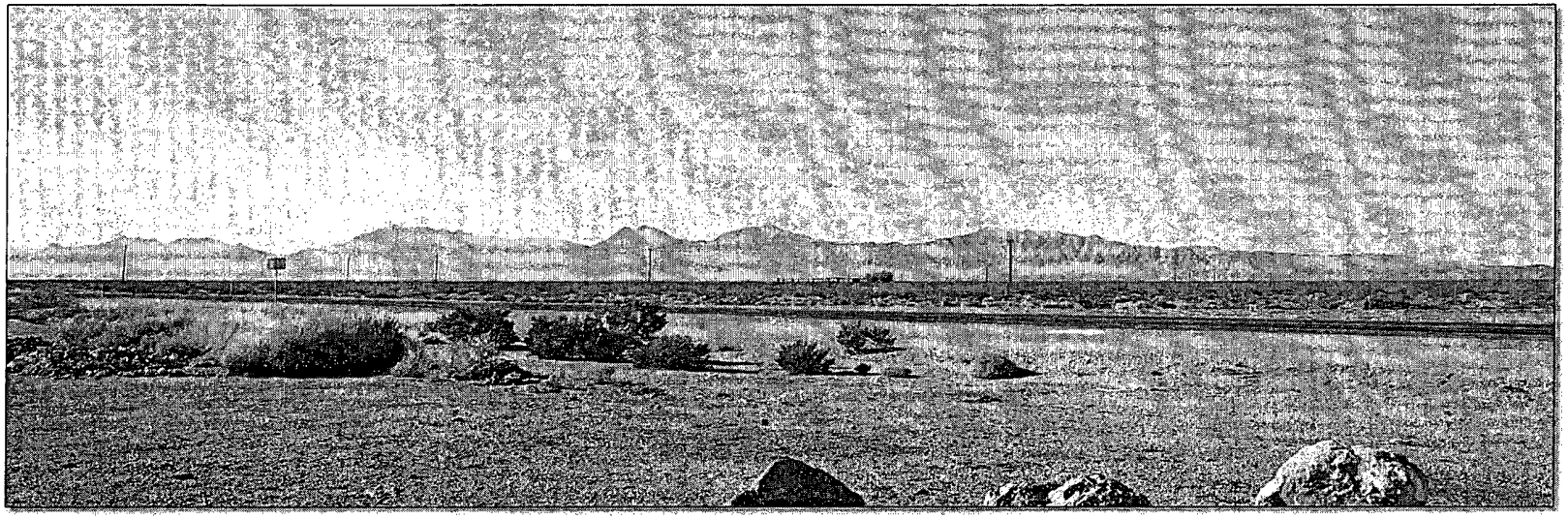
- **NV 373 (KOP 10)** – Visual Contrast is anticipated to range from weak to weak/moderate for moderate sensitivity viewers returning from Death Valley Junction. The Project would be viewed from a level viewing position in the middleground (see KOP 10) to foreground distance zone(s). Visibility of the Project would be partially screened by topography and/or vegetation associated with residential land uses as travelers head north. Although portions of the solar fields and the taller power block components would be seen as travelers get closer to the Project site, existing residential structures, commercial development, town infrastructure (i.e., cell towers), and vegetation reduce Project contrast. Therefore, impacts to travelers using NV 373 are anticipated to range from low to low/moderate.

- **NV 374 (see KOP 14)** – Visual Contrast is anticipated to range from weak to weak/moderate for travelers using NV 374. The proposed Project would be located in the background distance zone (approximately 25 miles) from the viewer where atmospheric conditions and terrain reduce visibility. The reflective nature of the solar arrays would reflect the sky in the afternoon, resulting in a potential increase in visual contrast to weak/moderate. Based on these conditions, and the sensitivity of the viewer, impacts are anticipated to be low.

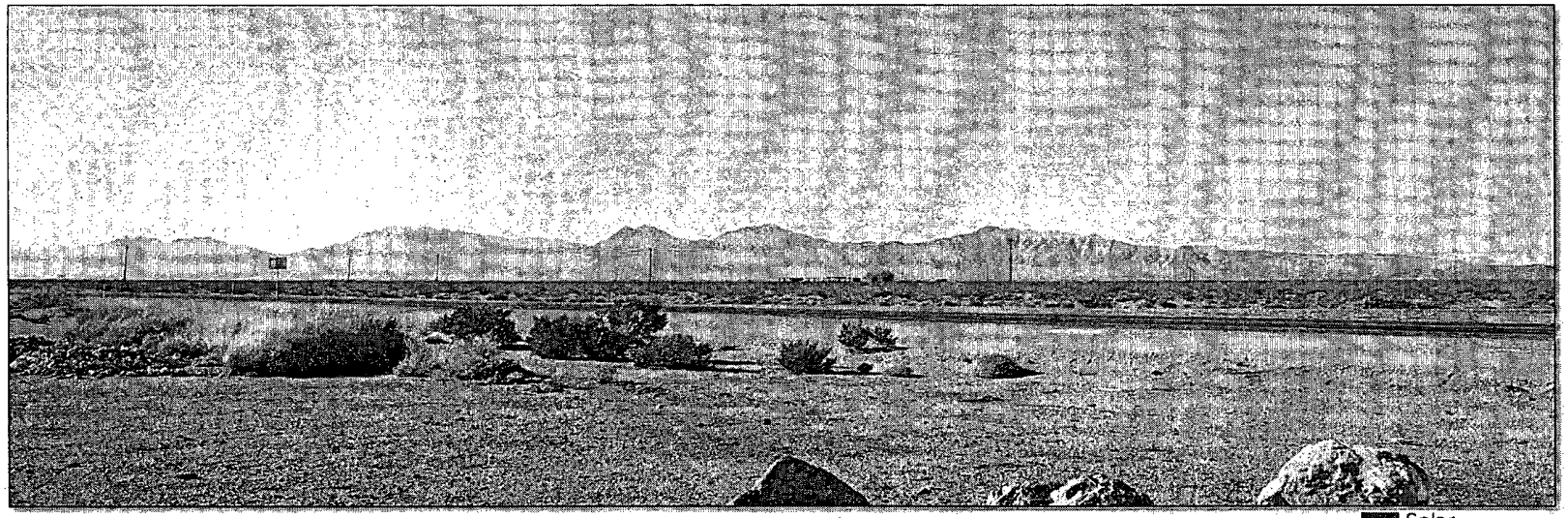
- **NV 160 (KOP 11)** – For moderate sensitivity travelers using NV 160, visual contrast would be weak with slightly superior views of the Project in the background distance zone (15+ miles). Atmospheric conditions may reduce visibility of the Project intermittently throughout the year. The Project would be partially screened by topography (unnamed hills approximately 8 miles east of the Project site), further reducing Project contrast. Therefore, impacts to this moderately sensitive travel route are anticipated to be low.

- **CA 127 (KOP 13)** – Visual Contrast is anticipated to be weak for moderate sensitivity viewers using CA 127. The Project would be viewed from a level viewing position in the background (approximately 18 miles) distance zone. Visibility of the Project would be partially obscured by topography between the Project and the viewer, although the taller power block components could be perceptible on a clear day. Therefore, low impacts are anticipated.

- **Lathrop Wells Rest Park (KOP 2)** – Moderate Sensitivity viewers are anticipated to have level views of the Project in the background (5.5 miles) distance zone resulting in weak visual contrast. The Project would be partially screened by topography and the out-buildings associated with the rest area based on the location of the viewer within the rest area. Farm-related structures are located between the rest area and the Project, which further reduces Project contrast. Impacts are therefore anticipated to be low as illustrated on Figure 4-8 A, B.



Existing Condition – Facing southwest from Lathrop Wells Rest Area toward NV 373, existing distribution lines, and the Funeral Mountains



Simulated Condition – Proposed 250 MW power blocks
Viewpoint is approximately 6.75 miles from nearest power block

Solar Millennium LLC

Amargosa Farm Road Solar Project
Key Observation Point Simulation 2
Figure 4-8A
June 2010

Photo Date and Time: 12-14-09, 10:04 a.m. Solar Collector Angle: 15 degrees from vertical Atmospheric Conditions: Clear Focal Length: 50mm
Structure models that were used in the simulations were created using 3D Models provided by Solar Millennium, LLC.
This simulation represents the solar array, power blocks, and wind fence locations based on the preliminary site plan dated 12-22-09, which are subject to change based on final design and engineering.

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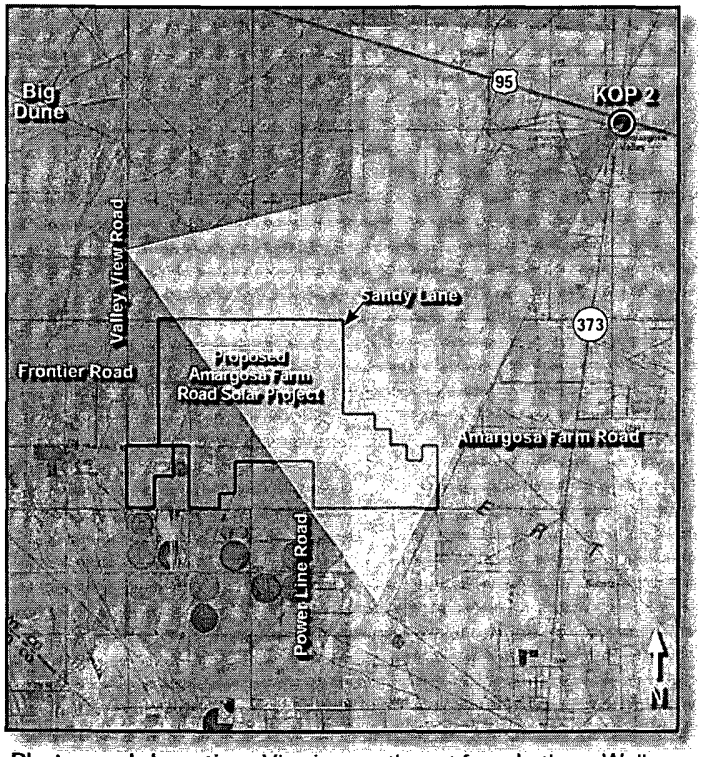
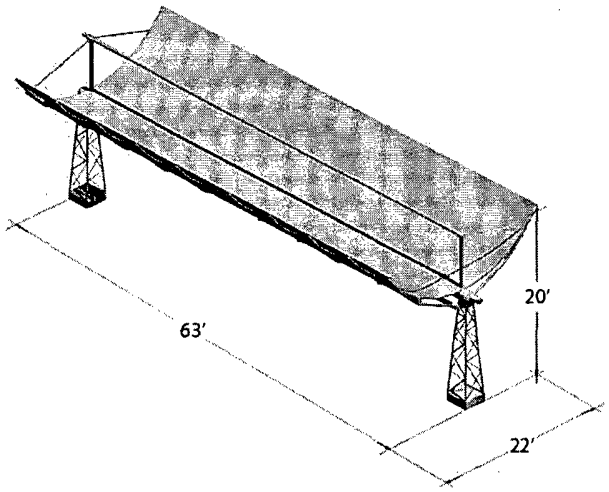


Photograph Location: Viewing southwest from Lathrop Wells Rest area on US 95 and NV 373, Amargosa Valley, Nevada.

Solar Collector Assembly



Typical Solar Collector Assembly based on 3D model provided by Solar Millennium, LLC. Measurements are approximate.

Solar Millennium LLC

Amargosa Farm Road Solar Project
Key Observation Point Simulation 2
Figure 4-8B
June 2010

Structure models that were used in the simulations were created using 3D Models provided by Solar Millennium, LLC.

Local Access Routes

- **Sandy Lane (see KOP 1)** – Moderate/Strong visual contrast is anticipated for the moderate sensitivity viewers that would have level views of the proposed solar fields, power blocks and their associated transmission lines, and wind fence in the foreground distance zone. The Project would be seen primarily by residents traveling to and from their homes along Sandy Lane with unobstructed views of the Project. An introduced landscape buffer (per Nye County Development Agreement) would aid in visually breaking up the expanse of wind fence and adding visual interest between the residents along Sandy Lane and the proposed Project. The wind fence would be 30 feet tall and approximately 600 feet from the edge of the road, obscuring western views of the Funeral Mountains. The semi-transparent material of the wind fence would mute the color, line, and forms associated with the solar troughs throughout the day; thereby reducing Project contrast may be reduced. Nonetheless, based on the close proximity to the Project, high impacts are anticipated.

- **Amargosa Farm Road (KOP 6, KOP 9)** – Moderate/Strong visual contrast is anticipated for the moderate sensitivity viewers that would have level views of the proposed solar fields, power blocks , and administrative buildings in the foreground distance zone. Changes to landform and vegetation color and texture would be weak, and changes to vegetation line and form associated with the wind fence would be moderate from KOPs 6 and 9. However, as commuters travel east or west respectively through the Project site (i.e., between administrative and maintenance buildings and the solar fields), landform, vegetation, and structure contrast would increase based on direct, unobstructed views into the proposed facility. Impacts, therefore, would be moderate/high based on the juxtaposition of the Project and the viewers.

- **Valley View Boulevard** – Moderate/Strong visual contrast is anticipated for the moderate sensitivity viewers commuting to and from their residences. The Project would be located immediately to the east of the road within the context of Amargosa Valley. The power block, and more specifically the dry-cooling unit, would be visible above the 30-foot wind fence, resulting in strong form and color contrast. Additionally, commuters, both north and south-bound, traveling towards the Project in the foreground distance zone, would see the solar fields, as well as portions of the power blocks through the proposed chain link fence. Based on the close proximity and visibility of the Project, high impacts are anticipated to occur.

Recreation Areas

- **Ash Meadows NWR (KOP 12)** – The view from KOP 12 is inferior as compared to the Project site from this background distance zone (10 to 15 miles) view. The Project features would be screened from high sensitivity viewers due to topography and vegetation in the vicinity around the Ash Meadows NWR area, as well as topography changes between the Project and the KOP resulting in weak visual contrast. The effect of the Project is expected to be weak from this view. Overall impacts are anticipated to be low.

- **Death Valley National Park** – There are no views anticipated for high sensitivity viewers with background views from the official recreation areas of the park due to complete screening from topography. Overall impacts are anticipated to be low.

- **Big Dunes (KOP 4)** – Weak/moderate visual contrasts are anticipated for moderate sensitivity users of the Big Dunes OHV area. Views of the Project would be unobstructed in the middleground distance zone (approximately 3.5 miles). The primary components that are discernable from this KOP are the dry-cooling units associated with the power blocks resulting in weak/moderate form and line contrast as illustrated on Figure 4-9 A, B. The solar fields and their associated transmission lines are backdropped by the Resting Spring Mountain and resemble the existing horizon line. Although the dry-cooling units are visible, the regional setting would still remain intact; therefore, impacts would be moderate/low.

- **Funeral Mountains Wilderness (KOP 15)** – The Project, as seen from KOP 15, the Funeral Mountains Wilderness, is expected to result in moderate visual contrast in the background distance zone (13 miles). Due to the north-south orientation of the solar troughs, the blue color that results from the reflection of the sky would be minimized except during mid-day hours. In addition, glare may occur late in the afternoon which would increase visual contrast for a limited time. The major power block elements would be seen, but their visual contrast would be reduced due to the distance, the power block's neutral color, and backdropping. Therefore, overall impacts are anticipated to be moderate.

- **Amargosa River ACEC** – The Project would not be visible from this ACEC; therefore, no impacts would occur.

Residences

- **Valley View Estates (KOP 5)** – The Project would result in moderate/strong visual contrast within the foreground distance zone of high sensitivity residential viewers. Residences would have level, unobstructed views of the Project facility due to the flat character of the existing landscape and low-growing, evenly spaced vegetation. Due to the large scale of the Project, structure contrast would be the dominant visual element. Specifically, views would comprise the solar fields and the top portion of the dry-cooling units as depicted in Figure 4-10 A, B. Views of these components would be partially muted by the opaque material associated with the proposed wind fence. In addition to the moderate/strong contrast, construction and operation of the Project would partially to fully obstruct views of the Spring Mountains to the east-southeast from residences within Valley View Estates; and therefore, impacts are anticipated to be high.

- **Sandy Lane (KOP 1)** – The Project would result in moderate/strong visual contrast within the foreground distance zone from residences along Sandy Lane. Due to the close proximity of the Project to the residences (approximately 700 feet), the wind fence and solar fields would obscure the power block and associated dry-cooling unit although contrast in line, form, and color would still be evident. An introduced landscape buffer (per Nye County Development Agreement) would aid in visually breaking up the expanse

of wind fence and adding visual interest between the residents and the proposed Project. Additionally, existing views of the Funeral Mountains to the west would be dominated by the Project with line and form contrast being the dominant visual elements as depicted on Figure 4-11 A,B. Therefore, impacts to residences along Sandy Lane are anticipated to be high.

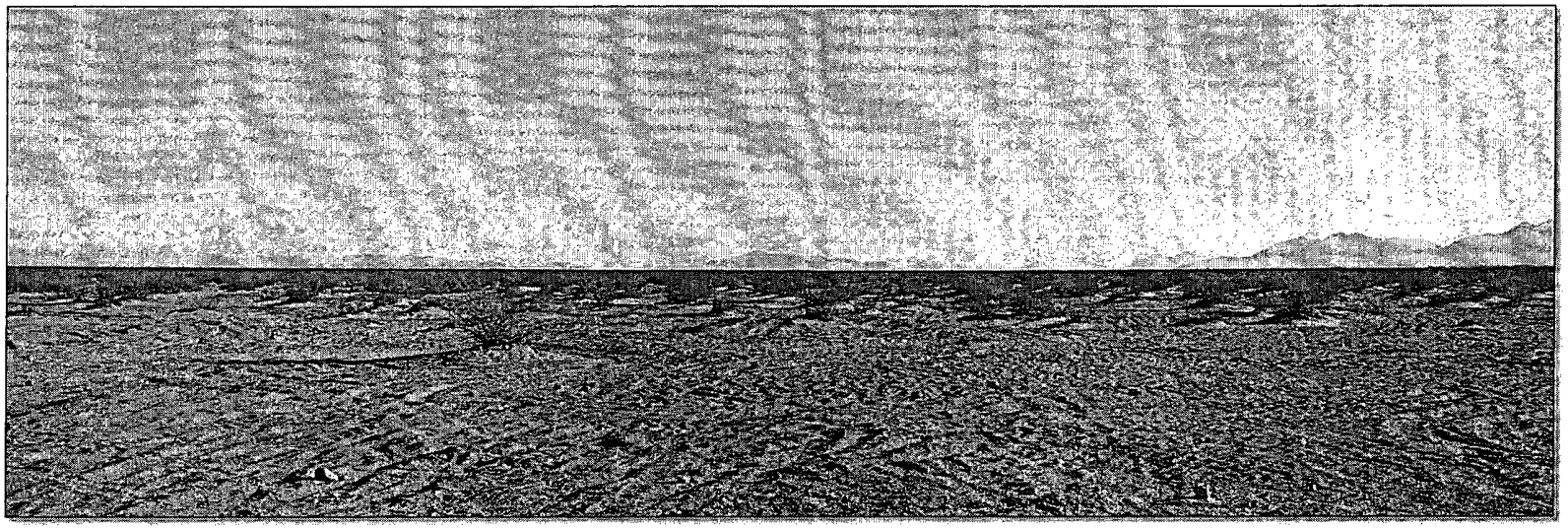
- **Residences East of Sandy Lane (KOP 8)** – Views of the Project from residences east of Sandy Lane would range from direct and unobstructed to completely screened in the foreground distance zone. Moderate/Strong visual contrast would be associated with those residences with unobstructed views of the Project and therefore impacts would be high (similar to those residences along Sandy Lane). Visual contrast would be incrementally reduced for those residences whose views of the Project would be partially- to fully- screened by the dense ornamental vegetation typical of Amargosa Valley and any screening afforded by the proposed landscape buffer. Therefore, impacts are anticipated to range from low to moderate to high.

- **Residences South of Amargosa Farm Road** – Residences are sporadically located from 1 to 5 miles south of Project site. Generally, views of the Project would be partially to fully screened by the mature vegetative borders typical of Amargosa Valley. For those residences that do have views of the Project, structure contrast would be low/moderate because the proposed facilities would be seen in context with the different components of the existing setting (e.g., cell towers, residences, agricultural facilities, etc.) which have similar visual elements as compared to the Project. Therefore, overall impacts are anticipated to range from moderate/low to low based on the level of screening and the context in which the Project is seen.

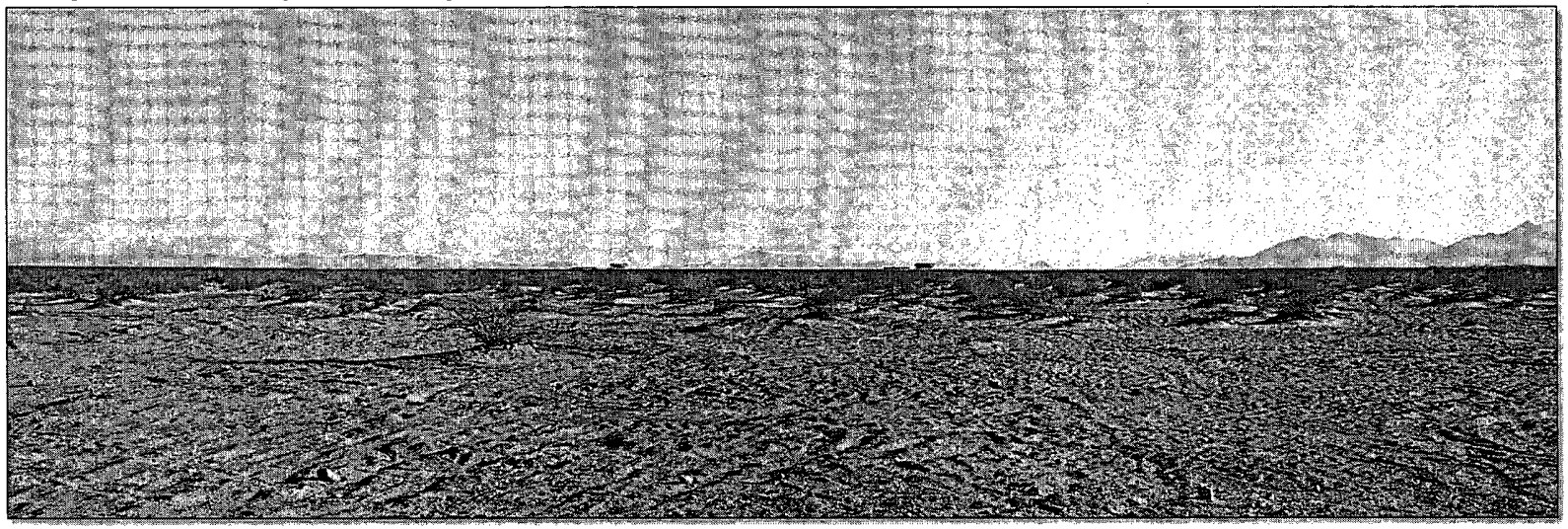
Community Facilities

- **Amargosa Elementary School and adjoining Community Center** – Views of the Project for this moderate sensitivity viewing location are anticipated to be partially to fully screened in the foreground distance zone (1 mile). Dense vegetation around residences to the west of the school would reduce the visibility of project contrast. Impacts, therefore, are anticipated to be low/moderate.

- **Community Park, Amargosa Senior Center, and AVIA Community Center** – Viewers from these locations would have partially screened to screened views of the Project based on the occurrence of vegetation, residences, and community facilities. Views of the Projects ancillary facilities proposed along Amargosa Farm Road, including the switchyard, administrative building, and assembly hall could be direct and unobstructed. However, visual contrast associated with these facilities is anticipated to be weak/moderate, because the visual elements associated with these features would be similar to existing features found within the town of Amargosa Valley. Moderate visual contrast would occur in those locations that the dry-cooling units would be visible. Therefore, impacts would range from low to moderate based on the visibility of the aforementioned Project components.



Existing Condition – View facing southeast from Big Dune Recreational Area



Simulated Condition – Proposed wind fence, solar fields, thermal energy storage tanks, 250 MW power blocks and associated transmission lines, and switchyard
Viewpoint is approximately 5.0 miles to nearest power block

Solar Millennium LLC

Amargosa Farm Road Solar Project
Key Observation Point Simulation 4
Figure 4-9A
June 2010

Photo Date and Time: 12-14-09, 2:51 p.m. Solar Collector Angle: 40 degrees from vertical Atmospheric Conditions: Clear Focal Length: 50mm
Structure models that were used in the simulations were created using 3D Models provided by Solar Millennium, LLC.
This simulation represents the solar array, power blocks, and wind fence locations based on the preliminary site plan dated 12-22-09, which are subject to change based on final design and engineering.

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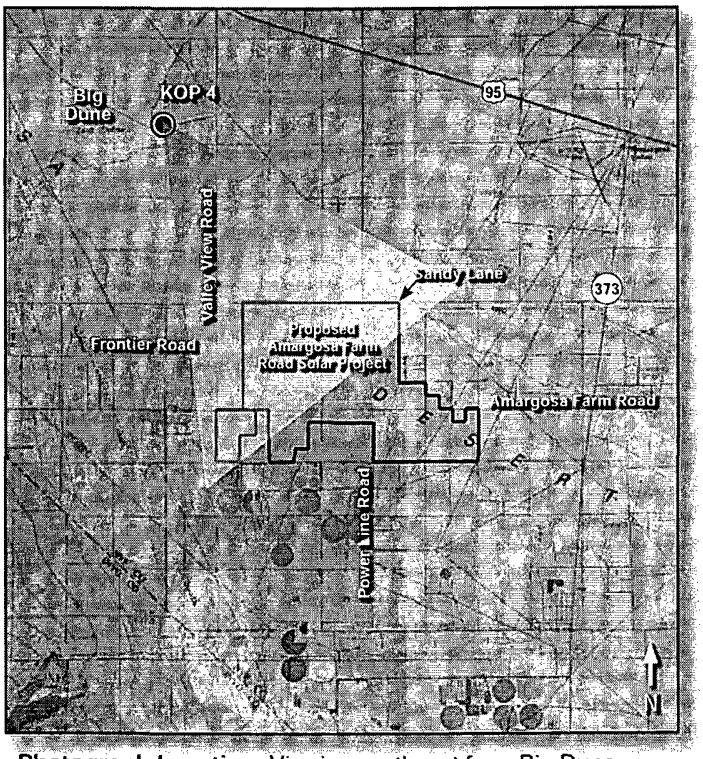
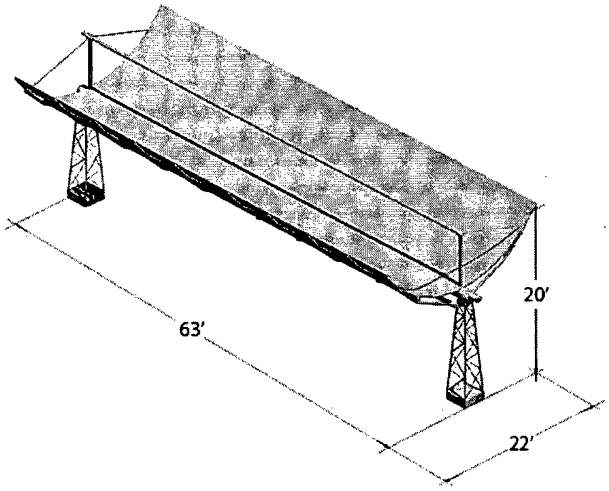


Photograph Location: Viewing southeast from Big Dune Recreational Area, 1 mile west of Valley View Road, Amargosa Valley, Nevada.

Solar Collector Assembly



Typical Solar Collector Assembly based on 3D model provided by Solar Millennium, LLC. Measurements are approximate.

Solar Millennium LLC

Amargosa Farm Road Solar Project
Key Observation Point Simulation 4
Figure 4-9B
June 2010

Structure models that were used in the simulations were created using 3D Models provided by Solar Millennium, LLC.

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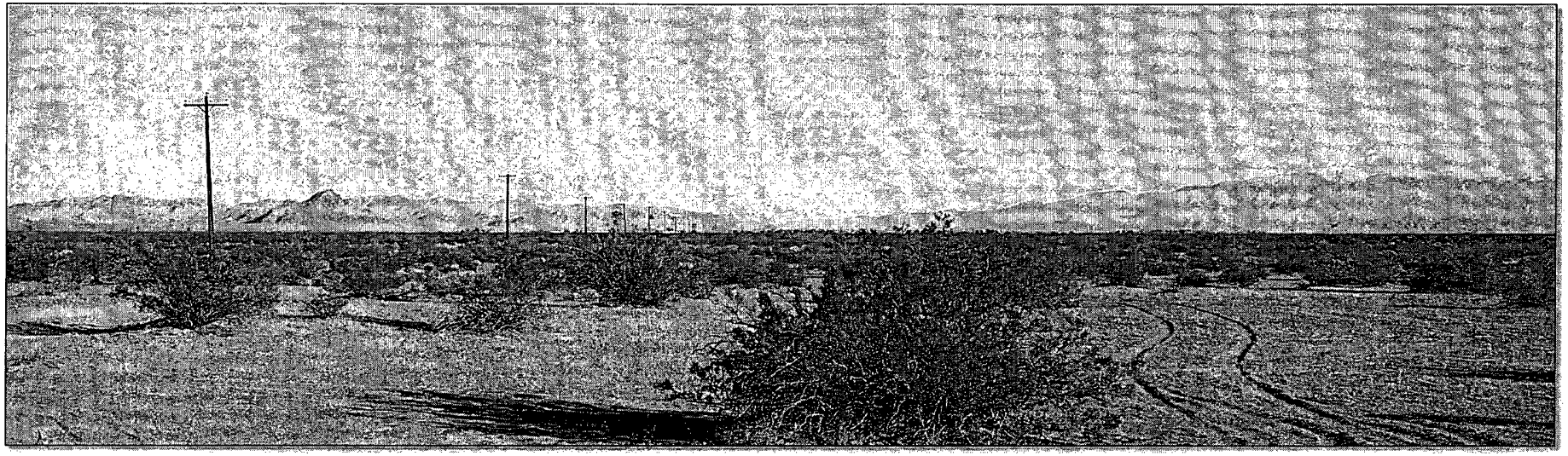
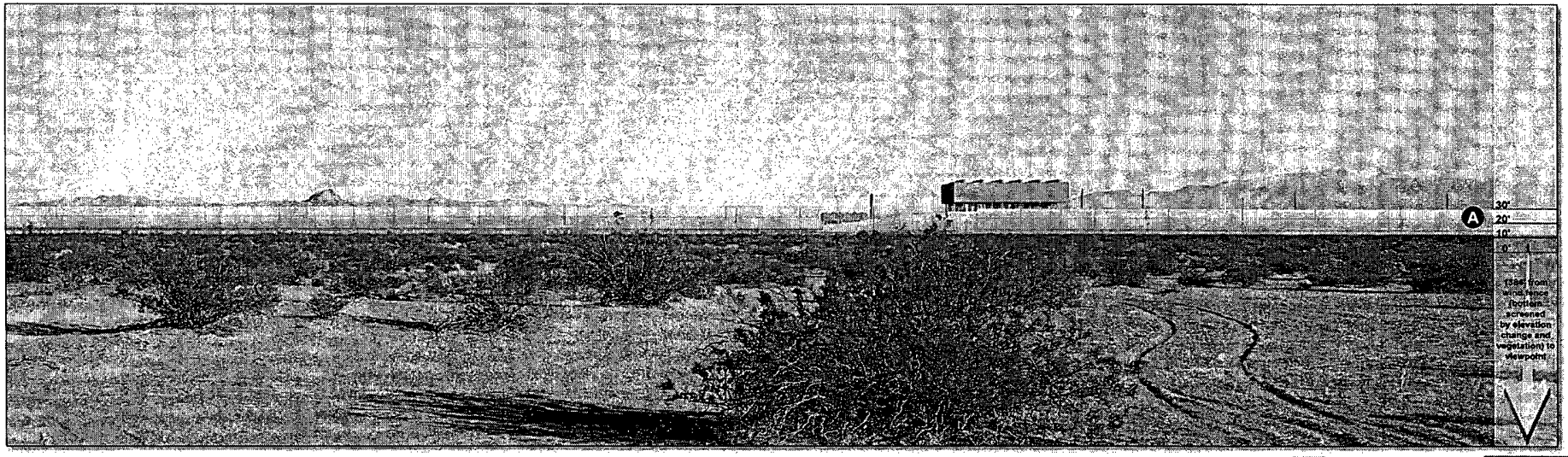


Existing Condition – View facing east from Valley View Estates toward the existing distribution line and the Spring Mountains



Simulated Condition – Proposed wind fence (30 feet tall), solar fields, 250 MW power blocks with associated transmission lines, and re-routed distribution lines
Viewpoint is approximately 0.25 mile from fence and 0.94 mile from cooling tower

Solar Millennium LLC

Amargosa Farm Road Solar Project
Key Observation Point Simulation 5
Figure 4-10A
June 2010

Photo Date and Time: 12-14-09, 3:06 p.m. Solar Collector Angle: 40 degrees from vertical Atmospheric Conditions: Clear Focal Length: 50mm
Structure models that were used in the simulations were created using 3D Models provided by Solar Millennium, LLC.
This simulation represents the solar array, power blocks, and wind fence locations based on the preliminary site plan dated 12-22-09, which are subject to change based on final design and engineering.

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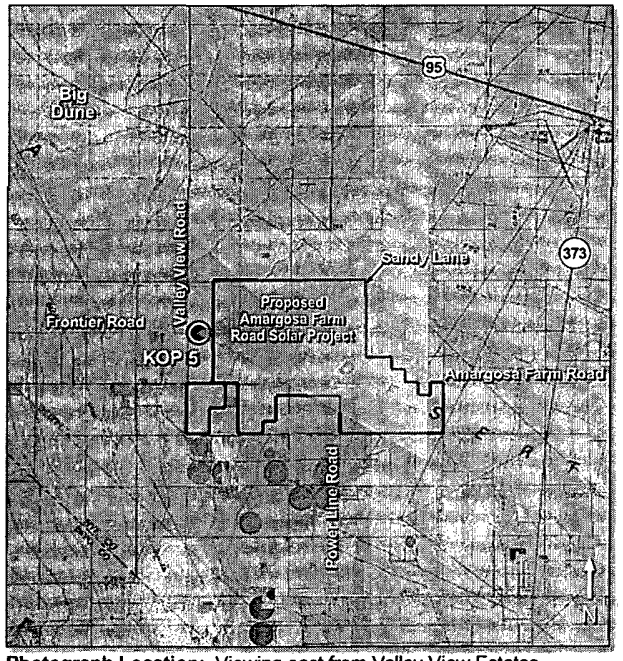
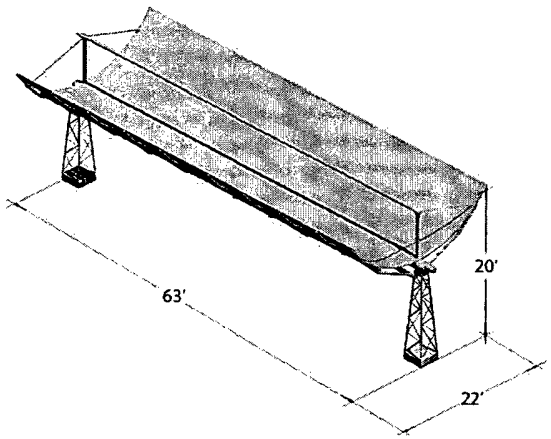


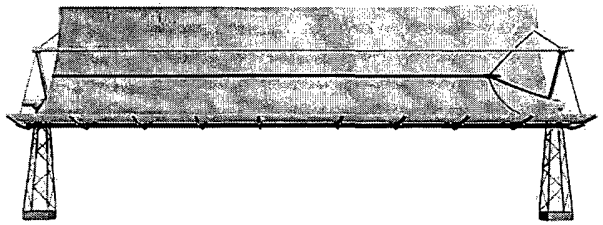
Photograph Location: Viewing east from Valley View Estates residential area at Frontier Road, 0.25 mile east from Valley View Road, Amargosa Valley, Nevada.

Solar Collector Assembly

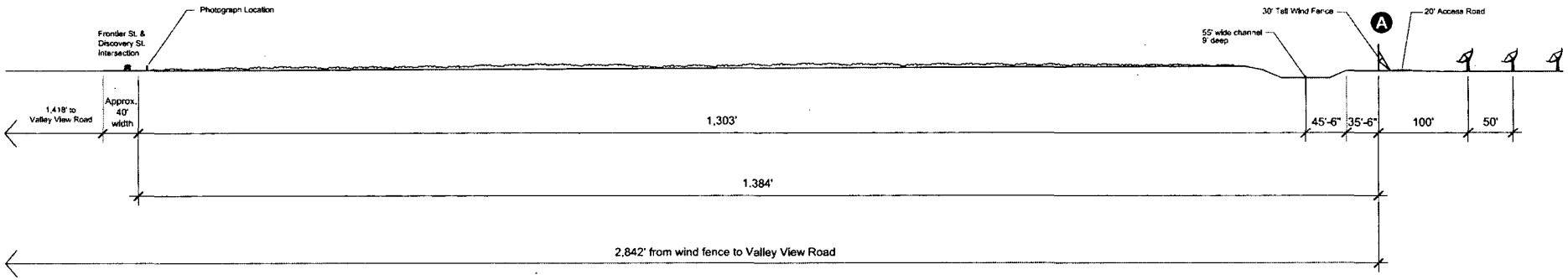


Typical Solar Collector Assembly based on 3D model provided by Solar Millennium, LLC. Measurements are approximate.

Solar Collector Assembly



Typical Solar Collector Assembly based on 3D model provided by Solar Millennium, LLC. This solar collector's mirror is rotated to represent the angle of the mirrors shown in KOP 5 photograph.



Cross Section – Frontier St. and Discovery St. intersection to perimeter channel, wind fence (30 feet tall), access road, and solar collectors

Solar Millennium LLC

Amargosa Farm Road Solar Project
Key Observation Point Simulation 5
Figure 4-10B
June 2010

Photo Date and Time: 12-14-09, 3:06 p.m. Solar Collector Angle: 40 degrees from vertical Atmospheric Conditions: Clear Focal Length: 50mm
Structure models that were used in the simulations were created using 3D Models provided by Solar Millennium, LLC.
This cross section represents the solar array, channel, and wind fence locations based on the preliminary site plan dated 12-22-09, which are subject to change based on final design and engineering.

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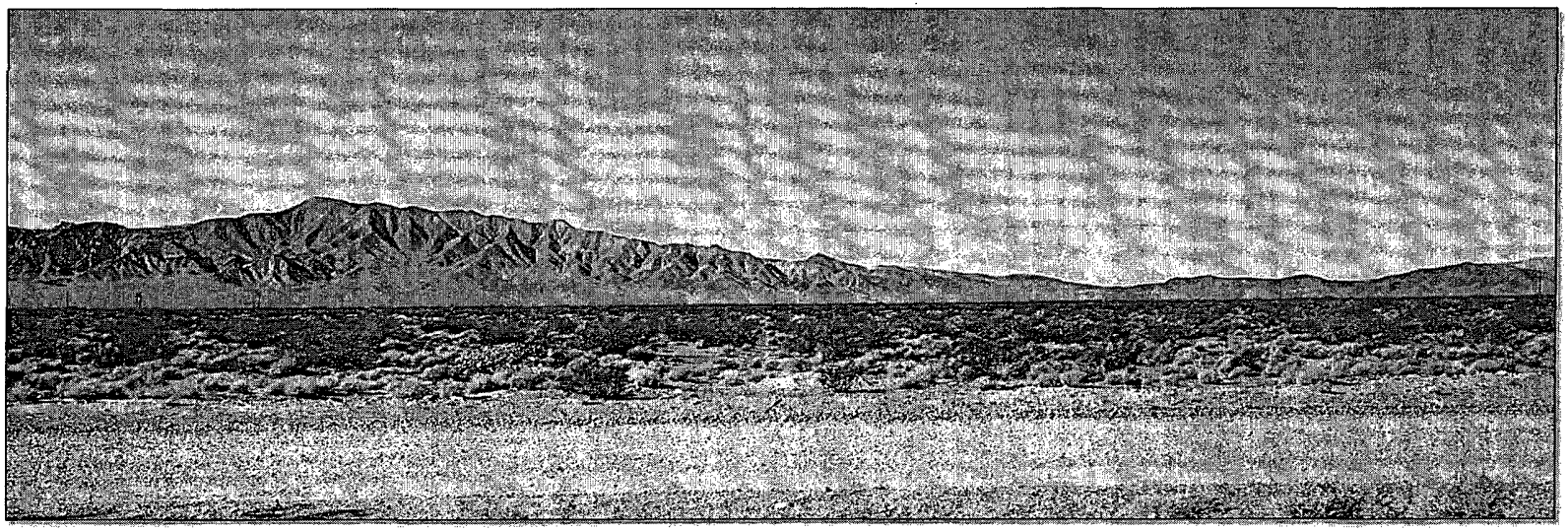
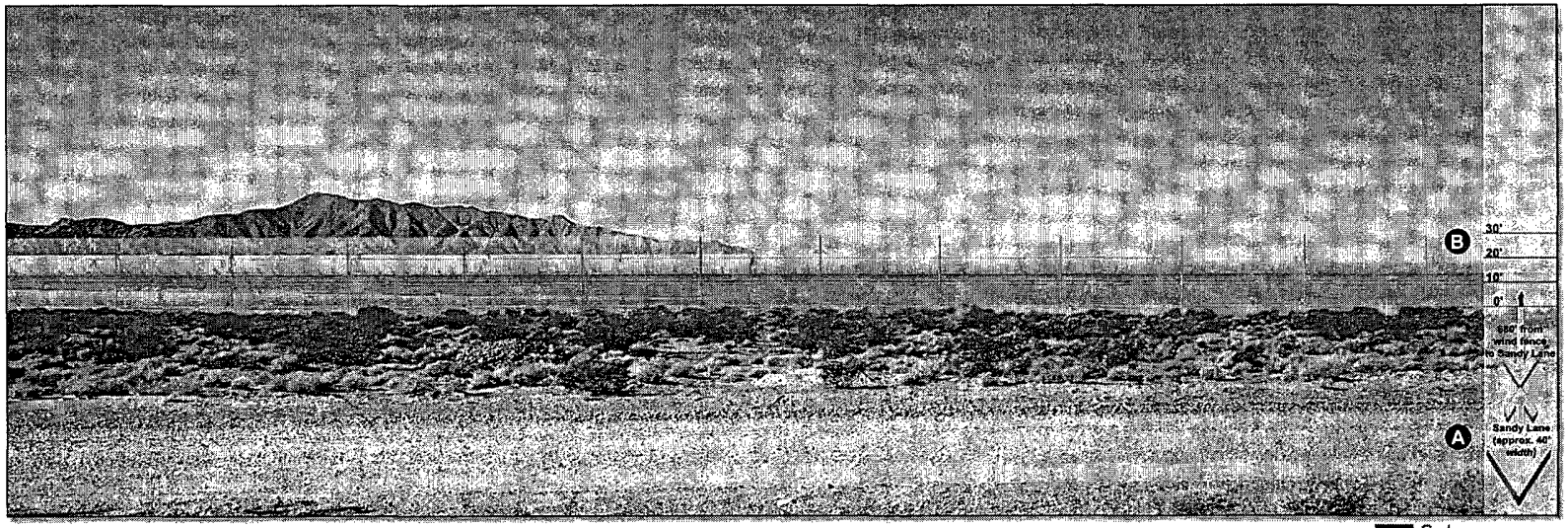


Existing Condition – Facing west from Sandy Lane Residential Area toward Sandy Lane, BLM lands, existing distribution line, and the Funeral Mountains



Simulated Condition – Proposed perimeter channel (screened by vegetation), wind fence (30 feet tall), solar fields, and thermal energy storage tanks

Viewpoint is approximately 720 feet from wind fence and 0.9 mile from nearest power block (obscured by solar fields and wind fence)

Photo Date and Time: 11-23-09, 10:33 a.m. Solar Collector Angle: 15 degrees from vertical Atmospheric Conditions: Clear Focal Length: 50mm
Structure models that were used in the simulations were created using 3D Models provided by Solar Millennium, LLC.
This simulation represents the solar array, power blocks, and wind fence locations based on the preliminary site plan dated 12-22-09, which are subject to change based on final design and engineering.

Solar Millennium LLC

Amargosa Farm Road Solar Project
Key Observation Point Simulation 1
Figure 4-11A
June 2010

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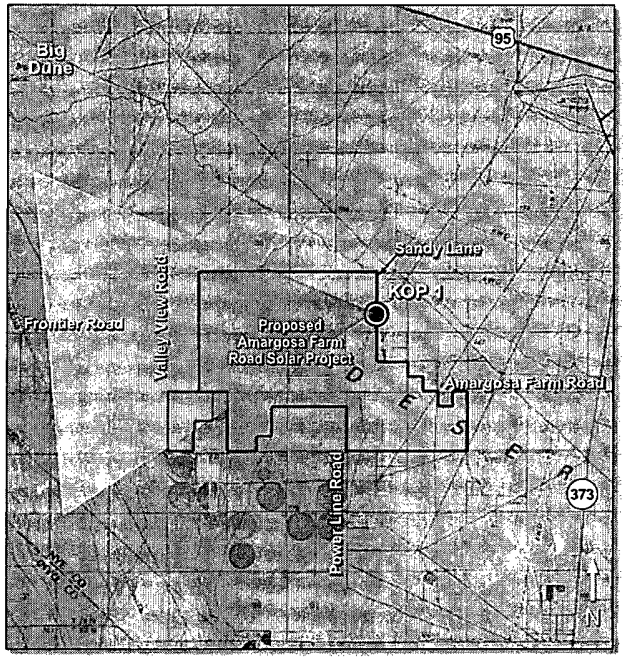
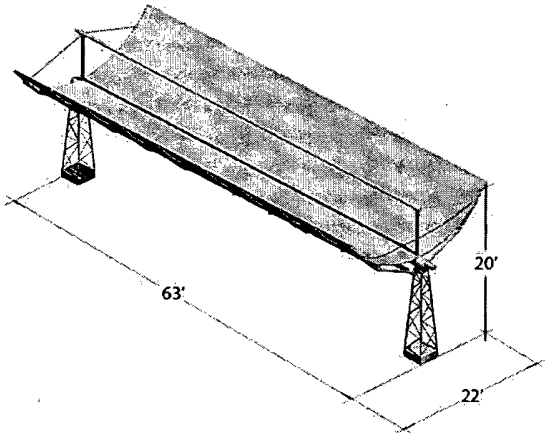


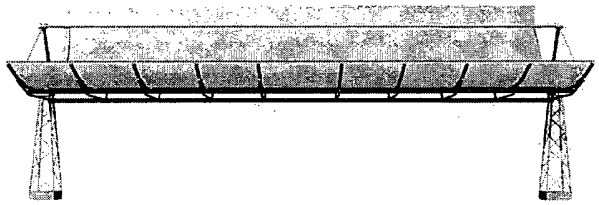
Photograph Location: Viewing west from a residential area at Sandy Lane, 0.32 mile north of Frontier Road, Amargosa Valley, Nevada.

Solar Collector Assembly

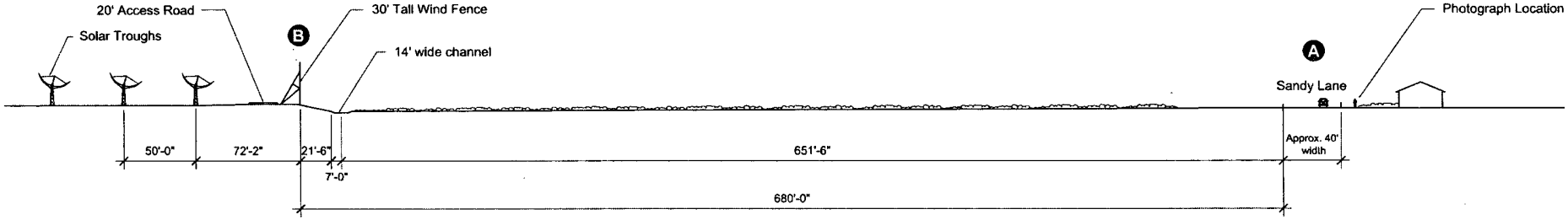


Typical Solar Collector Assembly based on 3D model provided by Solar Millennium, LLC. Measurements are approximate.

Solar Collector Assembly



Typical Solar Collector Assembly based on 3D model provided by Solar Millennium, LLC. This solar collector's mirror is rotated to represent the angle of the mirrors shown in KOP 1 photograph.



Cross Section – Sandy Lane to perimeter channel, wind fence (30 feet tall), access road, and solar collectors

Solar Millennium LLC

Amargosa Farm Road Solar Project
Key Observation Point Simulation 1
Figure 4-11B
June 2010

Photo Date and Time: 11-23-09, 10:33 a.m. Solar Collector Angle: 15 degrees from vertical Atmospheric Conditions: Clear Focal Length: 50mm
Structure models that were used in the simulations were created using 3D Models provided by Solar Millennium, LLC.
This cross section represents the solar array, channel, and wind fence locations based on the preliminary site plan dated 12-22-09, which are subject to change based on final design and engineering.

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Historic Features

- **Rhyolite and Rhyolite Cemetery (KOP 14)** – Visual contrast is expected to be weak in those locations in which the proposed Project would be visible in the background distance zone (25 miles). Viewers would have partially screened to screened views based on topography, although views would be from a superior vantage point. The Project would be completely backdropped due to the viewing angle, but the reflective nature of the solar mirrors could possibly be seen reflecting the sky in the afternoon which would raise visual contrast to weak/moderate for a short duration of time. An existing landfill is 0.5 mile east of the cemetery, which dominates the view towards the Project site. Impacts are anticipated to be low for viewers within both the Town of Rhyolite and the Rhyolite Cemetery.

4.12.2.2 Compliance with Visual Resource Management Objectives

The proposed Project would be located on BLM land designated as Class IV. Compliance with VRM objectives for Class IV designated land is anticipated because the proposed Project would be located in a Class IV landscape with the following management objective: *provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high* (BLM VRM Manual 8400). The visual contrast and resulting impacts identified through the visual assessment range from low in those locations that the Project would be screened or viewed in the background distance zone, to limited areas of high impacts where high sensitivity viewers would have direct, unobstructed views of the Project in foreground distance zone. These impacts and associated changes to landscape character are consistent with Class IV objectives; therefore, consistent with applicable planning documents.

4.12.3 Wet-Cooled Alternative

Impacts to visual resources under the wet-cooled alternative would be similar to those described for the Proposed Action (dry-cooling alternative), with two exceptions. First, under the wet-cooled alternative, visual contrast would be reduced for those KOPs with views of the dry-cooling unit associated with the Proposed Action, which include KOPs 1 thru 6, 9, 10, and 15. This reduced visual contrast results from the fact that the wet-cooling unit would be at least half the height of the dry-cooling unit, and therefore would be less visible to sensitive viewers. High impacts would remain for residences located along Sandy Lane and within Valley View Estates, but impacts would be reduced for all other identified sensitive viewers identified in section 4.12.1.2.

Second, the wet-cooling alternative would have greater visual impacts than the dry-cooled alternative in the form of a periodic vapor plume. The Proponent has completed a desktop study looking at other similar projects, such as the Beacon Solar Energy Project's Application for Certification filing with the California Energy Commission, and this analysis and its results are described below.

4.12.3.1 Vapor Plume Analysis

Cooling tower associated with wet-cooled solar projects are a potential source of visible water vapor plumes during daylight hours. As part of the Beacon Solar Energy Project impact studies, the solar developer conducted an analysis to estimate the potential size and frequency of visible plume formation during daylight hours. The Seasonal and Annual Cooling Tower Impacts (SACTI, Version 9/30/90) model was applied for this analysis. The following subsection presents a quantitative analysis of the vapor plumes emitted from the proposed Beacon Solar Energy Project facilities. The modeling results for the vapor plume are shown in Table 4-40.

Table 4-40 Cooling Tower Daytime Vapor Plume Analysis Results

Plume Length Case	Length (ft)	Daytime Frequency (hrs/yr)[1]
Maximum	1,371	7
90 Percentile	958	128
50 Percentile	92	173

[1]Yearly average based on 3 years of data
Source: ENSR 2008

4.12.4 No Action Alternative

The No Action Alternative would result in no Project related impacts to visual resources because no Project facilities would be constructed on BLM land.

4.12.5 Mitigation

Color mitigation – Surfaces of all ancillary facilities that are visible to the public, excluding the solar arrays, will be treated with paint colors that blend with the surrounding landscape ("desert" browns and tans).

The Project owner will treat the surfaces of all Project structures and buildings (including temporary structures related to construction) visible to the public such that (1) their colors minimize visual intrusion and visual contrast by blending with the existing characteristic landscape colors; (2) their colors and finishes do not create excessive glare; and (3) their colors and finishes are consistent with local policies and ordinances. The transmission line conductors will be non-specular and non-reflective, and the insulators will be non-reflective and non-refractive. Following in-field consultation with the BLM Visual Resources specialist and other representatives as deemed necessary by the BLM, the Project owner will submit for review and approval a specific Surface Treatment Plan that will satisfy these requirements.

The treatment plan will include:

- A description of the overall rationale for the proposed surface treatment, including the selection of the proposed color(s) and finishes based on the characteristic landscape

- A list of each major project structure, building, tank, pipe, and wall; the transmission line towers and/or poles; mirror support structure; concrete-lined drainage channel and fencing, specifying the color(s) and finish proposed for each. Colors must be identified by vendor, name, and pantone number; or according to a universal designation system
- One set of color brochures or color chips showing each proposed color and finish
- A specific schedule for completion of the treatment
- A procedure to ensure proper treatment maintenance for the life of the Project

The Project owner will not specify to the vendors the treatment of any buildings or structures treated during manufacture, or perform the final treatment on any buildings or structures treated in the field, until the Project owner receives notification of approval of the visual treatment plan by BLM's Authorized Officer. Subsequent modifications to the treatment plan are prohibited without BLM's approval.

- Landscape Screening – Landscape screening may be used to reduce visibility of the Project in locations that high sensitivity viewers have unobstructed foreground views of the Project. This condition pertains to the residences located along Sandy Lane and just east of Valley View Boulevard. Per Nye County Development Agreement, a vegetated landscape buffer is proposed between Sandy Lane and the wind-fence approximately 600 feet from roadway right-of-way (Appendix F).
- Restoration of disturbed areas – Any temporary areas that are used during the construction process are to be restored (vegetation, topographic).
- Nighttime Lighting – The Proponent shall consider location and type of lighting and other dark sky mitigation measures to minimize potential light pollution to the greatest extent practicable. Mitigation measures include (but are not be limited to) light hoods/shields, directional lighting, minimum required brightness, setbacks from project perimeter, and 'as-needed' usage. See Section 4.12.3.1 under Nighttime Lighting for detail on the proposed lighting scheme.

4.13 HUMAN HEALTH AND SAFETY/HAZARDOUS MATERIALS

The anticipated direct and indirect impacts from construction, operation, and maintenance of the proposed Project are addressed in the following sections.

As discussed in Section 2.0, Project Description, the proposed Project will be designed to meet all applicable standards to reduce the risk of an accidental release, operated in a manner that complies with safety standards and practices, and maintained so as to provide a safe workplace for Project personnel and to prevent significant adverse off-site impacts to the public at large. In addition, construction and operation will incorporate up-to-date industrial technology and design standards, and adhere to regulatory health and safety codes and guidelines, as well as established

good industrial practices. Training, operating, inspection, and maintenance procedures that will minimize the risk and severity of potential upset conditions will be implemented.

4.13.1 Proposed Action

4.13.1.1 Construction Phase

Hazardous materials that are anticipated for use during construction include gasoline, diesel fuel, oil, lubricants, welding gases (e.g., acetylene, oxygen, and argon), and small quantities of solvents and paint. There are no feasible alternatives to these materials for operating construction vehicles and equipment, and conducting other construction activities such as welding. No acutely hazardous substances will be used or stored on-site during construction.

Diesel fuel is the hazardous material with the greatest potential for environmental consequences during the construction phase, due to the volume of diesel fuel that will be used in construction equipment and the frequent refueling that will be required. Diesel fuel as well as gasoline will be stored in an on-site fuel depot. When refueling of the on-site diesel and/or gasoline storage tank is required, a mobile fuel truck will be brought on-site. The fueling will be supervised by the fuel truck operators. Any fuel spilled will be promptly cleaned up, and any contaminated soil disposed of in accordance with the applicable state and federal requirements.

Small volumes of hazardous materials will be temporarily stored on-site inside fuel and lubrication service trucks. Paints and solvents will be stored in flammable material storage cabinets. Welding gases will be stored in steel cylinders and chained upright to a solid support structure, with the safety cover over the valve when not in use to prevent damage. Maintenance and service personnel will be trained in handling these materials. The most likely incidents involving these hazardous materials would be associated with minor spills or leaks. Impacts to site workers, the public, or the environment due to a minor spill or leak will be mitigated through the emergency response training program and procedures that will be implemented by Project construction contractors and employees, and by thoroughly cleaning up minor spills as soon as they occur.

Soil contaminated by a spill or leak will be disposed in accordance with applicable state and federal requirements. Minimal risk of fire and/or explosion exists with the use of these types of materials in the limited quantities that will be used. There is minimal potential for environmental impacts from incidents involving other hazardous materials during construction.

4.13.1.2 Operational and Maintenance Phase

Hazardous materials will be used and stored on-site during operations and maintenance. The hazardous material inventory, the general operational safety practices employed during hazardous material storage and use, the material-specific handling practices, and the toxicity of each hazardous material are discussed below.

4.13.1.3 Hazardous Material Inventory

A list of the large-quantity hazardous materials that may be stored and used at the Project site along with the toxicity and storage practices for each material is provided in Table 4-41. The quantities identified in the table are per power block. For the purpose of this discussion, "large quantity" is defined as those chemicals stored or used in excess of 55 gallons for liquids, 500 pounds for solids, and 200 cubic feet for compressed gases. In addition to the chemicals listed in Table 4-31, small quantities (less than 55 gallons, 500 pounds, or 200 cubic feet) of janitorial supplies, office supplies, laboratory supplies, paint, degreasers, herbicides, pesticides, air conditioning fluids (chlorofluorocarbons), gasoline, hydraulic fluid, propane, and welding rods typical of those purchased from retail outlets may also be stored and used at the Project site. These materials will be stored in the maintenance warehouse or office building. Flammable materials (e.g., paints, solvents) will be stored in flammable material storage cabinet(s) with built-in containment sumps.

The remainder of the materials will be stored on shelves as appropriate. Due to the small quantities involved, the controlled environment, and the concrete floor of the warehouse, a spill can be cleaned up without significant environmental consequences.

4.13.1.4 General Operating Practices

Chemicals will be stored or processed in vessels or tanks specifically designed for their individual characteristics. All hazardous materials storage or process vessels will be designed in conformance with applicable ASME codes. Large quantity (bulk) liquid chemicals will be stored outdoors in aboveground storage tanks manufactured of carbon steel or plastic, or in 400-gallon (nominal) capacity plastic totes, if applicable.

Due to the amount of fuel to be stored onsite, a site specific SPCC Plan must be developed and adhered to during construction and operations. Spill containment structures (e.g., curbing, double-walled tanks or equivalent) to contain the chemicals in the event of a leak or spill will be constructed around each of the large-quantity hazardous chemical storage tanks or totes. Bulk storage tanks or totes will have secondary containment structures capable of holding the tank or tote volume plus an allowance for precipitation (25-year, 24-hour rain event). Concrete containment structures will be coated with a chemical resistant coating (e.g., epoxy) to ensure long-term integrity of the containment structure.

Small quantity chemicals will be stored in their original delivery containers in order to minimize risk of upset. Personnel working with chemicals will be trained in proper handling technique and in emergency response procedures for chemical spills or accidental releases. Appropriate PPE will be provided.

Table 4-41 Summary of Special Handling Precautions for Large Quantity Hazardous Materials *

Hazardous Material and CAS No.[1]	Relative Toxicity[2] and Hazard Class[3]	RQ[4] pounds (kg)	Permissible Exposure Limit (PEL)	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Sulfuric Acid, 29.5% solution CAS No. 7664-93-9	High toxicity; Hazard class – Corrosive, water reactive	1,000 lbs	PEL: 1 milligram per cubic meter (mg/m^3)	Contained in batteries; 2,000 gal total inventory	Isolated from incompatible chemicals and secondary containment
CO_2 CAS No. 124-38-9	Low toxicity; Hazard class – Nonflammable gas	Not Applicable	TLV: 5,000 ppm (9,000 mg/m^3) TWA	Carbon steel tank; 15 tons maximum onsite inventory	Carbon steel tank with crash posts
Therminol VP-1 Biphenyl (26.5%) CAS No. 92-52-4 Diphenyl ether (73.5%) CAS No. 101-84-8	Moderate toxicity, Hazard class – Irritant; Combustible Liquid (Class III-B)	Biphenyl = 100 lbs (45.4 kg) Diphenyl ether = Not applicable	Biphenyl = PEL: 0.2 milliliters per cubic meter (ml/m^3) (8-hr TWA) TLV: 0.2 ml/m^3 (1 mg/m^3) (8-hr TWA) Diphenyl ether = TLV: 1 ml/m^3 (8-hr TWA) TLV: 2 ml/m^3 (15-min TWA) PEL: 1 ml/m^3 (7 mg/m^3) (15-min TWA)	1.3 million gal in system, no additional onsite storage	Continuous monitoring of pressure in piping network; routine inspections (sight, sound, smell) by operations staff; isolation valves throughout piping network to minimize fluid loss in the event of a leak; prompt clean up and repair
Lube Oil CAS No. 64741-97-5	Low toxicity Hazard class – NA	Not applicable	TLV: (oil mist, mineral) 5 mg/m^3 (ACGIH 2001)	Carbon steel tanks, 10,000 gallons in equipment and piping, additional maintenance inventory of up to 550 gallons in 55-gallon steel drums	Secondary containment area for each tank and for maintenance inventory

Table 4-41 Summary of Special Handling Precautions for Large Quantity Hazardous Materials *

Hazardous Material and CAS No.[1]	Relative Toxicity[2] and Hazard Class[3]	RQ[4] pounds (kg)	Permissible Exposure Limit (PEL)	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Mineral Insulating Oil CAS No. 8042-47-5	Low toxicity Hazard class – NA	Not applicable	None established	Carbon steel transformers; total onsite inventory of 36,000 gallons	Used only in transformers, secondary containment for each transformer
Diesel Fuel CAS No. 68476-34-6	Low toxicity; Hazard class – Combustible Liquid	Not applicable	PEL: none established TLV: 100 mg/m^3 (ACGIH)	Carbon steel tank (1,150 gallon [generator & fire water pump engine])	Stored only in fuel tank of emergency engine, secondary containment
Hydrogen	Low toxicity; Hazard class – Flammable gas	Not applicable	None Established	In generator cooling loop and "tube trailer"; piping system inventory 350 pounds; plus 650 lbs in storage trailer	Pressure safety tank, crash posts, pressure relief valves
Nitrogen CAS No. 7727-37-9	Low toxicity; Hazard class – Non-Flammable Gas	Not applicable	None established	Carbon steel tank; 7,500 lbs total inventory	Carbon steel tank with crash posts
Hydraulic fluid CAS No. 64741-89-5	Low to moderate toxicity; Hazard class – Class IIIB Combustible Liquid	Not applicable	TWA (oil mist): 5 mg/m^3 STEL: 10 mg/m^3	Carbon steel tanks and sumps; 500 gallons in equipment, maintenance inventory of 110 gallons in 55-gallon steel drums	Found only in equipment with a small maintenance inventory; maintenance inventory stored within secondary containment
Welding gas Acetylene CAS No. 74-86-2	Moderate toxicity; Hazard class – Toxic	10,000 lbs	PEL: none established	Steel cylinders; 200 cubic feet each, 800 cubic feet total on site	Inventory management, isolated from incompatible chemicals
Welding gas Oxygen CAS No. 7782-44-7	Low toxicity; Hazard class – Oxidizer	Not applicable	PEL: none established	Steel cylinders; 200 cubic feet each, 800 cubic feet total on site	Inventory management, isolated from incompatible chemicals

Table 4-41 Summary of Special Handling Precautions for Large Quantity Hazardous Materials *

Hazardous Material and CAS No.[1]	Relative Toxicity[2] and Hazard Class[3]	RQ[4] pounds (kg)	Permissible Exposure Limit (PEL)	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Welding gas Argon CAS No. 7440-37-1	Low toxicity; Hazard class – Non-flammable Gas	Not applicable	PEL: none established	Steel cylinders; 200 cubic feet each, 800 cubic feet total on site	Inventory management
Activated Carbon CAS No. 7440-44-0	Non-toxic (when unsaturated), low to moderate toxicity when saturated, depending on the adsorbed material; Hazard class – combustible solid	Not Applicable	TWA (total particulate): 15 mg/m^3 TWA (respirable fraction): 5 mg/m^3 TLV (graphite, all forms except graphite fibers): 2 mg/m3 TWA	Used in two x 2,000-lb canisters, 4,000 lbs total inventory, no additional storage	No excess inventory stored on site, prompt disposal when spent
Calcium Hypochlorite 100% CAS No. 7778-54-3	Moderate toxicity; Hazard Class – Corrosive, Irritant	10 lbs	PEL: none established Acute oral toxicity (LD50): 850 mg/kg [Rat].	Minimal onsite storage for water treatment, not expected to exceed 50 lbs	Inventory management, isolated from incompatible chemicals
Water treatment chemical Sodium Carbonate (soda ash) CAS No. 497-19-8	Low toxicity; Hazard class – Irritant	Not Applicable	Not Applicable	10 tons	Stored in steel silos. Inventory management, isolated from incompatible chemicals
Water treatment chemical Lime (calcium oxide) CAS No. 1305-78-8	Moderate toxicity; Hazard class - Irritant	Not Applicable	TLV: 2 mg/m^3 as TWA;(ACGIH 2004). OSHA PEL: TWA 5 mg/m^3 NIOSH IDLH: 25 mg/m^3 See: 1305788	10 tons	Stored in steel silos. Inventory management, isolated from incompatible chemicals
Water treatment chemical Magnesium Chloride CAS No. 7786-30-3	Non-toxic; Hazard class – NA	Not Applicable	Not Applicable	500 gallons	Inventory management
Water treatment chemical Sodium Bisulfate (aka sodium hydrogen sulfate)	Low toxicity; Hazard class – Irritant	Not Applicable	Sodium bisulfate = PEL: none established: TLV: 5 mg/m^3 TWA	500 gallons	Inventory management, isolated from incompatible chemicals

Table 4-41 Summary of Special Handling Precautions for Large Quantity Hazardous Materials *

Hazardous Material and CAS No.[1]	Relative Toxicity[2] and Hazard Class[3]	RQ[4] pounds (kg)	Permissible Exposure Limit (PEL)	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Boiler water treatment chemical Ferric Sulfate (35% solution) CAS Number 10028-22-5	Moderate toxicity; Hazard class - Irritant	1,000 lbs	TBD	10,000 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO Tri-Act 1800 *or equivalent* Cyclohexlyamine (5 – 10%) Monoehtanolamine (10 – 30%) Methoxyproplyamine (10 – 30%)	High toxicity; Hazard class – Corrosive, Class II Combustible liquid	Not Applicable	Cyclohexlyamine = TLV: 10 ppm (41 mg/m^3) Monoethanolamine = TLV: 3 ppm (7.5 mg/m^3) TWA: 3 ppm (7.5 mg/m^3) STEL: 6 ppm (15 mg/m^3) Methoxyproplyamine = TLV: 5 ppm TWA STEL: 15 ppm	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO Elimin-Ox Carbohydazide (5 -10%) *or equivalent*	Moderate toxicity; Hazard class – Sensitizer	Not Applicable	Carbohydazide = PEL: none established	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO 3D Trasar 3DT185 Phosphoric Acid (60 - 100%) *or equivalent*	High toxicity; Hazard class – Corrosive	Not Applicable	Phosphoric acid = PEL: 1 mg/m^3 (TWA) TLV: 1 mg/m^3 (TWA), STEL: 3 mg/m^3	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO 3D Trasar 3DT177 *or equivalent* Phosphoric acid (30%)	Moderate toxicity; Hazard class – Irritant	Not Applicable	Phosphoric acid = PEL: 1 mg/m^3 (TWA) TLV: 1 mg/m^3 (TWA), STEL: 3 mg/m^3	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment

Table 4-41 Summary of Special Handling Precautions for Large Quantity Hazardous Materials *

Hazardous Material and CAS No.[1]	Relative Toxicity[2] and Hazard Class[3]	RQ[4] pounds (kg)	Permissible Exposure Limit (PEL)	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Water treatment chemical NALCO 3D Trasar 3DT190 *or equivalent*	Low toxicity; Hazard class – Irritant	Not Applicable	None established for mixture	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO Acti-Brom (R) 7342 *or equivalent* Sodium bromide	Low toxicity; Hazard class – Irritant	Not Applicable	Sodium bromide = PEL: none established	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO pHreedom® 5200M *or equivalent* Sodium salt of phosphonomethylated diamine	Low to moderate toxicity; Hazard class – Irritant	Not Applicable	Sodium salt of phosphonomethylated diamine = PEL: none established	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO PCL-1346	Low toxicity; Hazard class – Irritant	Not Applicable	None established for mixture	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO Permacare (R) PC-7408 Sodium bisulfate CAS No. 7631-90-5	Low toxicity; Hazard class – Irritant	5,000 lbs	Sodium bisulfate = PEL: none established: TLV: 5 mg/m^3 TWA	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO BT-3000 *or equivalent* Sodium hydroxide CAS No. 1310-73-2 Sodium tripolyphosphate	High toxicity; Hazard class – Corrosive	Sodium Hydroxide 1,000 lbs	Sodium hydroxide = PEL: 2 mg/m^3 Sodium tripolyphosphate = PEL: none established	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment

Table 4-41 Summary of Special Handling Precautions for Large Quantity Hazardous Materials *

Hazardous Material and CAS No.[1]	Relative Toxicity[2] and Hazard Class[3]	RQ[4] pounds (kg)	Permissible Exposure Limit (PEL)	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Boiler water treatment chemical, pH adjustment Sodium Hydroxide (50%) CAS Number 1310-73-2	High toxicity; Hazard class – Corrosive	1,000 lbs	Sodium hydroxide = PEL: 2 mg/m^3	10,000 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO 8338 *or equivalent* Sodium nitrite Sodium tolytriazole Sodium hydroxide	Moderate toxicity; Hazard class – Toxic	Not Applicable	Sodium nitrite = PEL: none established Sodium tolytriazole = PEL: none established Sodium hydroxide = PEL: 2 mg/m^3	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical 93%-98% sulfuric acid CAS No. 7664-93-9	High toxicity; Hazard class – Corrosive, water reactive	1,000 lbs	TLV: 0.2 mg/m^3 MAK: 0.1 mg/m^3 NIOSH REL: TWA 1 mg/m^3 NIOSH IDLH: 15 mg/m^3 OSHA PEL: 1 mg/m^3	1,000 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical Sodium Hypochlorite (13% solution) CAS No. 7689-52-9	High toxicity; Hazard class – Poison-B, Corrosive	100 lbs	Workplace Environmental Exposure Limit (WEEL) - STEL: 2 mg/m3 PEL: 0.5 ppm (TWA) STEL: 1 ppm as Chlorine TLV: 1 ppm (TWA) STEL: 3 ppm as Chlorine	1,000 gallons	Inventory management, isolated from incompatible chemicals

Table 4-41 Summary of Special Handling Precautions for Large Quantity Hazardous Materials *

Hazardous Material and CAS No.[1]	Relative Toxicity[2] and Hazard Class[3]	RQ[4] pounds (kg)	Permissible Exposure Limit (PEL)	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Oxygen Scavenger Reagent Acetic Acid 60% CAS No. 64-19-7 Iodine 20% CAS No. 7553-56-2 De-ionized water 20% CAS No. 7732-18-5	Moderate toxicity; Hazard Class – Corrosive, Irritant	5,000 lbs	PEL: 10 ppm TWA PEL: 0.1 ppm N/A	Minimal onsite storage for water treatment, not expected to exceed 50 lbs	Inventory management, isolated from incompatible chemicals
Boiler water treatment oxygen scavenger Carbohydrazide CAS No. 497-18-7	High toxicity; Hazard class – Irritant	Not applicable	Carbohydazide = PEL: none established	600 gallons	Inventory management, isolated from incompatible chemicals
Herbicide Roundup® or equivalent CAS No. 38641-94-0	Low toxicity; Hazard class – Irritant	Not applicable	Isopropylamine salt of glyphosphate = no specific occupational exposure has been established	No onsite storage, brought on site by licensed contractor, used immediately	No excess inventory stored on site
Soil stabilizer Active ingredient: acrylic or vinyl acetate polymer or equivalent CAS No. Active ingredient is 'Not Hazardous'	Non-toxic; Hazard class – NA	Not applicable	None established	No onsite storage, supplied in 55-gallon drums or 400-gallon totes, used immediately	No excess inventory stored on site

Table 4-41 Summary of Special Handling Precautions for Large Quantity Hazardous Materials *

Hazardous Material and CAS No.[1]	Relative Toxicity[2] and Hazard Class[3]	RQ[4] pounds (kg)	Permissible Exposure Limit (PEL)	Storage Description; Capacity	Storage Practices and Special Handling Precautions

* This table has been developed based on the applicant's understanding of the proposed processes at the time of development. Continued engineering and process refinements may likely necessitate additions, deletions and/or substitutions of materials identified above.

[1] CAS No. – Chemical Abstracts Service registry number. This number is unique for each chemical.

[2] Low toxicity is used to describe materials with an National Fire Protection Agency (NFPA) health rating of 0 or 1. Moderate toxicity is used describe materials with an NFPA rating of 2. High toxicity is used to describe materials with an NFPA rating of 3. Extreme toxicity is used to describe materials with an NFPA rating of 4.

[3] NA denotes materials that do not meet the criteria for any hazard class defined in the 1997 Uniform Fire Code.

[4] RQ – Reportable Quantity for hazardous substance as designated under section 102(a) defined under CERCLA. (To note: This table includes those chemicals stored or used in excess of 55 gallons for liquids, 500 pounds for solids, and 200 cubic feet for compressed gases.

[5] RQ – Reportable Quantity for extremely hazardous substance as designated under section 302(a)(2) defined under CERCLA.

Appropriate safety programs will be developed to address hazardous materials storage and use, emergency response procedures, employee training requirements, hazard recognition, fire safety, first aid/emergency medical procedures, hazardous materials release containment/control procedures, HAZCOM training, PPE training, and release reporting requirements. These programs include a fire response program, a plant safety program, and facility standard operating procedures.

As stated in the Development Agreement between Nye County and the Proponent (Nye County 2010) "Prior to accepting hazardous materials within the boundaries of the Proposed Development, developer shall provide the County a facility emergency plan which contains:

- a description of the training, equipment, facilities and procedures that will be used to respond to emergencies occurring within the boundaries of the Proposed Development
- certification that such equipment, facilities and procedures have been approved by all applicable state and federal authorities
- a description of the emergency response protocols and the respective responsibilities of Developer and County."

4.13.1.5 Chemical-Specific Operating Practices and Chemical Toxicity

Substance-specific operating practices and toxicity issues are described in the following paragraphs.

Fuel Gas Delivery

LPG will supply gas to boilers used for rapid daily plant startup and for HTF freeze protection. There will be two truck deliveries each week for both power plant units. A total of approximately 18,000 gallons of LPG will be stored at each power plant unit. LPG consists mainly of propane and butane. LPG is a flammable gas with a NFPA hazard rating of 4 with low toxicity. The fuel gas supplier will comply with all USDOT and NDOT regulations that apply to the transport of hazardous substances.

Diesel fuel as well as gasoline will be stored in an on-site fuel depot. When refueling of the on-site diesel and/or gasoline storage tank is required, a mobile fuel truck will be brought on-site. The fueling will be supervised by the fuel truck operators. Any fuel spilled will be promptly cleaned up, and any contaminated soil disposed of in accordance with the applicable state and federal requirements.

Compressed Gas Storage

Compressed gases stored and used at the facility may include gases typically used for maintenance activities, such as shop welding. These gases include acetylene, argon, and oxygen.

Acetylene is a flammable gas. It is highly reactive, however, it is not toxic. Oxygen is an oxidizer with low toxicity. Argon has low toxicity but may cause asphyxiation if released in a

confined area. The potential impacts presented by the use of these gases within the solar plant are less than significant based on the following site-specific conditions:

- Compressed gases will be stored in standard compressed gas cylinders at the facility (typically 200 cubic feet per cylinder), and the total quantity will be kept to the minimum required for operation and maintenance.
- The compressed gases will be delivered and stored in USDOT-approved safety cylinders, and secured to a solid support (such as a building or rack) to prevent tipping and physical damage.
- The compressed gases will be stored in an isolated storage area surrounded by crash posts to minimize potential for accidents or upset.
- Incompatible gases (e.g., flammable gases and oxidizers) will be stored in separate, isolated areas.
- Operators will be trained in the proper use of equipment and materials.

Water Treatment Chemicals

For the dry-cooled plant alternative, water treatment chemicals will be present in minimum quantities. Calcium hypochlorite and oxygen scavenger reagent are water treatment products that will be used in the boiler makeup water and auxiliary cooling tower application. Approximately 50 pounds of these products will be stored on-site and shipped to the site as required. Shipping and storing the products in the same container minimizes chemical transfers, and thus minimizes the chances of a spill. The toxicity of each mixture is moderate and they are classified as irritants and corrosives.

HTF

HTF is a synthetic hydrocarbon liquid mixture of diphenyl ether and biphenyl oxide. Dowtherm A, Solutia VP-1, and Therminol VP-1, are commercial products that have been used in concentrated solar trough plants to date. At present, the Proponent has indicated they intend to use Therminol VP-1 in the solar array and steam cycle of the proposed Project. The diphenyl/biphenyl oxide mixture is not classified as a hazardous material by the USDOT, nor is it listed under EPA CERCLA regulations. However, this material, when discarded, may be a hazardous waste as that term is defined by RCRA, 40 CFR 261.24, due to its toxicity characteristic. Biphenyl has a CERCLA Reportable Quantity of 100 lbs—the amount present in approximately 377 lbs (42 gallons) of Therminol. Therminol VP-1 is low odor, moderately toxic, a skin irritant, and a Class III-B combustible liquid.

Approximately 8,300 tons of HTF will be present in the heat transfer system, including the piping and necessary expansion tanks; no additional HTF will be stored on-site. The heat transfer system is a closed loop and the system pressure will be monitored continuously. The solar field will be regularly monitored by the operations staff using sight, sound, and smell to detect system leaks. Isolation valves will be installed throughout the solar field to minimize HTF loss in the event of a system leak. The isolation valves will be designed for automated operation triggered by a pressure drop in the system, or manual operation if a leak is detected by other means. The

Project is considering remote sensing equipment to allow for the detection of sudden large leaks. Leaks will be repaired promptly, and fluid spills will be cleaned up immediately.

Petroleum Products

In addition to petroleum products to be located within the on-site fuel depot, other petroleum products to be used within the solar facility include lube and insulating oil. Lube oil will be stored in a 10,000-gallon carbon steel tank and in equipment and piping associated with each steam turbine. The turbine enclosure will provide secondary containment sufficient to hold the full contents of the tank. The tank will be inspected daily to ensure that it is not leaking. Lube oil has low toxicity and does not meet the criteria for any hazard class defined by the Uniform Fire Code Diesel fuel will be used to fuel the emergency fire water pump engine. The fire water pump engine has a 300-gallon fuel supply in a carbon steel tank. The equipment skid provides secondary containment that can hold the full amount of the fuel. Diesel is a combustible liquid with low toxicity.

Insulating oil is used in the electrical transformers at the facility. The total quantity of insulating oil present at the facility will be 32,000 gallons. Each transformer is installed in a secondary containment structure that will contain 100 percent of the transformer capacity plus an allowance for precipitation.

Activated Carbon

The HTF expansion tank will be vented through a two-stage activated carbon system for the control of air emissions from the tank. Each stage of the system comprises a 2,000-lb capacity carbon canister. The facility will not maintain an inventory of additional carbon. New activated carbon has low toxicity; however, once in use, the activated carbon will adsorb VOC and toxic air contaminants, including benzene, diphenyl ether, and biphenyl, and the toxicity will increase. Activated carbon is difficult to ignite, but will smolder once ignited.

The emissions control system will be monitored periodically (with a frequency specified in the air operating permit) to determine the saturation level of the carbon. When saturated with VOC and toxic air contaminants, activated carbon is disposed of as a hazardous waste.

Herbicide

Herbicide will be used in the solar field to kill weeds in order to minimize the fire potential. The weed control program will be contracted to an outside contractor. Accordingly, herbicides will not be stored on site but will instead be brought on-site on an as-needed basis. The Proponent will ensure that the contractor has the appropriate licenses and a robust safety program for its employees.

The BLM is required to analyze the potential direct, indirect, and cumulative impacts of herbicide use on BLM-mananged land. In 2007, the BLM issued the Final Programmatic Environmental EIS titled Vegetation Treatments Using Herbicides (BLM 2007). The Programmatic EIS (PEIS) requires the BLM to develop a noxious weed risk assessment when it

is determined that an action may introduce or spread noxious weeds. Weeds present on or near the site are identified, a risk assessment completed, and weeds controlled as necessary adhering to standard operating procedures and mitigation measures. Standard operating procedures and mitigation measures for applying herbicides are identified for each resource and would be followed to minimize risks to human health and the environment. Mitigation measures identified in the PEIS apply to resources at the programmatic level in 17 western states; however, local BLM field offices must develop more site-specific mitigation and management plans (i.e., timing restrictions) based on local conditions and resource management goals. Herbicide treatments must comply with the U.S. EPA label directions and follow BLM procedures outlined in BLM Handbook H-9011-1 (Chemical Pest Control), and Manuals 1112 (Safety), 9015 (Integrated Weed Management), and must includes the development of a treatment plan prior to implementation. Table 4-42 lists active ingredients of herbicides that may be used at the Project site.

Table 4-42 List of Active Ingredients in Herbicide

Herbicide Active Ingredient	CAS No.	Acute Toxicity[1]	Carcinogen[2]	Water Solubility (mg/L)	Aerobic Soil Half-Life (average, days)	EPA Minimum Hazardous Air Poluntant[3]
2,4-D	94-75-7	Moderately	Unclassifiable	27,600	34	Yes
Bromacil	314-40-9	Unlikely	Possible	929	347	No
Chlorsulfuron	64902-72-3	Unlikely	Unlikely	28,300	28	No
Clopyralid	1702-17-6	N/A	Unlikely	106,000	152	No
Dicamba	1918-00-9	Slightly	Unclassifiable	27,200	10	No
Diuron	330-54-1	Unlikely	Likely	36	372	No
Fluridone	59756-60-4	Unlikely	Unlikely	N/A	N/A	No
Glyphosate	1071-83-6	Unlikely	Unlikely	11,600	96	No
Hexazinone	51235-04-2	Slightly	Unclassifiable	29,800	222	No
Imazapic	104098-48-8	N/A	Unlikely	259,000	1,200	No
Imazapyr	81334-34-1	Unlikely	Unlikely	10,500	507	No
Metsulfuron methyl	74223-64-6 5585-64-8	Unlikely	Unlikely	N/A	24	No
Picloram	1918-02-1	Unlikely	Unlikely	N/A	N/A	No
Sulfometuron methyl	74222-97-2	N/A	N/A	4,250	52	No
Tebuthiuron	34014-18-1	Slightly	Unclassifiable	2,600	1,220	No

Table 4-42 List of Active Ingredients in Herbicide

Herbicide Active Ingredient	CAS No.	Acute Toxicity[1]	Carcinogen[2]	Water Solubility (mg/L)	Aerobic Soil Half-Life (average, days)	EPA Minimum Hazardous Air Poluntant[3]
Triclopyr	55335-06-3	Slightly	Unclassifiable	N/A	N/A	No

[1] Source: World Health Organization Acute Hazard Rankings. May be: Extremely hazardous, Highly hazardous, Moderately hazardous, Slightly hazardous, Unlikely to be hazardous, or Not Classified. N/A indicates the information is not available.

[2] Source: U.S. EPA Office of Pesticide Programs Carcinogen List. May be: Possible, Unlikely, or Unclassifiable. Unclassifiable indicates there is not enough data to make a determination. N/A indicates the information is not available.

[3] Source: U.S. EPA Section 112 Hazardous Air Pollutants (http://www.epa.gov/ttn/atw/orig189.html).

4.13.1.6 Hazardous Material Transportation

Hazardous materials will be delivered to the Project site via truck along US 95 and then into the gated and fenced site via the Project access road. US 95, is a major north-south transportation route through Nevada and is currently used for the transport of hazardous materials; the Project will cause a small increase in hazardous material traffic along this route.

4.13.1.7 Off-Site Consequence Analysis

The propane storage tanks and handling facilities will be equipped with continuous tank level monitors, temperature and pressure monitors and alarms, and excess flow and emergency island valves. Only trained technicians will conduct system maintenance and repairs.

Delivery

Propane is typically delivered in 5,000-gallon tank trucks. The tank trucks will be unloaded in an unloading area immediately adjacent to the propane tanks. The unloading area will be paved with concrete and curbed. During unloading operations, the driver performing the unloading operation will wear appropriate protective equipment, and will have a cut-off switch to stop the propane transfer in case of an emergency. The offloading operation will also be monitored by a control room operator via camera to provide backup support if there is a leak, hose break, or other accident during unloading.

With respect to the transport of propane to the Project site, USDOT and NDOT regulations require all truck tank trailers to meet strict requirements for collision and accident protection. Hazardous materials shipments will comply with applicable regulations in terms of route selection, operator training and qualifications, etc. The tank trucks are designed to withstand violent accidents without breach of containment.

Storage

Storage of propane in an 18,000-gallon tank at each unit creates the potential for leak, spill, or rupture of the tank, releasing propane to the atmosphere. Propane is a flammable gas. Pressurized metallic storage tanks have a mean time to catastrophic failure of 0.0109 per million hours of service, or on average one failure every 10,500 years. Thus, failure of a pressurized propane tank during the lifetime of the facility is unlikely. Additionally, the storage tank will be protected by concrete curbing and steel columns to reduce the likelihood of accidental vehicle impacts.

4.13.1.8 Facility Fire and Explosion Risks

The proposed Project will utilize two materials that pose potential risks of fire and explosion because of their flammability. These are propane and HTF, each of which is discussed below. Propane will be used as a fuel for the two boilers at the facility and poses a fire and/or explosion risk as a result of its flammability. Propane will be delivered to the site weekly by trucks owned and operated by a licensed vendor and will be stored on-site in an 18,000-gallon above ground storarge tanks at each power block. The HTF at high temperatures can also present a fire hazard.

An on-site fire protection system, designed in conformance with the International Fire Code 2006 edition with Nevada State Fire Marshal Amendments, would be provided to limit personnel injury, property loss, and downtime in the event of a fire. The system would include a fire protection water system and portable fire extinguishers. Separate fire flow storage tanks would be sited within each of the two power blocks and an additional storage tank may be required for the Assembly Hall depending upon the final location of the structure. Firewater would be sourced from the Project well, and would be pumped to the site and stored in tanks for fire suppression. On-site fire pumps would be required to deliver water to the fire protection piping network for each of the buildings located within the power blocks.

The piping network would be configured in a loop so that a piping failure could be isolated with shutoff valves without interrupting water supply to other areas in the loop. Fire hydrants would be placed at intervals throughout the plant site that would be supplied with water from the supply loop. The water supply loop also would supply firewater to a sprinkler deluge system at each unit transformer, HTF expansion tank and circulating pump area and sprinkler systems at the steam turbine generator and in the administration building.

Fire protection for the solar field would be provided by zoned isolation of the HTF lines in the unlikely event of a rupture that results in a fire. Since vegetation and other combustible materials would not be present in the solar field area, the HTF would be allowed to self extinguish.

A Construction Fire Protection and Prevention Plan will be developed and followed throughout all phases of construction. The permanent facility fire protection system would be put into use during construction as soon as is practicable. Prior to the availability of this system, fire extinguishers and other portable fire-fighting equipment would be available on site. All equipment would be OSHA compliant. Locations of portable firefighting equipment may include portable office spaces, welding areas, flammable chemical areas, and vehicles and other mobile equipment.

Finally, as per the Nye County Development Agreement (Appendix F): "Developer shall annually, for as long as the ASPP is operating, provide emergency and fire protection training for up to four (4) individuals identified by County. County shall give priority to individuals who serve in the Amargosa Volunteer Fire Department. Such training shall be the equivalent of training provided to Developer's on-site personnel." In addition, the "Developer shall provide County, in a location selected by Developer, for as long as the ASPP is operating, access to a water supply for County's use in responding to fires within the Town of Amargosa. County agrees to utilize the water supply only for such purposes."

4.13.1.9 Wildland Fire Management and Fuels Consideration

No short-term effects or concerns are expected with regards to wildland fire. Long-term effects or activities which promote invasive species such as an increase to the water regime or change to soil characteristics may increase wildland fire risk. Wildland fire risk within the proposed Project area will be mitigated by the preparation and adherence to the Weed Management Plan.

Due to the lack of vegetation in the Project area, spacing between existing vegetation, and a lack of continuous fine fuels such as invasive annual grass, there are no apparent wildland fire risk to the Project or adjacent area based on fire history. Annual grass growth is dependent on seasonal precipitation which can vary from year to year. The creosote-bursage vegetation types do not commonly burn with active fire spread unless fine fuels are present.

Windblown vegetation such as Russian thistle found in adjacent agricultural lands in the area may accumulate along fences, roadways, and ditches and may present a fuels hazard to the site. Such accumulations should be managed to reduce fire risk.

4.13.1.10 Seismic Risk

The possibility exists that an earthquake could cause the failure of a hazardous materials storage tank or HTF piping somewhere in the solar field. An earthquake could also cause the failure of the secondary containment system (berms and dikes), as well as electrically controlled valves and pumps.

The failure of all these preventive control measures might then result in a leak or discharge of hazardous materials. Due to the limited types and quantities of hazardous materials to be stored on-site and the sparsely inhabited surroundings, it is unlikely that hazardous materials could move off the site and impact residents and workers in the surrounding area.

The piping in the solar array contains the vast majority of the HTF and the solar field will not be constructed with secondary containment. However, it is very unlikely that an earthquake could cause the failure of the piping in the solar array, resulting in a loss of HTF that would have an off-site impact.

The piping in the solar array will be specifically constructed to allow movement due to thermal expansion – the steel piping in the mirrored trough sections of the array is connected to the HTF distribution headers with ball joints and the piping is not rigidly mounted to foundations or other structures. Furthermore, the solar array will be constructed with isolation valves to limit the HTF

losses in the event of a piping failure. Due to these inherent design features, piping failures during seismic events are not likely and do not represent a significant risk to the public.

4.13.2 Wet-Cooled Alternative

The primary difference between a dry- and wet-cooled solar thermal plant is the additional amount of water-treatment chemicals needed to treat the larger volume of water required for a wet-cooled solar thermal plant. The wet-cooled alternative would require a treatment system 10 times larger than the dry-cooled alternative, with a corresponding increase in the amount of required treatment chemicals.

Under the wet-cooled plant alternative, water conditioning chemicals would be mixed with the makeup water to minimize corrosion and inhibit mineral scale formation. In addition to other water conditioning additives, sulfuric acid will be fed into the circulating water system for alkalinity reduction to control the tendency for mineral scaling in the circulating water. The sulfuric acid is supplied in an amount proportional to the circulating water makeup flow. All water conditioning additives will require separate storage tanks and metering equipment. For the sulfuric acid system, which is the chemical added in the largest quantities, the feed equipment would consist of a bulk storage tank and two acid metering pumps. Delivery, storage, and use of these additional chemicals would introduce manageable, but new risks not present with the dry-cooled alternative.

4.13.3 No Action Alternative

Under the No Action Alternative, the BLM would not grant the right-of-way and the potential impacts from construction and operation of the proposed Project would not occur.

4.13.4 Mitigation

Mitigation measures for the use, storage, and disposal of hazardous materials is provided in Appendix A.

4.14 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

The CEQ's regulations state in 40 CFR 1502.16 that the discussion of environmental consequences include the ". . . environmental impacts of the alternatives including the proposed action . . . and . . . any adverse environmental effects which cannot be avoided should the proposal be implemented . . . ." While all environmental effects that may result from BLM's granting of the right-of-way are discussed in Section 4.0 of this document, this section summarizes the significant environmental effects for the Proposed Action and alternatives that cannot be avoided.

Unavoidable adverse impacts are those that would occur after implementation of all committed and recommended mitigation. Unavoidable impacts do not include temporary or permanent

impacts that would be mitigated. They also do not include impacts from speculative events such as hazardous waste spills that are not cleaned up promptly in accordance with accepted industry standards or regulatory requirements.

The Proponent has committed to implementing mitigation measures in its Project design to avoid or minimize potential impacts from construction and operation of the Proposed Action. Implementation of Proponent-committed environmental protection measures, and adherence to stipulations associated with any required federal, state, or local permit or approval, would reduce unavoidable adverse impacts on the human and natural environment.

Unavoidable adverse environmental impacts include the direct and cumulative impacts from the loss of up to 4,350 acres of desert habitat and native vegetation for the life of the Project. In addition, construction of the proposed Project would cause unavoidable short-term and long-term adverse impacts on visual resources by disrupting the viewshed in the Project area. However, the overall change in the landscape would not exceed the VRM class standards set for the area by the Las Vegas RMP.

4.15 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

This section describes the irreversible and irretrievable commitments of resources associated with construction and operation of the proposed Project. A commitment of resources is irreversible when primary or secondary impacts limit the future options for a resource. An irretrievable commitment refers to the lost production or use of a resource that would cause the resource to be unavailable for use by future generations. Examples of these types of resources include nonrenewable resources, such as minerals and cultural resources, and renewable resources that would be unavailable for the use of future generations such as loss of production, harvest, or habitat.

Implementation of the proposed Project would result in the consumption of energy as it relates to the fuel needed for construction-related activities. Large amounts of gasoline and diesel petroleum products would be required for Project construction. Additionally, construction would require the manufacture of new materials, some of which would not be recyclable at the end of the lifetime of the proposed Project. The raw materials and energy required for the production of these materials would also result in an irretrievable commitment of natural resources. Operation of the proposed Project would not cause a substantial increase in the consumption or use of non-renewable resources.

Implementation of the proposed Project would result in the loss of over 4,350 acres of vegetation and habitat. The loss of this habitat would be long-term. Following decommissioning, restoration would be conducted which would involve removal of structures, restoration of topography, and revegetation, all of which would work towards restoration of habitat. However, it is likely that restoration of native vegetation would be slow, and the success uncertain. Therefore, the loss of onsite Desert Tortoise habitat is assumed to be permanent since the restoration of vegetation on which Desert Tortoise depend for foraging, and other factors affecting the quality of the restored habitat, are uncertain. Compensatory mitigation would serve to indirectly mitigate this impact.

Per the stipulated agreement with the NPS, USFWS, and the BLM, the Proponent must acquire no less than 236 afy of senior groundwater rights in the vicinity of the Project well, or closer to Devils Hole and Ash Meadows NWR. These water rights are in addition to the water needed for Project construction and operations (600 afy during the 39-month construction period; 400 afy during operations). During the 39-month construction period, up to 836 afy of existing water rights will be used for Project-related uses or mitigation. During operations, up to 636 afy of existing water rights will be used for Project operations and mitigation. The 236 afy consists of 204 afy identified as "Minimization Water Rights" (see Appendix A), and an additional 32 afy to offset the potential reduction in groundwater return flow as a result of changing the manner of use from agricultural to industrial. The Proponent would sign over the minimization water rights (204 afy) to Nye County upon a signed Memorandum of Understanding (MOU). Though details yet to be determined by the MOU, Nye County, in cooperation with the other MOU signatories and other appropriate agencies shall perform studies to better understand how the use of the minimization water rights would impact area resources. These include Devil's Hole, Ash Meadows, and overall local and regional water levels. The details and ultimate goals of the studies shall be agreed upon by Nye County, BLM, NPS, and USFWS.

The majority of access required for construction and operation of the proposed Project would utilize existing public rights-of-way and access roads. The proposed Project would require re-routing the existing Amargosa Farm Road, but the re-routed road would re-connect with the existing road to the west of the facility.

Construction and operation of the proposed Project would require the use of a limited amount of hazardous materials such as fuel, lubricants, and cleaning solvents. All hazardous materials would be stored, handled, and used in accordance with BMPs and applicable, federal, state, and local regulations, including a construction-phase SWPPP and an operational phase SWPPP. Assuming appropriate implementation of these plans and practices as are recommended in the conditions of certification, potential degradation of the environment due to accidental spills associated with the proposed Project's use of hazardous materials would not occur.

Visual impacts would be significant and long-term considering the context and intensity of the Project effects in general. Intensity of potential effects involves the unique scenic characteristics of the local landscape as indicated by the rural character of the Project viewshed; concerns expressed by public commenters to date; a degree of uncertainty as to the level of discomfort or disability glare from parabolic mirrors; and concern over cumulative visual effects of renewable projects in the Amargosa Valley as a whole. The loss of visual quality would be long-term, enduring throughout the proposed 30-year lifespan of the facility. After the end of the Project's useful life, it would be decommissioned per BLM requirements, to be further described in the Applicant's Decommissioning Plan.

As part of the decommissioning process, the facility would be removed to a depth of approximately 5 feet below grade, original contours restored, and the site revegetated. However, the removal of the existing facility would leave a very prominent visual impact over the entire site due to the strong color contrast created between graded, disturbed soil areas and undisturbed soil areas in the vicinity of the Project site, at least until revegetation occurs. Revegetation of areas in this desert region is difficult and generally of limited success, at least in the near term.

Thus, visual recovery from land disturbance of closure and decommissioning would likely occur only over a very long period of time.

4.16 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY OF THE ENVIRONMENT

NEPA requires consideration of the relationship between short-term uses and long-term productivity of the environment (40 CFR 1502.16). This section discusses the short-term use of the local environment and the maintenance and enhancement of long-term productivity as a result of construction of and operation of the proposed Project.

For the purposes of this discussion, "short-term"is defined as the period from the onset of construction activities through the initiation of project operation. "Long-term" is defined as the entire operational life of the solar energy plant, which is anticipated to be 30 years or more.

4.16.1 Short-Term Uses

The proposed short-term uses of the natural environment associated with the Proposed Action are the development of about 4,350 acres of land for the footprint of the proposed solar power plant and ancilliary facilities; the consumptive use of approximately 600 afy of groundwater over a 39 month construction period; the fallowing of up to 120 acres of farmland, and the direct loss of vegetation and wildlife habitat. Short-term effects on the natural environment would result from land-clearing and construction activities. These would be related primarily to soil disturbance and air quality effects from site clearing and grading, and an increase in noise and traffic in the local area.

Short-term effects on social and economic resources would include an increase in revenue for some local businesses such as construction suppliers, hotels, restaurants, gas stations, and grocery stores.

4.16.2 Long-Term Uses

Approximately 4,350 acres of land would be permanently converted to utility uses, and flora and fauna within the Project footprint would be permanently removed. Disturbances of previously undisturbed biological habitats could result in long-term reductions in the biological productivity of the area, as biological communities in arid regions tend to recover very slowly from disturbances. Longer term effects include the permanent loss of some visual quality from the introduction of the solar plant and ancillary facilities and the consumptive use of approximately 400 afy of groundwater over a 30 year period. The conversion of 400 afy of groundwater from agricultural use to industrial use, would result in the fallowing of up to 80 acres of farmland. The additional 236 afy will either be converted to other water right uses or retired per the stipulation agreement between the NPS, USFWS, BLM, and Proponent (see Appendix A), If the 236 afy of existing water rights are retired, an additional 47 acres of farmland in the Amargosa Valley would be fallowed.

4.17 CUMULATIVE IMPACTS

4.17.1 Regulations and Guidance

The CEQ (40 CFR § 1508.7) defines "cumulative impact" as: "...the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions."

These actions include current and projected area development, management activities, and authorizations on public or private land, land use trends, and applicable industrial/infrastructure components. Although the individual impacts of each separate project may not be significant, the additive effects of multiple projects could be. These past, present, and reasonably foreseeable future actions are analyzed to the extent that "they are relevant and useful in analyzing whether the reasonably foreseeable effects of the agency proposal for action and its alternatives may have an additive and significant relationship to those effects."

The U.S. DOI and, more specifically, the BLM are seeking opportunities to develop renewable energy resources on federal land. The BLM's policy is to encourage development of renewable energy projects on BLM land consistent with the National Energy Policy of 2001 and the EPAct. In furtherance of that goal, the BLM completed a PEIS assuring a common direction and policy for permitting wind facilities on public land. The BLM, together with the DOE, is currently preparing a Solar Energy PEIS that will serve the same purpose. The BLM is considering whether to establish an agency-wide solar energy development program to supplement or replace existing policy, and whether to amend land use plans in the six-state study area to adopt the new program. The agency also expects to identify BLM-administered land in California, Arizona, Colorado, New Mexico, Nevada, and Utah that may be environmentally suitable for solar energy development, as well as land that would be excluded from such development. The PEIS will consider whether designation of additional electricity transmission corridors on BLM-administered land is necessary to facilitate utility-scale solar energy development. Similarly, through this PEIS the DOE is considering a program of solar energy environmental policies and mitigation strategies as guidance to all DOE-funded solar projects.

The Solar PEIS is not intended to eliminate the need for site-specific environmental review for individual utility-scale solar projects. Site-specific environmental reviews are expected to be tiered to the PEIS and to be simplified and improved by it.

Under the No Action PEIS alternative, the DOE and the BLM would continue to evaluate solar energy projects on a case-by-case basis. Under the proposed action, the BLM and DOE would create a reasonably foreseeable development scenario to define the potential for future utility-scale solar energy development activities over a 20-year study period. The release of the Draft Solar Energy Development PEIS was originally scheduled for spring of 2009. However, BLM and DOE decided to postpone completion of the Draft PEIS so that the PEIS could be made consistent with a U.S. DOI policy goal of identifying and prioritizing the specific locations best suited for large-scale solar energy production. The BLM solicited public comment on the 24 tracts of BLM-administered land identified for in-depth study for solar development. The draft PEIS is still under development, and will not be released for several additional months at the

earliest. For this reason, the PEIS is not available to provide guidance for the preparation of cumulative impacts analysis in this EIS, and that analysis must be conducted separately.

4.17.2 Methodology for Assessing Cumulative Impacts

Information about past, present, and reasonably foreseeable future activities in the cumulative resource ROI were gathered from the BLM, USFWS, Nye County, and other agencies; adopted plans; environmental documents; and personal communications with public agencies and utility companies.

The approach to cumulative impacts of the proposed Project considers "past" or "existing" projects to be those that have completed construction and are in operation. "Present" projects include those that are currently under construction or have been fully permitted such that they are likely to be part of the existing environment when the proposed Project would begin construction. "Reasonably foreseeable" future projects are those for which a formal permit application has been filed. The working definition of "reasonably foreseeable" projects on BLM land is based on whether or not a draft or final POD has been filed with the BLM by an applicant.

The proposed Project is most likely to have potential cumulative impacts when viewed together with other large-scale renewable energy projects given their similar direct and indirect impacts. As such, the cumulative impacts analysis in this Final EIS focuses primarily on other renewable energy projects, but other types of projects that may impact resources are considered as well. Table 4-43 lists existing and reasonably foreseeable commercial projects within the Amargosa Valley.

Table 4-43 List of Projects Considered Within or Near Amargosa Valley

Project Name	Project Description	Project Type	Status	Cumulatively Affected Resources
Existing Projects				
Nevada Joe's	Restaurant, brothel, gas station, helicopter pad, and convenience store	Commercial	Existing	Socioeconomics, Traffic
Alamo Fireworks	Fireworks store	Commercial	Existing	Socioeconomics, Traffic
Amargosa Valley Community Complex	Emergency services center, library, medical clinic, senior center, park, cemetery, rodeo grounds, AVIA Community Center and Raceway, and Amargosa Valley School	Public services, medical, and recreational.	Existing	Socioeconomics, Traffic, Noise, Air Quality, Visual
Horizon Academy	Private boarding school	Education	Existing	Socioeconomics, Traffic, Visual
First International Bank	Bank	Commercial	Existing	Socioeconomics, Traffic, Visual
Longstreet Hotel and Casino	Hotel, casino, RV resort, 9-hole golf course, and restaurant	Commercial and Recreational	Existing	Socioeconomics, Traffic, Water Resources, Noise, Visual
Ruby's Store	Grocery/convenience store	Commercial	Existing	Socioeconomics, Traffic, Visual
State Line Saloon	Dining, RV Park, golf course, convenience store, and lounge	Commercial	Existing	Socioeconomics, Traffic
Church of Amargosa	Church Facilities	Religious	Existing	Socioeconomics, Traffic, Visual
Ponderosa Dairy	Dairy farm covering approximately 1,800 acres	Agriculture	Existing	Socioeconomics, Water Resources, Air Quality, Visual, Noise
Valley Substation	Electrical substation and related facilities	Utilities	Existing	Socioeconomics, Visual

Table 4-43 List of Projects Considered Within or Near Amargosa Valley

Project Name	Project Description	Project Type	Status	Cumulatively Affected Resources
Transmission Line	VEA is the holder of a ROW for a 138 kV line near/on the Project area	Utilities	Existing	Socioeconomics, Visual
Telephone Line	Nevada Bell is the holder of a ROW for a telephone line near the Project area	Utilities	Existing	None
IMV Nevada Mining	Mining claims on 10,000 acres for specialty clays	Mining	Existing	Socioeconomics, Soils, Water Resources, Air Quality, Visual
Cinder Cone Mine	Volcanic-mineral material mining (pumice and cinder)	Mining	Existing	Socioeconomics, Water Resources, Air Quality, Visual
Sand and Gravel Pit	Sand and gravel pit mining	Mining	Existing	Socioeconomics, Soils, Water Resources, Air Quality, Visual, Noise
Big Dune	Primarily an OHV recreation area	Recreation	Existing	Socioeconomics, Soils, Air Quality, Visual, Noise, Recreation, Traffic
Foreseeable Future Projects				
VEA Transmission Line Upgrade	Upgrade transmission line from a 138 kV to a 230 kV line and build a new 230 kV switchyard	Utilities	Proposed	Socioeconomics, Visual, Air Quality, Temporary Construction Noise, Temporary Construction Traffic
Renewable Energy Transmission Company (Solar Express Project)	Proposed 120 mile 500kV transmission line that will connect solar energy generation in the Amargosa Valley, Nevada with the Marketplace, Eldorado, McCullough substation complex in southern Nevada	Utilities	Right-of-way Pending	Socioeconomics, Visual, Air Quality, Temporary Construction Noise, Temporary Construction Traffic

Table 4-43 List of Projects Considered Within or Near Amargosa Valley

Project Name	Project Description	Project Type	Status	Cumulatively Affected Resources
Abengoa Solar Inc. Lathrop Wells Solar Facility. NVN-086571; filed 12/12/2008; 5,280 acres.	Proposed 250 MW parabolic-trough, dry-cooled solar power plant with the option to expand the facility by adding a second 250 MW unit. Additionally, the proposal may include up to 20 MW of photovoltaic solar power. Notice of Intent to prepare an EIS published in the Federal Register on July 15, 2010. Scoping meetings held August 2010. Located southwest of the intersection of US 95 and Hwy 373; approximately 2-3 miles northeast of the proposed Project.	Utilities	Right-of-way Pending	**Construction Impact:** Air Quality; Biology; Cultural; Hazard Materials; Water Resources; Noise; Recreation; Soils, Socioeconomic; Traffic **Operational Impact:** Biology; Land Use; Water Resources; Soils, Recreation; Socioeconomic
Amargosa Flats Energy, LLC (Ausra). NVN-084704, filed 03/12/2008.	Proposed 140 MW linear fresnal solar power plant. No POD available for review. Located east of Highway 160.	Utilities	Right-of-way Pending	**Construction Impact:** Air Quality; Biology; Cultural; Hazardous Materials; Water Resources; Noise; Recreation; Socioeconomic; Traffic, Soils **Operational Impact:** Biology; Land Use; Hydrology; Recreation; Socioeconomic

Table 4-43 List of Projects Considered Within or Near Amargosa Valley

Project Name	Project Description	Project Type	Status	Cumulatively Affected Resources
Cogentrix Solar (seven separate right-of-way applications on BLM parcels totaling 74,477 acres throughout Amargosa Valley. Right-of-way applications filed in 2007 and 2008 with the BLM Pahrump Field Office. Many of these application are overlapping or "second in line" applications.	Seven separate right-of-way applications for the construction and operation of solar thermal power plants throughout Amargosa Valley. No POD's available for review. NVN-083220, 12,800 acres; NVN 083221, 22,400 acres; NVN-085656, 7,500 acres; NVN-085657, 7,700 acres; NVN 083150, 13,440 acres; NVN-085654, 3,597 acres; NVN-085602, 7,040 acres	Utilities	Right-of-way Pending	**Construction Impact:** Air Quality; Biology; Cultural; Hazards; Water Resources; Noise; Recreation; Soils, Socioeconomic; Traffic **Operational Impact:** Aesthetics; Biology; Land Use; Water Resources; Recreation; Socioeconomic, Soils
EwindFarm Inc. NVN 088156; filed 12/16/2009; 50,470 acres NVN 085201; filed 5/14/2008; 11,238 acres	Proposed 8 gigawatt solar energy project on the DOE Yucca Mountain, Nevada Test Site. No POD available. Proposed 500 MW photovoltaic flat plate facility near the Johnnie substation north of Pahrump along SR 160. No POD available.	Utilities	Right-of-way Pending	**Construction Impact:** Air Quality; Biology; Cultural; Hazards; Water Resources; Noise; Recreation; Soils, Socioeconomic; Traffic **Operational Impact:** Biology; Land Use; Water Resources; Recreation; Socioeconomic, Soils
Nye County Solar One, LLC. NVN-086217; filed 09/29/2008; 14,160 acres.	Proposed 300 MW parabolic trough solar plant. No POD available for review. Project located near Highway 160.	Utilities	Right-of-way Pending	**Construction Impact:** Air Quality; Biology; Cultural; Hazard Materials; Water Resources; Noise; Recreation; Socioeconomic; Traffic **Operational Impact:** Biology, Water Resources; Land Use, Socioeconomic

Table 4-43 List of Projects Considered Within or Near Amargosa Valley

Project Name	Project Description	Project Type	Status	Cumulatively Affected Resources
Pacific Solar Inc., c/o Iberdrola Renewables Amargosa North - NVN-084465; 10,005.53 acres; filed 12/07/2007; Amargosa South - NVN-084466; 4,480 acres; filed 12/07/2007.	Proposed 150 MW photovoltaic solar plant(s). Notice of Intent to prepare an EIS published in Federal Register on December 14, 2009. Scoping meetings held January 2010. Project located near Big Dunes, approximately 2-3 miles northwest of proposed Project.	Utilities	Right-of-way Pending	**Construction Impact:** Air Quality; Biology; Cultural; Hazards; Water Resources; Noise; Recreation; Soils Socioeconomic; Traffic along Valley View Boulevard **Operational Impact:** Biology, Water Resources; Land Use, Socioeconomic; Traffic along Valley View Boulevard
Altagas Renewable Energy/Rhyolite Energy Park; NVN-084067; filed 08/30/2007	Met tower installation approved. Pending Wind Energy facility if wind data is viable. Project located near Beatty.	Utilities	Approved (Met tower installation only)	**Construction Impact:** None **Operational Impact:** None

4.17.3 Geographic Context for Cumulative Analysis

Cumulative impacts occur in a geographic context; but the area over which cumulative effects potentially would be of concern varies for different environmental resource areas. For example, noise and vehicular traffic impacts usually are evaluated in localized terms, impacts on protective services and utilities require evaluation of larger service areas, and the scope of water resources and air quality impacts can involve an entire groundwater basin and/or be affected by topographic features (e.g., mountains). In short, the scope of cumulative impacts evaluations varies spatially, with the variability based on the nature of the environmental resource area being considered.

While the discussions in the various environmental resource areas often consider a broad regional perspective, the specific projects that are the primary focus of the cumulative analyses in this EIS are proposed projects identified between Beatty and Highway 160, basically the Amargosa Valley in Nevada. These proposed projects are shown on Figure 4-12.

In addition, cumulative impacts analysis must consider the variable of time as well as geography. The length of time for cumulative effects analysis varies according to the duration of impacts from the Proposed Action on the particular resource. The timeframe for the cumulative impact analysis begins at the time of Project construction (assume 2011, if the Project is approved) and extends sufficiently forward in time with consideration of past trends and activities on current and reasonably foreseeable future actions and trends that may affect the sustainability of the resource.

In some resource areas, the overlap in project construction schedules is particularly important because potential impacts that are enhanced by large overlapping construction work forces (e.g., impacts on traffic and socioeconomic conditions and infrastructure) could be considerable. However, these impacts are short-term and temporary because solar project operation-phase work forces are small compared to the construction phase.

4.17.4 Cumulative Projects

The focus of the cumulative analyses in this EIS is to evaluate the potential impacts of the proposed Project combined with impacts of past, present, and reasonably foreseeable projects within the Amargosa Valley in Nevada.

4.17.4.1 Past Actions

Approximately 92 percent of the land in Amargosa Valley is public land, with the remaining 8 percent of private lands scattered throughout the Valley. Past actions in the area include agricultural development, including farming and dairy operations: isolated mining exploration in the surrounding desert and mountains: isolated pockets of commercial and residential development and associated road and utility infrastructure construction and operation: and recreational opportunities in the surrounding desert and mountain areas, including Big Dunes, Ash Meadows NWR, and Funeral Mountain Wilderness Area. Military and defense related

activities have occurred, and are ongoing, at the Nevada Test Site, Nevada Test and Training Range, and the proposed Yucca Mountain Nuclear Waste Repository.

Existing residences, businesses, and public facilities are clustered in various locations in the Amargosa Valley. These include the highway commercial center at the junction of US 95 and NV 373; the commercial and residential area near the California/Nevada border along NV 373; and the Amargosa Valley Community Complex, which includes the community center and town offices, the emergency services center and sheriff's substation, a town library, the health clinic, a senior center, and the Amargosa Valley School. Isolated pockets of residential development are interspersed in the Amargosa Valley Community Complex primarily north of Amargosa Farm Road and east of Sandy Lane. The majority of land development evolved around agricultural uses, and commercial activity evolved around the main roads through the valley (Amargosa Valley Area Plan 2009).

Existing utility facilities in the project area include electrical distribution and transmission lines owned and operated by VEA, and fiber optic and telephone lines owned by Nevada Bell. In addition, there are three operating cellular towers in the valley. Most of the higher voltage electrical transmission lines were installed in the early 1960s, with distribution lines installed as development increased in the Amargosa Valley.

There are seven private water systems throughout the valley and only four communal sewer systems. Most residents in the Amargosa Valley rely on individual wells and septic systems. The town of Amargosa Valley does not forecast expansion of private water systems or communal sewer systems to serve the broader community (Amargosa Valley Area Plan 2009).

4.17.4.2 Reasonably Foreseeable Future Actions

Reasonably foreseeable future projects considered in this EIS are shown on Figure 4-12, and are summarized in Table 4-42. Each of the projects was evaluated to determine if it is sufficiently defined (reasonably foreseeable) to be: (1) relevant to potential impacts, (2) within the Project area of influence, and (3) of a magnitude or duration that could potentially result in a cumulative impact.

Renewable Energy Development

In a broad geographic context, the BLM has received more than 220 applications for utility-scale solar energy projects in California, Nevada, Arizona, New Mexico, Colorado, and Utah. These applications cover more than 2.3 million acres of land. There are also hundreds of applications for utility-scale wind and geothermal energy projects on BLM land in the western United States. In addition, there are an unknown number of renewable energy development projects being proposed on private lands throughout the Southwest. Regional cumulative impacts could occur as a result of implementation of the proposed Project in conjunction with these solar, wind, or geothermal energy projects.

There are uncertainties in any large-scale, complex, and costly industrial project as it moves from concept toward realization. However, the level of uncertainties with some of the proposed renewable energy projects in the desert Southwest is unusually great. Cumulative analysis under NEPA requires consideration of the likelihood that the proposed projects actually will occur. To

quote the California Energy Commission Staff in the Ivanpah Solar Electric Generation System Preliminary Staff Assessment:

"[While there is]...a very large number of applications to BLM, it is unlikely that all of these projects will be constructed for the following reasons:

- Not all developers will develop the detailed information necessary to meet BLM and Energy Commission standards. Most of the solar projects with pending applications are proposing generation technologies that have not been implemented at large scales. As a result, preparing complete and detailed PODs is difficult, and completing the required NEPA and California Environmental Quality Act documents is especially time-consuming.

- After approval by the appropriate Lead Agency under California Environmental Quality Act (only applies to California projects) and NEPA (generally the CEC and/or BLM), all permits must be obtained. The large size of these projects may result in permitting challenges related to endangered species mitigation requirements, and other issues.

- Also after project approval, construction financing must be obtained (if it has not been obtained earlier in the process). The availability of financing will be dependent on the status of competing projects, the laws and regulations related to renewable project investment, and the time required for obtaining permits."

In addition, the proposed renewable energy projects, whether proposed on public or private land must successfully compete for Power Purchase Agreements with utility organizations that are working to meet their state-mandated Renewable Portfolio Standards.

Within the cumulative effects analysis area (Amargosa Valley), there are 10 proposed solar facilities and one proposed wind project. As of September 2010, BLM-approved PODs have been filed for only two of the proposed solar and wind projects within the cumulative impact study area. A NOI to prepare an EIS for the Pacific Solar Investment, Inc. – Amargosa North Solar Power Project was published in the Federal Register on December 14, 2009. Scoping meetings for this Project were held January 19–21, 2010. The proposed project, would consist of solar photovoltaic panels, including an electrical transmission substation and switchyard facilities. The proposed project would produce approximately 150 MW of electricity and would be located on approximately 2,356 acres within a 7,500 right-of-way on public lands managed by the BLM Pahrump Field Office (See Figure 4-12).

On July 15, 2010, an NOI to prepare an EIS for the Abengoa Solar – Lathrop Wells Solar project was published in the Federal Register. The proposed project would consist of a concentrated solar power facility—including a solar parabolic trough, photovoltaic panels, an electrical transmission substation, switchyard facilities, and a transmission line. The project would produce approximately 250 MW from a parabolic-trough, dry-cooled solar power plant with the option to expand the facility by adding a second 250 MW unit. Additionally, the proposal may include up to 20 MW of photovoltaic solar power. The proposed project would be located on approximately 5,336 acres of public land immediately north of the proposed Project that is the subject of this Final EIS. Scoping meetings for the Lathrop Wells Solar project were held in mid-August 2010.

Various renewable energy developers have submitted right-of-way applications to the BLM but have not advanced their planning process beyond the initial application stage. There are several solar developers who have submitted applications to the Pahrump BLM Field Office that are "second in line," meaning that they proposed development of sites for which applications have already been submitted. The proponents have not submitted detailed Project-specific information for these projects, but only basic information such as type of technology to be used, proposed size, and requested acreage. This information is publicly available on BLM's LR-2000 database. In an effort to be conservative, the available data were used to evaluate the potential cumulative effects when considered with the proposed Project even though these projects, ultimately may not be developed.

Electrical Transmission

The West-Wide Energy Corridor PEIS has delineated energy corridors running through the region, including proposed corridors that parallel US 95 north of the Project area. Electric transmission providers are evaluating various transmission line alternatives in the Amargosa Valley area; however, to date, no formal applications have been filed with either the BLM or the Public Utilities Commission of Nevada.

NV Energy submitted a Statement of Interest (SOI) in response to the Western Area Power Administration (Western) Request for Interest dated March 4, 2009. NV Energy submitted the SOI for the potential joint development and construction of 500kV transmission lines and associated facilities to access renewable energy resources within Nevada and deliver the power from those resources to Nevada and other markets in the southwest (Renewable Energy Transmission Access Advisory Committee 2009). The NV Energy proposal is for a phased approach to match the demand for renewables with actual resource development. Their SOI identified four separate phases. Phase I would consist of a 500 kV line extending from NV Energy's existing Harry Allen 500 kV substation north of Las Vegas to its Northwest Substation. From there the line would extend northward to a new collector substation in the Amargosa Valley. Phase II and III, would be interchangeable or concurrent depending on demand and Western's and NV Energy's wants and needs. Phase II could extend south from a proposed Desert Rock Station to Western's Mead substation south of Boulder City. Phase III would extend north from the Amargosa Valley to NV Energy's Blackhawk Substation in northern Nevada. Finally, Phase IV could be an option to extending into the Transmission Agency of Northern California if Western so desired.

In consideration of NV Energy's SOI, and as part of their long-term planning to support renewable energy development in the Amargosa Valley, VEA intends to upgrade its existing transmission lines in their service territory. The first phase would include the upgrade of an existing transmission line located south of US 95 and west of US 160 from 138kV to 230kV. The second phase would be the construction of a new 230kV line from the VEA substation at the corner of Powerline Road and Anvil Road to the existing Valley Switching Station. The line would then parallel VEA's existing 138kV transmission line to the proposed Johnnie Substation. VEA is currently performing system impact studies based on interconnection requests to determine whether other upgrades are required to accommodate future load growth. VEA will file a right-of-way application or update to accommodate these upgrades, and the BLM will prepare a separate NEPA review of VEA proposed action.

In a separate action, Renewable Energy Transmission Company has filed a right-of-way application to construct, operate, and maintain a 120-mile long 500kV transmission line to connect new renewable energy generation in the Amargosa Valley to energy markets in southern Nevada and California. The proposed transmission line, known as the Solar Express Project, will be subject to separate NEPA review and studies.

4.17.5 Evaluation of Potential Cumulative Impacts

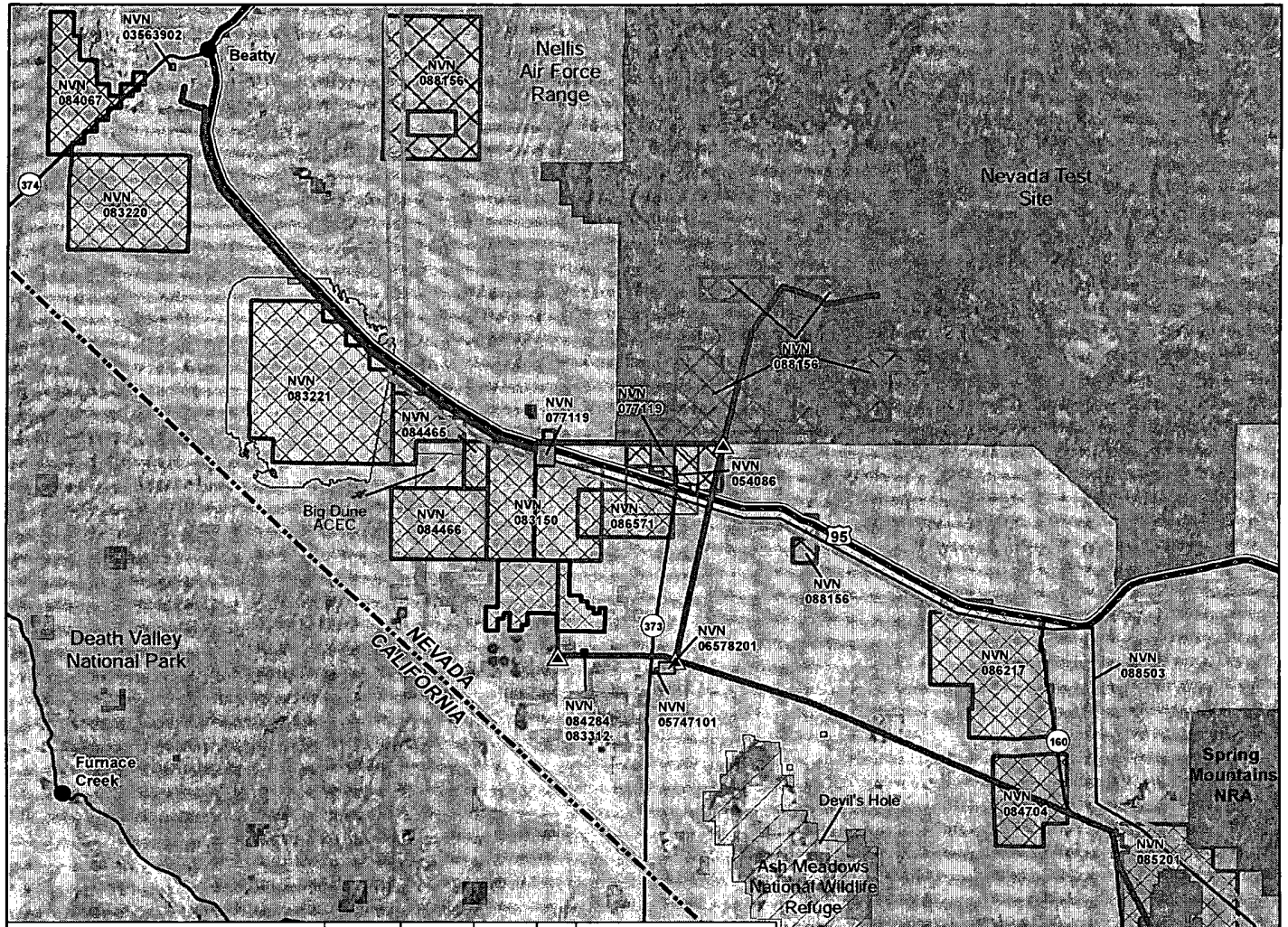
The following sections provide an analysis of potential cumulative impacts related to the Proposed Action on each resource when viewed in conjunction with other past, present, and reasonably foreseeable actions in the cumulative impact study area. This analysis considers the anticipated additive effect that the Proposed Action would have to cumulative impacts after BLM-approved mitigation measures are implemented.

Because many of the renewable energy projects are in the early stages of development, there are limits to understanding whether and how those projects' direct and indirect impact may combine with the proposed Project's potential impacts to yield cumulatively significant impacts. As noted above, many of the proposed renewable energy projects may never be developed, and each project that advances into the permitting phase, will be required to more fully study cumulative impacts based on better and more detailed information. In addition, in this EIS, general assumptions can be made based on impacts that normally occur with any large scale industrial project.

During construction some impacts would be temporary in nature, such as increases in air pollution and dust, construction noise, and a disruption in local traffic patterns due to an increased amount of labor. Potential permanent impacts would be loss of habitat for local wildlife and plant species, possible loss of cultural or historical resources, and use or disturbance of water resources. Therefore, additional project-specific impacts might result.

During operations, permanent impacts might include the loss of habitat for wildlife, possibly increased air emissions depending on the type of technology being used, alteration of visual and aesthetic characteristics, increase use of water resources, increases in local employment, and other project-specific impacts.

Impacts can and would be required to be mitigated using site-specific BMPs. Permits required for construction and operation will include stipulations that require the operator/owner to utilize BMPs to establish and maintain compliance with the permits. It is important to note that each of the cumulative proposed projects on federal land will undergo its own NEPA review process, and will be required to comply with applicable regulatory requirements and to mitigate impacts that are identified in the review process.



APPLICANT	APPLIC. REC.	SERIAL NO.	ACREAGE	MW	PLANNED TECHNOLOGY
ABENGOA SOLAR INC	12/12/2008	NVN 086571	5,280.00	250	PHOTOVOLTAIC
AMARGOSA FLATS ENERGY LLC	3/12/2008	NVN 084704	7,040.00	600	COMPACT LINEAR FRESNAL REFLECTOR
COGENTRIX SOLAR SERVICES LLC	2/14/2007	NVN 083150	13,440.00	1,000	CSP (SOLAR THERMAL)
COGENTRIX SOLAR SERVICES LLC	3/5/2007	NVN 083220	12,800.00	1,000	CSP (SOLAR THERMAL)
COGENTRIX SOLAR SERVICES LLC	3/5/2007	NVN 083221	22,400.00	1,000	CSP (SOLAR THERMAL)
EWINDFARM INC	5/15/2008	NVN 085201	11,238.45	500	CSP (SOLAR THERMAL)
EWINDFARM INC	12/16/2009	NVN 088156	50,470.00	8,000	CSP (SOLAR THERMAL)
NYE COUNTY SOLAR I, LLC	9/29/2008	NVN 086217	14,260.00	300	PARABOLIC TROUGH
IBERDROLA DBA PACIFIC SOLAR INVESTMENTS INC	12/7/2007	NVN 084465	7,500.00	500	PARABOLIC TROUGH
IBERDROLA DBA PACIFIC SOLAR INVESTMENTS INC	12/7/2007	NVN 084466	7,700.00	500	PARABOLIC TROUGH
ALTA GAS RENEWABLE ENERGY / RHYOLITE WIND ENERGY PARK	8/30/2007	NVN 084067	7,360.00		WIND ENERGY

Amargosa Farm Road Solar Energy Project (NVN-84359)

Cumulative Impacts Figure 4-12

LEGEND

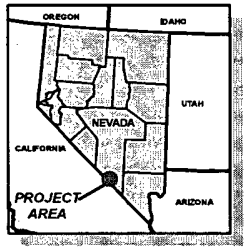
- Project Area
- Science and Technology Park
- Proposed Landfill
- Proposed Nevada Science Museum
- Proposed School
- West-wide Energy Corridor (Sec 386)
- Pending Wind
- Pending Solar
- BLM Solar Study Area
- Conceptual Yucca Mtn Project Gateway Area
- Proposed 500kV Transmission Line

Surface Management

- Bureau of Land Management
- Department of Defense
- Department of Energy
- National Park Service
- US Fish and Wildlife Service
- US Forest Service
- Private

General Reference Features

- Existing Transmission Line (<230kV)
- Existing Substation
- State Boundary
- US Highway
- State Highway



Source: Cases, WWEC, Land Ownership - BLM, 2009; Ash Meadows - USFWS, 2005; Imagery - ESRI, 2009; Wells - Nevada State Engineer, 2008; Transmission Lines, Substations - Platts, 2009

September 2010

0 4 8 Miles

4.17.5.1 Air Quality

Proposed Action

Construction of the reasonably, foreseeable projects within the Amargosa Valley airshed would generate similar types of emissions and could contribute individually and cumulatively to impacts to local and regional air quality. During construction of the proposed Project, mitigation measures will be in effect to control and minimize equipment and fugitive dust emissions. However, as cited in Section 4.1, construction activities would generate short-term emissions of CO, NO_x, VOCs, SO_2, PM_{10} and $PM_{2.5}$. Since construction impacts on air quality would be localized and short-term, only projects less than 5 miles from the proposed Project are considered that could, when added to the Proposed Action, contribute to cumulative impacts.

There are four solar development right-of-way applications within 1 mile of the Project site. These include the proposed Lathrop Wells Solar Project being developed by Abengoa Solar, Inc., the Amargosa North Solar Project being developed by Pacific Solar Investment, Inc., and two applications filed by Cogentrix for yet to be named solar facilities. As of August 2010, the Lathrop Wells Solar Project and Amargosa North Solar Project have begun their permitting process, including commencement of the federal NEPA process.

The Lathrop Wells Solar project is a proposed 250 MW parabolic trough, dry-cooled solar power plant, with an option to add an additional 250 MW dry-cooled unit and 20 MW of photovoltaic solar panels. The project site is located southwest of the intersection of US 95 and NV 373, approximately 1 mile northwest of the proposed Project. Abengoa Solar, Inc., filed a right-of-way application with the Pahrump Field Office for 5,336 acres of BLM managed land. The actual acreage required for the project footprint is unknown.

The Amargosa North Solar project is a proposed multi-phase photovoltaic solar project near the Big Dune Recreation Area, approximately 2.5 miles northwest of the Project site. The first phase is proposed as a 50 MW project, with additional phases to generate up to 150 MW of electricity. The developer, Pacific Solar Investments, Inc., filed a right-of-way application requesting 7,500 acres. The actual acreage required for the final project footprint is unknown.

Since limited information is available for these two projects, the amount of construction and operation emissions that may be attributed from each project is unknown. However, given the acreage associated with each project, and agency requirements to mitigate fugitive dust and equipment emissions during construction, impacts from construction would be similar to the Proposed Action. Each of the projects will be required to undergo a separate environmental review process and address its own emissions and impacts. Cumulative impact potential depends if these projects were to be constructed on overlapping schedules so that peak emissions and impacts coincide. Given that the proposed Project is scheduled to begin construction in early 2011, and the Lathrop Wells Solar Project and Amargosa North Solar Project recently began their permitting process, it is unlikely that these project will have cumulative air quality impacts with the proposed Project.

During operation, as cited in Section 4.1, the proposed Project is predicted to have minor, mitigated impacts for all criteria pollutants. Due to the large geographic area these projects occupy and the minimal emissions expected from other operating renewable energy facility, each of these projects is expected to have minor impacts individually and cumulatively with the proposed Project during operations. Virtually all of the cumulative projects listed in Table 4-43 are renewable energy facilities and thus would displace electricity generation that otherwise likely would occur with higher-polluting fossil fuels.

Wet-Cooled Alternative

Implementation of the wet-cooled alternative would have similar cumulative construction impacts as the Proposed Action (dry-cooled alternative). During operations, air quality impacts are likely to be similar to the Proposed Action, with the difference being an increase in additional PM_{10} and $PM_{2.5}$ emissions from the cooling towers associated with the wet-cooled facility. Since limited data is available for the Lathrop Wells Solar Project and Amargosa North Solar Project, the amount of increased PM_{10} and $PM_{2.5}$ emissions in the cumulative impact area cannot be calculated. However, given that each facility must comply with NDEP regulations governing air quality protection, it is unlikely the concurrent operation of all three facilities would result in the exceedance of federal and state air quality regulations.

4.17.5.2 Geological & Mineral Resources

Impacts to geological and mineral resources are generally localized and do not result in regionally cumulative impacts. Geological and mineral resources vary according to the geological formations that they occur within. Geological formations may also vary over short distances, effectively limiting the geographic range of the impacts to geological and mineral resources. Incremental impacts to area geology and mineral resources resulting from the construction, operation, and maintenance of the proposed Project, alone or together with other present and reasonably foreseeable future projects will not have cumulative impacts.

4.17.5.3 Soil Resources

Proposed Action

The development of more than 100,000 acres of proposed renewable energy projects would cumulatively impact soil resources in Amargosa Valley. The development of these projects would reduce the amount of soils available to plant, animal, and human communities in Amargosa Valley. Future construction projects will be required to develop and comply with site-specific soil protection measures as required by their NPDES permit. Projects on federally managed land will be required to undergo a separate environmental review process and address project-specific impacts on soil resources.

In consideration of the two pending solar projects currently in the permitting phase (Lathrop Wells Solar project and Amargosa North Solar project), up to 10,000 acres of desert lands would have 100 percent clearance of vegetation for construction of the proposed Project and Lathrop

Wells Solar project, and up to 7,000 acres could be partially disturbed from the construction of the Amargosa North Solar project.

The removal or disturbance of vegetation and soil crusts would expose soil and increase the potential for wind- and water-driven erosion. Appropriate mitigation measures to minimize soil erosion and loss would be mandated by the BLM as part of their right-of-way grants.

Wet-Cooled Alternative

Implementation of the wet-cooled alternative would have similar cumulative construction and operational impacts as the Proposed Action (dry-cooled alternative).

4.17.5.4 Water Resources

Proposed Action

The cumulative effects area for water resources is the Amargosa Desert Hydrographic Basin. Under the Proposed Action, during the 39-month construction period, up to 600 acre-feet of groundwater will be used annually for construction water needs. During operations, up to 400 acre-feet will be used annual for Project operations and maintenance.

The majority of reasonably foreseeable future projects in the Amargosa Desert Hydrographic Basin are other solar energy developments on federal lands. Projects that advance into the permitting phase would be required to undergo a separate environmental review process and address project-specific impacts on water resources. For any project needing a stable water supply within the area subject to Order 1197, the developer would need to either lease or purchase water currently being pumped under an existing certified water right. Since the water user can only pump up to the authorized duty of the water right, there would be no net increase in groundwater pumping within the basin. However, since most wells in the Amargosa Valley are not metered, it is difficult to quantify the amount of water that may actually be pumped if all interrelated projects were to be approved. An indirect impact of conversion of agricultural water rights to industrial water rights would be a reduction of return flow (recharge) from irrigation.

As of September 2010, only two proposed solar projects, the Lathrop Wells Solar project and Amargosa North Solar project, have reached the federal permitting stage. Information about each project's water needs is limited. However, based on industry standards, it is anticipated the Lathrop Wells Solar project, a parabolic trough dry-cooled solar facility, will require 300 to 500 afy for construction and operations. The Amargosa North Solar project, a multi-phase photovoltaic project, will require substantially less water during construction and operation. Because a photovoltaic project does not require extensive land clearing during construction, and water is only needed for mirror washing and dust control during operations, it is anticipated that 5 to 10 afy will be required for this project, depending on the size of the final project. At this time, it is unknown where each developer will acquire their project water.

The water used for the construction and operation of the proposed Project, when added to the water requirements for the Lathrop Wells Solar project and Amargosa North Solar project, would

result in a conversion of over a 1,000 afy of existing water rights from their current permitted use (most likely agricultural, as these are the most senior rights in the basin), to industrial use.

To avoid individually and cumulatively significant impacts to water resources, it is likely the NPS, USFWS, and BLM would require other solar developers agree to water mitigation measures like those required for the proposed Project. This may result in additional groundwater being retired or held in abeyance until it could be proven that its use would not impact sensitive resources at Ash Meadows NWR or Devils Hole. No net increase (and a possible decrease) in water usage resulting from these restrictions would avoid significantly cumulative impacts to water resources and potential impacts to sensitive species. However, since water must be obtained from an existing water right holder, and there are limited senior water rights within the basin, implementation of such measures would result in less water being available for other uses, which might constrain other types of economic development in the regional area.

The Fortymile Wash drainage traverses the Project site. Two other solar energy projects are proposed immediately north of the Project site: Cogentrix Solar Services, LLC (NVN-083150), and the Lathrop Wells Solar project. Under the Proposed Action, the Proponent intends to protect the property from off-site flows by means of a continuous channel around the northern and western perimeter of the Project site. The channel will be designed to effectively intercept the 100-year storm event off-site runoff and convey the concentrated flow to the southwest corner of the property. The Lathrop Wells Solar project is in the preliminary design stage. Information about the proponet's plans for stormwater control or design features are unknown at this time. Since this project is also located within the Fortymile Wash drainage, upstream of the proposed Project, future stormwater design measures would need to be coordinated with downstream development, including the proposed Cogentrix solar development, and the proposed Project. They will also be required to consult with the USACE to determine how their project layout and design will impact any jurisdictional waters contained within and downstream of their site.

Hazardous material spills can occur during project construction and operation. All foreseeable projects, including the proposed Project, are required by law to implement a site-specific SWPPP and SPCC Plan to address how mitigation measure will be adopted and enforced to minimize or avoid these events. Given that depth to groundwater in the Project area is more than 135 feet below ground surface, it is highly unlikely that spills would reach and contaminate groundwater in the area.

Wet-Cooled Alternative

Construction of the wet-cooled alternative, would have similar cumulative construction impacts on water resources as the Proposed Action (dry-cooled alternative). The largest difference between the two alternatives is the amount of operational water to be obtained from existing water right holders, and the conversion of these waters from agriculture use, or their current use, to industrial. In addition, the amount of water the NPS, USFWS, and BLM will require for water mitigation under the wet-cooled alternative is likely to be substantial, which when added to other reasonably foreseeable project water needs, would result in less water being available for agriculture, industrial, or commercial use in the Amargosa Valley. However, reducing the amount of water pumped from the basin may result in less water-related impacts to sensitive species Ash Meadows NWR and water levels at Devils Hole.

4.17.5.5 Noise

Cumulative noise impacts from the construction and operation of solar energy facilities are generally localized. The mechanical equipment associated with each of the cumulative projects is unlikely to result in combined noise impacts to a given known sensitive receptor due to the distance between each project. However, due to the increase in traffic volumes along highways and local roads from the construction and operations of multiple solar projects, an increase to the community ambient noise levels may occur.

Due to the remoteness of the general area and the size of the individual projects, instances where there would be cumulative noise impacts occurring at any given sensitive receptor location during construction activities would be infrequent and would only occur if multiple projects are constructed at the same time or when the construction activities occur along the adjacent project boundaries where known sensitive receptors are located. Given that the proposed Project is scheduled to begin construction in early 2011, and the Lathrop Wells Solar project and Amargosa North Solar project recently began their permitting process, it is unlikely that these projects would have cumulative noise impacts with the proposed Project.

4.17.5.6 Vegetation

Proposed Action

The cumulative effects area for vegetation resources is the Amargosa Desert Hydrographic Basin. Any development that results in the clearing and grading of existing desert lands would have cumulative effects within the Basin. In consideration of the two pending solar projects currently in the permitting phase (Lathrop Wells Solar project and Amargosa North Solar project), if all three projects were to be approved and constructed, up to 10,000 acres of desert lands would 100 percent clearance of vegetation for construction of the proposed Project and Lathrop Wells Solar project, and up to 7,000 acres could be partially disturbed from the construction of the Amargosa North Solar project.

Other cumulative impacts may result if non-native invasive species are allowed to spread or be introduced in an area, eventually replacing naturally occurring communities. Native plants generally have a slow recovery rate, and generally cannot recover from severe disturbance.

To avoid individually and cumulatively significant impacts to sensitive resources at Ash Meadows NWR and Devils Hole, it is likely the NPS, USFWS, and BLM would require future solar developers agree to water mitigation measures like those required for the proposed Project. No net increase (and a possible decrease) in water usage resulting from these restrictions would avoid significantly cumulative impacts to vegetation resources.

Each project on federally managed land will be required to undergo a separate environmental review process and address project-specific impacts on vegetation resources.

Wet-Cooled Alternative

Construction of the wet-cooled alternative would have similar cumulative construction impacts on vegetation as the Proposed Action (dry-cooled alternative). The largest difference between the two alternatives is the amount of operational water to be obtained from existing water right holders and the conversion of these waters from agriculture use, or their current use, to industrial. In addition, the amount of water the NPS, USFWS, and BLM will require for water mitigation under the wet-cooled alterative is likely to be substantial, which when added to other reasonably foreseeable project water needs, would result in less water being available for agriculture, industrial, or commercial use in the Amargosa Valley. However, reducing the amount of water pumped from the basin may result in less water-related impacts to sensitive plant species at Ash Meadows NWR and water levels at Devils Hole.

4.17.5.7 Wildlife

Proposed Action

The development of over 100,000 acres of proposed renewable energy projects would cumulatively impact wildlife and wildlife habitat occupying Mojave desert scrub. The development of these projects would reduce the available habitat for wildlife (diverse group of reptiles, mammals, and birds), federally listed species (e.g., Mojave Desert Tortoise), and other special status species (e.g., Le Conte's Thrasher, Burrowing Owl). Cumulative impacts would contribute to the loss, fragmentation, and degradation of Mojave desert scrub, which would result in impacts to habitat connectivity, genetic integrity of wildlife populations, wildlife movement corridors, fragmentation of species populations, significant alteration of natural riparian habitat and function, and loss of occupied habitat for a variety of animals. Cumulative impacts, if not mitigated, could also encourage the proliferation of non-native invasive species, thereby eliminating or degrading natural plant communities upon which wildlife depend.

The Desert Tortoise inhabits the area in extremely low densities. The 2009 surveys of the Project area detected four old burrows and no additional signs of recent inhabitation by tortoises. The quality of the habitat in the Amargosa Valley has been found to be of low quality due to lack of annuals and other suitable forage for Desert Tortoises. According to NNHP data (2009), there are 10 known locations of Desert Tortoises found within the areas of the proposed projects. The majority of the Desert Tortoise locations in the vicinity are to the north of US 95 or south and east of Ash Meadows NWR.

The interrelated projects and activities with potential effects on groundwater resources include the possible, but unlikely construction and operation of all renewable energy projects, development of other projects (e.g., transmission upgrades), and continued groundwater pumping for agricultural, industrial, and domestic use in the Amargosa Valley. Cumulative indirect effects from groundwater pumping in the regional flow system may result in decline in local and regional groundwater levels, including the Ash Meadows area, and the special status wildlife species which occur there, and flows at downgradient locations.

Based on the location of the proposed Project and the results of the biological resources study that was conducted, the potential for cumulative impacts to wildlife as a result of the construction

of this Project is moderate. The elimination of vegetation (described above) or habitat directly affects local wildlife ecology and would contribute to changing trends in wildlife populations, movement and breeding of wildlife, and alter the interrelationships with other species occupying different ecosystems. Wildlife species occupying small, isolated patches of habitat – a possible result of multiple renewable energy or other projects being built in the region – are more susceptible to disturbance than species that are more widely distributed over the landscape in concentrated and well-connected habitat. Species' susceptibility to disturbance and other adverse effects may increase due to changes from the global climate change. Because the region consists mostly of federal land managed by the BLM, future projects will be required to identify wildlife, including federally protected species and other sensitive species that would be affected by those projects and to avoid or mitigate those effects through sensible project placement, project redesign, acquisition of mitigation lands, and other measures. Any potential adverse effects to wildlife or wildlife habitat that are identified will be avoided or, where avoidance is not possible, mitigated. BLM's Solar Programmatic EIS also will evaluate and address potential cumulative impacts to wildlife and other resources from solar energy development on BLM-managed lands, including those in the region.

Wet-Cooled Alternative

Construction of the wet-cooled alternative, would have similar cumulative construction impacts on wildlife as the Proposed Action (dry-cooled alternative). The largest difference between the two alternatives is the amount of operational water to be obtained from existing water right holders, and the conversion of these waters from agriculture use, or their current use, to industrial. In addition, the amount of water the NPS, USFWS, and BLM will require for water mitigation under the wet-cooled alterative is likely to be substantial, which when added to other reasonably foreseeable project water needs, would result in less water being available for agriculture, industrial, or commercial use in the Amargosa Valley. However, reducing the amount of water pumped from the basin may result in less water-related impacts to sensitive wildlife species at Ash Meadows NWR and water levels at Devils Hole.

4.17.5.8 Cultural Resources

Over time, cultural resources are subject to slow degradation as cultures change, and archaeological and historical sites weather and erode. Prior development of various types of projects has degraded and destroyed cultural resources as well. Indirect impacts on cultural resources can result from degrading the setting of a historic property and incidental damage to cultural sites as a result of increased public access to previously inaccessible areas.

Based on the location of the proposed Project and the results of the cultural resource study that was conducted, the potential for cumulative impacts to archaeological and historic sites as a result of the construction of this Project is considered low. The Project is located in an area with low site density which is currently accessible by the public and only one prehistoric site has been deemed significant. A potential increase in personnel living in the Amargosa Valley, as a result of the proposed Project may have an effect on currently undiscovered historic properties in nearby areas if those personnel engaged in recreational pursuits in the region. Because the region consists mostly of federal land managed by the BLM, any future projects will be required to

identify any historic properties that would be affected, and any adverse effects to cultural resources identified would be mitigated.

4.17.5.9 Paleontological Resources

Impacts to paleontological resources are generally localized and do not result in regionally cumulative impacts. Paleontological resources vary according to the geological formations that contain them. Geological formations may also vary over short distances, effectively limiting the geographic range of impacts to paleontological resources.

The impacts of the Proposed Action to paleontological resources will be localized within the Project area. The suggested mitigation measures will ensure that the potential for adverse impacts to paleontological resources are minor. There is, however, the potential for future projects in the vicinity to disturb areas that may contain known or unknown paleontological resources. Future projects with potentially significant impacts to paleontological resources would be required to comply with federal and state regulations and ordinances protecting paleontological resources through implementation of similar mitigation measures as proposed here. Therefore, the potential construction impacts of the Proposed Action in combination with other projects in the area would not contribute to a cumulatively significant impact to paleontological resources.

4.17.5.10 Socioeconomic Resources

Proposed Action

There is the potential for substantial renewable energy development not only in the Amargosa Valley, but throughout the desert Southwest. If all of these projects were to be built, they would have a significant cumulative impact on socioeconomic resources. Most of these projects are located in sparsely populated areas which if approved and built, would contribute to changes in the rural character of the area. These changes would result in both beneficial (e.g. increased employment opportunities, and direct and indirect business and tax revenues) and potentially adverse effects (e.g. removal of large tracts of desert ecosystems, visual impacts, increased traffic and noise, and increased burden on public services such as law enforcement, firefighting, and other emergency services providers).

For this analysis, the geographic extent of cumulative impacts related to socioeconomics includes the Amargosa Valley, and larger cities within 2 hours of the Project area, including the Town of Pahrump, Las Vegas, and surrounding communities. This geographic extent is appropriate because local jurisdictions or districts provide socioeconomic factors, such as public services, and the labor force and housing market potentially impacted is expected to come primarily from within these areas.

The cumulative influx in laborers commuting from surrounding communities to the Amargosa Valley would increase regional traffic loads along US 95, if commuting from the north Las Vegas area, and along US 160 if commuting from the southern end of the Las Vegas valley and

Pahrump. As it is expected that many construction workers would opt to commute long distances to their work sites, temporary adverse impacts would result from the construction of multiple, large projects in the area. Depending on the level of vehicle traffic along these roadways, the potential for increased traffic violations and accidents may increase; thereby taxing the local public safety and emergency responders current workload. If the proposed Project and PSI's proposed Amargosa North and South projects were to be constructed during the same period, there would be significant impacts to Valley View Boulevard and portions of US 95 in that area. As part of the Development Agreement between Nye County and the Proponent, the Proponent is required to conduct a Master Traffic Impact Analysis prior to commencement of construction. The traffic study must be submitted and approved by Nye County. The Proponent will improve Valley View Boulevard in accordance with the approved Master Traffic Impact Analysis.

Implementation of the proposed renewable projects would create job stimulus within the local area that could increase population in the Amargosa Valley and other Nye County communities, including Beatty and Pahrump. This influx of workers would mean an increase in economic activity from workers spending in local businesses, and the projects themselves for construction materials and supplies. The increase in commercial activity to meet the demand of a new commuter population would potentially have indirect positive (economic) and adverse (increased traffic) impacts to the Project area.

In addition, the long-term payment of taxes and fees and distribution of payroll dollars is expected to have a significant cumulative benefit to both Nye and Clark counties by increasing the amount of public funds available to the counties for community projects. The cumulative benefits would be increased when combined with the revenues accrued as a result of current and future reasonably foreseeable projects.

Affected groups such as immediate neighbors, health and safety providers, outdoor recreationists, environmental groups and stewards, and federal, state, and local agencies would have varying attitudes regarding the development of reasonably, foreseeable future projects in the cumulative effects area. The removal of large tracts of desert ecosystems for the development of energy development projects (e.g. solar, wind, and associated transmission), would be viewed negatively by those individuals and entities concerned about the loss or fragmentation of desert habitat. However, commercial and industrial developers, along with those individuals and entities seeking economic benefits of these projects may have differing views regarding the tradeoffs between economic development and land and resource preservation.

Federal, state, and local agencies with jurisdiction over lands and resources within the area will face increased challenges in meeting federal and state mandates to increase renewable energy production, while addressing differing views concerning the development of federal lands and use of sensitive resources such as water and undisturbed desert lands, and impacts to viewsheds, recreational opportunities, and increased traffic, noise, and growth inducing impacts to local communities. Cumulative impacts to land use, recreation and transportation and access is described in Section 4.17.5.12. Cumulative impacts to visual resources is described in Section 4.17.5.13.

Concurrent construction and operation of other reasonably foreseeable future projects, such as the Lathrop Wells and Big Dunes North and South Solar Projects would have the potential to

place more demands on the local law enforcement, firefighting and other emergency services providers. The Proponent has entered into a Development Agreement with Nye County in which it has agreed to the following to help mitigate any increase in demand on local emergency services (Nye County 2010):

- Annually provide emergency and fire protection training for up to four individuals identified by Nye County, with priority given to individuals who serve in the Amargosa Valley Volunteer Fire Department. This training will be equivalent to the training provided to the Proponent's on-site personnel. Training will be compliant with the guidelines of the National Fire Protection Agency standards as it relates to structures, materials, and hazards present on-site and wildlands adjacent to the proposed Project site.
- Annually pay $20,000 to the county for use in providing police services in the Town of Amargosa.
- Provide a water supply for the County's use in responding to fires within the Town of Amargosa.
- Annually pay $20,000 for the County's use in providing staff and equipment for the Town of Amargosa medical clinic.

Similar to the proposed Project, it is assumed that other solar developers would incorporate project-specific fire protection plans into their project design and operations. All fire protection plans must consider NFPA and OSHA standards. Also, it is very likely that Nye County will request a similar Development Agreement be agreed to between the County and the Developer to help offset increase demands on local public services.

As described in the water mitigation measures agreed to by the Proponent, NPS, USFWS, and the the BLM, if it is determined that the use of groundwater for construction and operation of the proposed Project would have discountable or negligible impacts to sensitive resources at Ash Meadows NWR and Devils Hole, the water rights held in abeyance may be used by Nye County for economic development, pending approval by the Nevada State Engineer.

Wet-Cooled Alternative

With the exception of the amount of water that may be required to be retired or held in abeyance as water mitigation, implementation of the wet-cooled alternative would have similar cumulative construction and operational impacts on socioeconomic resources as the Proposed Action (dry-cooled alternative).

4.17.5.11 Environmental Justice

As discussed in Chapter 3.10, there are no EJ communities within the study area for the proposed Project. Therefore, cumulative impacts to EJ are not analyzed for the Proposed Action because the construction and operation of the proposed Project would not have a disproportionate effect on low-income or minority populations. There are no special issues, such as housing, transportation, access, or resource use in the Project area that would affect the EJ population disproportionately.

4.17.5.12 Land Use, Recreation, Transportation, and Access

Proposed Action

Over time, land use, transportation, access and recreation resources are impacted as land changes ownership, plans and facilities are developed, and demands for infrastructure increase or decrease. Prior activities including agriculture and mining in the Amargosa Valley have decreased available land, while simultaneously increasing access and transportation. Pending leases and rights-of-way on BLM land continuously impact land use in the area.

The potential for cumulative land use, recreation, and transportation impacts exists where there are multiple projects proposed in an area that could impact similar resources. Projects with large land use conversions similar to the proposed Project would collectively result in an adverse impact to the Valley's land use, recreation, and transportation resources by virtue of the nature of the acreage they occupy and the increase in employee traffic.

Overall, some short-term and long-term, adverse and non-adverse cumulative impacts to transportation and recreation could occur in Amargosa Valley as a result of constructing numerous energy projects. Given that the proposed Project is scheduled to begin construction in early 2011, and only other projects currently in the federal permitting process (Lathrop Wells Solar project and Amargosa North Solar project) recently began their permitting process, it is unlikely that these projects will have cumulative construction-related traffic impacts with the proposed Project.

Based on the available data on pending renewable energy applications with the BLM, more than 100,000 acres of primarily federal land use would be converted to industrial use if all of those projects were built. The most important adverse impact related to this development would be the loss of access to land due to BLM disposal. By leasing/selling to developers, the loss of available lands for other uses (i.e., water and mineral resource development) would result.

Additive impacts on land use would also result from numerous existing and proposed industrial developments within the Amargosa Valley area, including agriculture, mining, solar power plants, and transmission lines. Increased energy development would drive the demand for the use of new and existing right-of-way corridors for transmission lines, pipelines, distribution lines, and roads to support the construction of these planned facilities.

An increase in various energy developments would potentially modify the character of the Amargosa Valley area. As development occurs, the very rural environment would become increasingly industrial. Large industrial developments that require many employees would spur other commercial and residential growth within the region, resulting in increased need for improved transportation corridors and other infrastructure.

Although no direct impacts would occur in the Special Management Areas in the area, if populations increase as a result of industrial development, the use of designated and dispersed recreation areas within the Amargosa Valley area could also increase. Facilities would be stressed by the increased use, but could simultaneously benefit from the increased fee revenue.

The quality of the recreational setting could be reduced due to the cumulative increase in development (through loss of wilderness aesthetic, etc. [see Visual Impacts]).

The construction and operation of Abengoa's Lathrop Wells Solar Project and PSI's Big Dunes North and South Solar Project, in addition to the proposed Project, may potentially remove up to 24,000 acres of federal lands from multiple uses, including recreational opportunities such OHV use and other dispersed recreational uses such as hiking and wildlife viewing on lands converted to industrial uses. If construction of the PSI Big Dunes North and South Solar Project were to occur concurrently with the proposed Project, construction activities may temporarily restrict access to the Big Dune Recreation Area along Valley View Road. As stipulated in the Nye County Development Agreement (Appendix F), prior to commencement of construction, the Proponent is required to submit a Master Traffic Impact Analysis for review and approval by the County. The analysis will assess the construction and operations traffic and the impacts, if any, of the transportation of employees and equipment to and from the Project site. If the study determines that improvements are required, the Proponent will provide improvements required in the approved Master Traffic Impact Analysis in order to mitigate the traffic impacts of the Project.

Wet-Cooled Alternative

With the exception of the amount of water that may be required to be retired or held in abeyance as water mitigation, and the fallowing of lands tied to the water right, implementation of the wet-cooled alternative would have similar cumulative construction and operational impacts on socioeconomic resources as the Proposed Action (dry-cooled alternative).

4.17.5.13 Visual Resources

Proposed Action

The possible but unlikely development of over 100,000 acres of proposed solar projects would result in cumulative impacts to the viewsheds from public roadways, recreation areas, and residential areas. Viewsheds of the Project vicinity are extensive given the topography of the Amargosa Valley, lack of vegetative screening, and dispersed nature of sensitive viewers.

Potential cumulative visual impacts would result from the construction, operation, and maintenance of the proposed Project in the context of current and proposed projects within the Amargosa Valley. The majority of proposed projects are other solar generation projects and would have similar visual effects when compared to the proposed Project. Current and future projects would incrementally modify the setting in a similar manner, as compared to the proposed Project, which would result in an industrial landscape character. Nighttime lighting for future solar projects would be similar in nature to the proposed Project lighting, and would likewise incrementally modify the night sky This change in landscape character in conjunction with potential viewer impacts would result in adverse cumulative impacts.

The proposed Project, along with the past, present, and reasonably foreseeable projects, could substantially alter the visual character of the areas within the Project vicinity. Many of the

proposed projects would have the potential to create new visual impacts within the viewsheds that could be affected by the proposed Project from public roadways, recreation areas, and residential areas. The increase in energy development would result in increased demand for the existing right-of-way as well as new corridors for transmission lines, pipelines and distribution lines that would incrementally increase visual impacts to sensitive viewers (e.g., residences and travel routes) and scenic quality.

Adding to the possible industrial nature of Amargosa Valley would be any future stipulation by federal agencies requiring other renewable energy developers obtain and retire existing water rights to offset potential impacts to sensitive resources in the Ash Meadows NWR, Devils Hole, and other downgradient locations. The retirement of agricultural water rights would result in decreased agricultural production, the fallowing of agricultural fields, thereby creating areas devoid of vegetation.

Wet-Cooled Alternative

Implementation of the wet-cooled alternative would have similar cumulative construction and operational impacts on visual resources as the Proposed Action (dry-cooled alternative).

4.17.5.14 Human Health and Safety/Hazardous Materials

Proposed Action

Proper facility design and the development and implementation of safe material handling programs for each Project would reduce the potential for cumulative impacts from release of hazardous materials on the environment. Each reasonably, foreseeable, future project would be required to comply independently with hazardous materials regulations, depending on their specific circumstances (e.g., nature and quantities of hazardous materials stored and used). Many of the cumulative projects (including the proposed Project), are separated by miles from any of the other projects so there is minimal risk of an accident at one project affecting another project. Solar projects also use less hazardous materials than do fossil fuel-fired power plants. In short, Project construction and operation activities would not cause or contribute substantially to significant cumulative impacts with respect to hazardous materials handling from either a local or regional perspective.

Wet-Cooled Alternative

Implementation of the wet-cooled alternative would have similar cumulative construction and operational impacts as the Proposed Action (dry-cooled alternative).

CHAPTER 5 - CONSULTATION AND COORDINATION

This chapter describes the consultation and coordination activities the BLM has carried out with interested agencies, organizations, Tribes, and individuals while preparing the Final EIS. The NEPA (42 USC §§ 4321-4347) and the regulations that implement it (43 CFR Part 46; 40 CFR §§ 1500-1508) require the public's involvement in the decision-making process as well as allowing for full environmental disclosure. Guidance for implementing public involvement also is outlined in Title 43 CFR, Part 1610.2.

During the early phases of the scoping process, the BLM determined that an EIS would be required to comply with NEPA prior to taking action on Solar Millennium's right-of-way application. An EIS is the most detailed and complex of NEPA documents, and it includes requirements for significant public coordination and involvement throughout its preparation and review. NEPA and CEQ require the BLM to identify and disclose any potential environmental impacts associated with the Proposed Action so that the BLM can make an informed decision when making its final decision.

5.1 PUBLIC INVOLVEMENT PROCESS

Public involvement in the EIS process includes the steps necessary to identify and address public concerns and needs. The public involvement process assists agencies in: (1) broadening the information base for decision-making, (2) informing the public about Proposed Actions, alternatives, and potential impacts that could result from implementation of the Proposed Action or alternatives, and (3) ensuring that public needs are understood by the agencies. Public participation in the EIS process is required by the NEPA at four specific points: (1) issue scoping, (2) review of the Draft EIS, (3) review of the Final EIS, and (4) receipt of the ROD.

5.1.1 Scoping

Public scoping is an integral part of the NEPA planning process. It provides "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a Proposed Action" (40 CFR § 1501.7). Public and agency input is solicited in order to identify the range, or scope, of issues to be addressed during the environmental analysis and in the EIS. Initiation of the EIS process and the public scoping meetings for the proposed Project were announced through the Federal Register, BLM press releases, paid advertisements in the media, and postings on the BLM Project website. These activities are described below.

5.1.2 Federal Register Notice of Intent

The BLM Federal Register NOI, published on July 13, 2009 (Volume 74, Number 132, Page 33.458), marked the beginning of the public scoping period for the Project EIS. The scoping period, required to be a minimum of 30 days, was announced as ending on August 12, 2009. Public scoping meetings were not conducted within this time period; therefore, a second notice was published in the Federal Register on September 17, 2009 (Volume 74, Number 179,

Page 47820), reopening public scoping. This reopened scoping period was announced as ending on October 19, 2009. Four scoping meetings were held from August 17 through August 24, 2009, and one information meeting was held on September 22, 2009 (see below).

5.1.3 Media Notices

The BLM prepared a media release to introduce the proposed Project, announce the initial scoping meetings, and invite the public to provide input. The news release was issued on August 12, 2009 to local and regional newspapers, congressional offices, television stations, and radio stations. A second news release was issued on September 3, 2009, announcing the reopening of the scoping period.

In addition, paid advertisements were published in the following local newspapers:

- *Las Vegas Review-Journal* – legal ad published on July 31, 2009
- *Pahrump Valley Times* – display ads published on July 31, 2009 and September 18, 2009

5.1.4 Direct Mailings

A public scoping notice was prepared and mailed to inform the public about the scoping process for the preparation of the EIS and the scheduled scoping meetings. The public was invited to participate in the scoping process and to share any concerns or comments, submit information, and identify issues to be addressed during the EIS process.

The notice was mailed to federal, state, and local agencies; elected officials; Native American tribes; and special interest groups and organizations, during the week of August 3, 2009. The distribution list was compiled from a list of individuals, organizations, and agencies who had expressed interest in other BLM Pahrump Field Office projects. In addition, the notice was mailed to postal customers in the Amargosa Valley (zip code 89020).

A second notice was mailed to individuals and agencies/organizations on the mailing list and the members of the public who signed in at public scoping meetings held in August 2009 for the proposed Project. The second notice was to inform the public of the public information meeting to be held in Beatty on September 22, 2009. This meeting was an opportunity for the public to submit comments during the reopened scoping period.

5.1.5 Project Website

The BLM Southern Nevada District Office is hosting a website to inform the general public about the Proposed Action. Information on the website includes public meeting announcements, a Project description, and the EIS planning process. The website is available at: http://www.blm.gov/nv/st/en/fo/lvfo.html.

5.1.6 Public Scoping Meetings

The BLM held four public scoping meetings to identify issues and concerns regarding the Proposed Action. These scoping meetings provided an opportunity for the public to learn about the Proposed Action and to provide comments. Meeting locations, dates, and times are provided in Table 5-1. In addition to the public scoping meetings, one public information meeting was held during the reopened scoping period.

Table 5-1 Public Scoping Meetings

Location	Date	Time	Attendance*
Beatty, Nevada	August 17, 2009	6:00 – 8:00 p.m.	34
Amargosa Valley, Nevada	August 18, 2009	6:00 – 8:00 p.m.	112
Pahrump, Nevada	August 21, 2009	6:00 – 8:00 p.m.	26
Las Vegas, Nevada	August 24, 2009	6:00 – 8:00 p.m.	60
Beatty, Nevada**	September 22, 2009	6:00 – 8:00 p.m.	66
		Total	**298**

*These counts reflect only those attendees who elected to sign in at the door
**Public information meeting following reopened scoping period.

5.1.7 Comment Methods

During the public scoping period (August 13 through October 19, 2009), a total of 151 comment documents were received. A comment document is defined as a method of response recorded as part of a public scoping transcript, email, fax, letter, or comment form. Because some documents had more than one comment, the total number of comments received is greater than the number of respondents or individuals who submitted comments. Table 5-2 presents the method of submittal of all responses.

Table 5-2 Comment Method of Submittal

Method of Submittal	Number Received
Comment Form	17
Email	36
Letter or Fax	19
Oral Comments Submitted at the Scoping Meetings (transcribed from the court reporter transcript)	-
Beatty scoping meeting	6

Table 5-2 Comment Method of Submittal	
Method of Submittal	**Number Received**
Amargosa Valley scoping meeting	24
Pahrump scoping meeting	8
Las Vegas scoping meeting	22
Beatty information meeting	19
Total responses	**151**

5.2 SUBSTANTIVE ISSUES IDENTIFIED DURING SCOPING

Table 5-3 displays the relative interest of respondents who submitted comments on various topics. This breakdown does not show bias towards any issue; it simply indicates the level of interest on various issues. All issues are addressed equally in the EIS.

Table 5-3 Topics of Interest	
Comment Category	**Number Received**
NEPA and NEPA Process	101
Alternatives	87
Air Quality and Climate Change	59
Cultural Resources	8
Cumulative Impacts	39
EJ	4
Fish and Wildlife	45
Floodplains	20
Geology and Mineral Resources	3
Health and Safety	77
Invasive Species	4
Lands and Access	66
Migratory Birds	13
Native American Religious Concerns	5
Noise	7

Table 5-3 Topics of Interest	
Comment Category	**Number Received**
Recreation	5
Socioeconomic Resources	198
Soils	6
Special Management Areas	28
Threatened, Endangered, and Candidate Plant Species	18
Threatened, Endangered, and Candidate Wildlife Species	53
Transportation	48
Vegetation	37
Visual Resources	25
Waste (hazardous and solid)	40
Water Resources	164
Wetlands and Waters of the U.S.	15
Total	**1,175**

Table 5-4 summarizes the substantive issues and concerns derived from the scoping comments and indicate where each issue identified during scoping is addressed in the EIS. This summary is intended to reflect the comments received during the scoping phase equally and does not attempt to assign value to any input. Specific comments and context are not provided here, only issues represented in those comments that can be applied directly to preparation of the EIS. For example, some respondents provided their views on the value (negative or positive) of solar energy development; only the issue areas they raised in conjunction with their views are provided. Issue statements and questions to address the issues in the EIS can be found in the public scoping report. Copies of the individual comments received during the scoping period are available for review at the BLM Pahrump Field Office.

Table 5-4 Issues Raised During Scoping	
Issues	**Section(s) of the EIS Where Addressed**
NEPA Process	
The EIS should consider how NEPA goals will be incorporated into the BLM's decision and describe how the proposed Project would be consistent with other national policy considerations.	1.1 – Introduction 1.5 – Scope of Analysis
Requests that the proposed Project be put on hold until all permits and easements have been received and the proposed Project has been reviewed by other agencies (e.g., Nevada Engineers Office, FEMA).	1.7 – Agency Coordination
Alternatives	
A reasonable range of management alternatives meeting the purpose and need should include alternative sites, capacities, and technologies, and include those that may not be within the jurisdiction of the lead agency.	2.2 – Alternatives Description
The three different technologies should be analyzed in the EIS: dry-cooling, hybrid cooling, and wet-cooling	2.2 – Alternatives Description
The BLM should consider other locations for the proposed Project that would reduce potential use conflicts and meet the Project purpose and need, even if they are not located on public land.	2.2 – Alternatives Description
Consider use of different solar energy technology, including the use of hybrid or dry-cooled systems or replacing trough technology with photovoltaic.	2.2 – Alternatives Description
Air Quality	
Activities related to the construction and operation of the proposed Project has the potential to result in increased dust. Additionally, construction, operation, and mitigation of the solar generating facility could result in increased emissions.	4.1 – Air Quality
The EIS should identify the types of dust control to be used during construction and operation, and if water is to be used, the amount of water needed, and the source of the water.	4.1 – Air Quality
Air monitoring should be conducted before, during, and after facility construction and operation. Specific concerns were expressed regarding hazardous materials that may be present in airborne dust (e.g., uranium, radon, and other hazardous elements in surface soils).	4.1 – Air Quality 4.13 – Hazardous Materials and Solid Waste
The EIS should include a discussion of ambient air conditions, NAAQS, and criteria pollutant nonattainment areas in all areas considered for solar development, and that the analysis should specify (1) the emission sources by pollutant from mobile sources, stationary sources, and ground disturbance; (2) the timeframe for release of these emissions over the lifespan of the Project; (3) proposed mitigation measures to minimize these emissions.	4.1 – Air Quality

Table 5-4 Issues Raised During Scoping	
Issues	**Section(s) of the EIS Where Addressed**
The EIS should identify the need for an Equipment Emissions Mitigation Plan, to identify actions to reduce diesel particulate, CO, hydrocarbons, and NO_x associated with construction activities for equipment such as drilling equipment, generators, compressors, graders, bulldozers, and dump trucks.	4.1 – Air Quality 4.13 – Hazardous Materials and Solid Waste
Cultural Resources	
Ground disturbing activities resulting from construction and operation of a solar generating facility have the potential to discover/disturb cultural resources in the area, including the physical integrity of sacred sites. The EIS should evaluate potential impacts on archaeological, cultural, and historical resources in the vicinity of the Project, including Native American resources, burial sites and artifacts, and historical mining operations and related artifacts.	3.7 – Historic and Cultural Resources 4.7 – Historic and Cultural Resources
Cumulative Impacts	
A number of other solar generating power facilities are being considered in southern Nevada and may impact a variety of resource values and uses, including water supply, endangered species, visual resources, wildlife, and threatened and/or endangered species habitat.	4.17 – Cumulative Impacts
Environmental Justice	
EJ (minority and low income) populations may be affected by the construction and operation of the Project.	4.10 – Environmental Justice
Fish and Wildlife	
Concerns about wildlife habitat from depletion of water resources and impacts to wildlife from site development and facilities.	4.6 – Biological Resources
Concern that impacts may extend beyond the physical footprint of the Project area. Requests made that Project monitoring be conducted to evaluate Project impacts, and adoption of adaptive mitigation solutions be considered.	4.6 – Biological Resources
Construction and operation of the facility could result in impacts to wildlife in the area, including: • impacts as a result of an increase in shade, dust, and heat, and impacts to wildlife species • impacts as a result of exposure to contaminants in evaporation ponds and/or stormwater ponds if these water structures attract wildlife, particularly migratory waterfowl and bats	4.6 – Biological Resources
Geology, Mineral Resources, and Soils	
The Project may have impacts to soil resources, and may cause soil erosion.	4.3 – Soils

Table 5-4 Issues Raised During Scoping	
Issues	**Section(s) of the EIS Where Addressed**
Health and Safety	
Primary concerns were related to safety measures to be used during both construction and operation of the facility, and the proximity of the proposed Project to occupied residential areas (especially to residents living along Sandy Lane), and other built areas, including the Amargosa Elementary School and senior center.	4.9 – Socioeconomic Resources
Concerns regarding the potential for fire and explosions to occur at the site during operations.	4.9 – Socioeconomic Resources 4.13 – Hazardous Materials and Solid Waste
Lands and Realty	
Several right-of-way applications have been filed with the BLM for proposed solar generation facilities. One of the applications is for a proposed site immediately north of the Project and farther away from existing land uses.	2.2 – Alternatives Description
The EIS should describe the reasonably foreseeable future land use and associated impacts resulting from additional power supply in Amargosa Valley.	4.11 – Land Use, Recreation, Transportation and Access
The proposed Project area is located adjacent to existing residential and other community center uses (e.g., church, fire station, senior center).	4.11 – Land Use, Recreation, Transportation and Access
Native American Religious Concerns	
The EIS should address the existence of Indian sacred sites in the Project area and discuss how the BLM would avoid adversely affecting the physical integrity of sacred sites, if they exist.	3.7 – Historic and Cultural Resources 4.7 – Historic and Cultural Resources
The EIS should address EO 13007 and distinguish it from Section 106 of the NHPA.	3.7 – Historic and Cultural Resources
Noise	
The noise of construction and operation of a solar generating facility may be heard from residential areas near the proposed Project.	4.5 – Noise
Recreation	
No designated recreational uses occur on public lands in the Project area; however, recreational use occurs in the nearby Big Dune Special Recreation Area.	4.11 – Land Use, Recreation, Transportation and Access
Socioeconomic Resources	
Comments about the operation of the proposed facility indicate an interest in the opportunities for employment this Project would generate.	4.9 – Socioeconomic Resources

Table 5-4 Issues Raised During Scoping	
Issues	**Section(s) of the EIS Where Addressed**
The proposed Project may impact public services, including potential population influx and increased service needs (e.g., water supply, school attendance, police and fire protection, etc.).	4.9 – Socioeconomic Resources
Tax benefits may be available to local communities as a result of the proposed Project, including benefits to local tax payers and utility companies and lower property taxes.	4.9 – Socioeconomic Resources
Special Management Areas	
The Project area is not within or adjacent to any special management area. However, nearby special management areas may be sensitive to the uses proposed by the generation facility.	4.6 – Biological Resources 4.12 – Visual Resources
Threatened, Endangered, and Candidate Plant and Wildlife Species	
There may be threatened, endangered, and special status species and habitat in the Project area. What effect would construction and operation of a solar power generating facility and associated facilities have on local population of ESA listed or candidate species or other special status species and suitable habitats?	4.6 – Biological Resources
Transportation	
The existing Amargosa Farm Road is proposed to be rerouted to accommodate the proposed Project and may affect local transportation.	4.11 – Land Use, Recreation, Transportation and Access
Project-related travel may result in increased traffic on Amargosa Farm Road through the local community.	4.11 – Land Use, Recreation, Transportation and Access
Visual Resources	
Construction and operation of a solar facility would introduce multiple structures and modifications to the landscape. The Project area is adjacent to residential areas and community infrastructure (e.g., senior center, fire station school).	4.12 – Visual Resources
The proposed Project may have impacts on scenic quality and scenic vistas of the surrounding desert landscape.	4.12 – Visual Resources
What effects will the proposed Project have on viewers traveling to and from Death Valley National Park?	4.12 – Visual Resources
What effects will safety/night lighting have on the dark skies and stargazing opportunities?	4.12 – Visual Resources
What effects will a 0.25-mile landscape buffer have in mitigation or shielding views? Are there any design techniques that could blend the Project with the natural environment from a visual perspective?	4.12 – Visual Resources
Waste (Hazardous and Solid)	
The solar generating facility has the potential to produce hazardous waste and concentrated de-watered waste from evaporation ponds.	4.13 – Hazardous Materials and Solid Waste

Table 5-4 Issues Raised During Scoping	
Issues	**Section(s) of the EIS Where Addressed**
Water Resources	
Construction and operation of the solar generation facility could result in impacts to the quantity of water, including groundwater and surface water sources. Project activities also have the potential to affect the quality of surface and groundwater as a result of Project discharges (i.e., stormwater, evaporation pond water, effluent).	4.4 – Water Resources
Operation of the proposed solar generating facility would require up to 4,000 acre-feet of water per year. Alternative sources of water should be considered to provide this needed supply. Additionally, other solar generating technologies are available, including photovoltaic, dry-cooling, and hybrid systems.	2.2 – Alternatives Description 4.4 – Water Resources
The EIS should disclose the specific locations, amounts, and well completions of existing water rights, which may be purchased or leased for this Project to facilitate a meaningful analysis of impacts; evaluate the extent to which these water rights have been fully utilized in the past (determine any increases in actual pumping, which may occur as a result of the full utilization of the rights); evaluate the impacts and cumulative impacts of the full utilization of these and other existing rights in the basin; and evaluate the impacts of any changes in consumptive use due to the change to solar energy production.	3.4 – Water Resources 4.4 – Water Resources
Wetlands/Waters of the U.S.	
The Project area is located in portions of the Fortymile Wash Modification of the landscape for construction of the facility could result in alteration of the Fortymile Wash natural drainage patterns in the Project area.	4.4 – Water Resources

5.2.1 Draft EIS Review

The 45-day comment period for public review of the Draft EIS began with the publication of the Notice of Availability in the Federal Register on Friday March 19, 2010. The BLM distributed press releases announcing the dates, locations, and times of the public meetings to local and regional print and broadcast media. The Draft EIS was posted on the BLM Southern Nevada District Office website at: http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/proposed_solar_millenium.html, and distributed to agencies and individual who have requested copies.

Four public meetings were held during the public comment period (from March 19, 2010 – May 3, 2010) to receive comments on the Draft EIS. Dates and locations of these meetings, and the number of attendees are as follows:

Beatty, NV – 10 attendees

Date: April 6, 2010

Time: 6pm – 8pm

Location: Beatty Community Center Hall, 100 S. A Avenue, Beatty

Amargosa Valley, NV – 63 attendees

Date: April 7, 2010

Time: 6pm – 8pm

Location: Amargosa Valley Community Center, 821 E. Amargosa Farm Road, Amargosa Valley

Pahrump, NV – 24 attendees

Date: April 13, 2010

Time: 6pm – 8pm

Location: Pahrump Library, 701 East Street, Pahrump

Las Vegas, NV – 19 attendees

Date: April 14, 2010

Time: 6pm – 8pm

Location: Centennial Hills YMCA, 6601 North Buffalo Drive, Las Vegas

During the 45-day comment period, the BLM received 37 comment documents (e.g., letters, emails, faxes, etc.) from individuals, private companies, interest groups, and federal and state agencies commenting on the Draft EIS. A list of comment documents received, the content of each letter, and BLM's responses to comments are contained in Appendix G of the Final EIS. Each comment letter was assigned a reference number and each comment was identified with a number. Where appropriate, changes and additions are reflected in the Final EIS to respond to comments.

This Final EIS has been distributed with the publication of the Notice of Availability in the Federal Register.

5.2.2 Final EIS

After the public comment period for the Draft EIS, this Final EIS was prepared. This document and Appendix G will include descriptions of public comments and indicates how they have been addressed in the Final EIS. A Notice of Availability accompanied this Final EIS. Per 40 CFR § 1506.10, a 30-day waiting period is required between the publication of the Final EIS and issuance of the ROD.

5.3 FORMAL CONSULTATION WITH INTERESTED AGENCIES AND TRIBAL GOVERNMENT

Federal and state agencies were contacted individually to gather input for the EIS. Other resource management agencies were consulted at the federal and state levels to identify common concerns related to the Proposed Action or Alternatives. Cooperating agencies on this EIS include the U.S. DOD, DOE, NPS, USACE, NDOW, and Nye County.

A BA is being prepared for the Proposed Action and will be submitted to the USFWS as required by Section 7 of the ESA (1973). A species list was requested from the USFWS at the beginning of EIS development. The species list identified any plant and wildlife species listed as threatened, endangered or candidate species within the Project area. At the request of the USFWS, detailed rare plant, sensitive wildlife species, and desert tortoise surveys have been conducted within the Project area. The BLM will continue to coordinate with the USFWS throughout the EIS environmental review and decision-making process.

Nye County has negotiated a Development Agreement with Solar Millennium to mitigate direct impacts to roads, emergency services, and other visual and socioeconomic aspects of the Project. The Development Agreement is available in Appendix F.

The BLM consulted with Native American Tribes that have ancestral ties to, or traditional culture use of, Project area lands. On June 17, 2009, the BLM mailed formal letters to the following tribal groups:

- Pahrump Paiute Tribe
- Las Vegas Paiute Tribe
- Chemehuevi Indian Tribe
- Colorado River Indian Tribes
- Timbisha Shoshone Tribe

The consultation letter, with attachments that explained each proposal in more detail, described the Proposed Action, in addition to five other renewable energy projects being proposed in the Pahrump and Amargosa Valleys of Nye County, Nevada. The BLM requested (1) tribal input regarding any concerns about traditional cultural practices or other issues that might be affected by the Proposed Action, (2) information on how they would like to be involved in the planning process, and (3) names of other individuals that should be notified or consulted about the Project.

On August 5, 2009, the same tribes were e-mailed information about the Project's scoping meetings if they wanted to attend and make comments. A field trip with a representative of the Timbisha Shoshone into the Project area was conducted on September 17, 2009. At this time, no tribal verbal or written religious or cultural concerns have been expressed concerning the proposed Project or Project area.

5.4 LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE EIS WERE SENT

This section lists the agencies, officials, and other interested parties who requested copies of the Final EIS. The BLM filed copies with the EPA, who publishes a Notice of Availability of the Final EIS in the Federal Register. The BLM also distributed paper and electronic (on CD-ROM) copies to federal agencies, key state agencies, elected officials, local libraries, and other requesting parties. The BLM will provide copies to other interested organizations or individuals on request.

5.4.1 Federal Government

USACE
U.S. DOD
U.S. DOE
U.S. EPA
U.S. DOI – NPS
U.S. DOI – USFWS

5.4.2 State Government

Nevada State Clearinghouse – The Nevada State Clearinghouse distribute copies of government documents to various State Offices for comment.

5.4.3 Local Governments

Nye County

5.4.4 Tribal Governments

Pahrump Paiute Tribe
Las Vegas Paiute Tribe
Chemehuevi Indian Tribe
Colorado River Indian Tribes
Timbisha Shoshone Tribe

5.4.5 Other Organizations

Amargosa Conservancy
Center for Biological Diversity
Defenders of Wildlife
Desert Tortoise Council
International Brotherhood of Electrical Workers, Local 357
Ironworkers, Local 433

Las Vegas Valley Water District
League of Women Voters
Los Angeles and Salt Lake Railroad Company
Nevada Conservation League
Nevada Outdoor Recreation Association
Off-Road Business Association
Plumbers and Pipefitters, Local 525
Red Rock Audubon Society
Southern Nevada Building and Construction Trades Council
Southern Nevada Water Authority
Southwest Gas Company Right-of-Way Department
Toiyabe Chapter of the Sierra Club
Valley Electric Association, Inc.
Western Lands Project

5.4.6 Elected Government Officials

Jim Gibbons, State of Nevada Governor
Ed Goedhart, Nevada Assembly
Mike McGinness, Nevada Senate
Shelley Berkley, Nevada 1st District, U.S. House of Representatives
Dean Heller, Nevada 2nd District, U.S. House of Representatives
Dina Titus, Nevada 3rd District, U.S. House of Representatives
John Ensign, U.S. Senate
Harry M. Reid, U.S. Senate

5.4.7 Availability

Copies of the Amargosa Farm Road Solar Energy Project EIS are available for public inspection at the following public libraries and BLM offices.

Amargosa Valley Library
829 E. Farm Rd.
Amargosa Valley, NV 89020

Beatty Library
400 North Fourth St.
Beatty, NV 89003

Pahrump Community Library
701 East St.
Pahrump, NV 89048

BLM, Nevada State Office
1340 Financial Blvd.
Reno, NV 89502

BLM, Southern Nevada District Office
4701 N. Torrey Pines Dr.
Las Vegas, NV 89130

5.5 LIST OF PREPARERS

5.5.1 BLM Core Interdisciplinary Team and Technical Specialty

5.5.1.1 BLM – Nevada State Office

- Ron Wenker – State Director
- Amy Leuders – Associate State Director
- JoLynn Worley – Public Affairs
- Erin Eastvedt – Renewable Energy Project Coordinator

5.5.1.2 BLM – Pahrump and Las Vegas Field Offices

- Mary Jo Rugwell – District Manager
- Patrick Putnam – Field Manager
- Gregory Helseth – Renewable Energy Project Manager
- Mark Chandler – Realty Specialist
- Gayle Marrs-Smith – Acting Pahrump Field Manager
- Hillerie Patton – Public Affairs Specialist
- Jayson Barangan – Natural Resource Specialist
- Michele Bilodeau – Environmental Coordinator
- Lisa Christianson – Environmental Protection Specialist
- Fred Edwards – Botanist
- Dave Fanning – Geologist
- Susan Farkas – Planning and Environmental Coordinator
- Krystal Johnson –Burro Specialist

- Amanda Hamlin – Administrative Professional
- Sarah Peterson – Hydrologist
- Meghan Magill – Hydrologist
- Marc Sanchez – Recreation Planner
- Kathleen Sprowl – Archaeologist/Paleontologist
- Jeff Steinmetz – Lead Planning and Environmental Coordinator

5.6 EIS CONTRACTOR AND SUBCONTRACTORS

Name	Degree(s)	Professional Discipline/Expertise	Years of Experience
Karen Anderson	BA	Document Production, Quality Assurance/Quality Control	26
Emily Belts	BA	Land Use, Recreation, Transportation	4
Garlyn Bergdale	MLA, BS	Senior NEPA Reviewer	33
Glenn Darrington	PhD, MA, BA	Historic and Cultural Resources	22
Avril Fabian	MLA, BS	Land Use, Recreation, Transportation, Special Management Areas	5
Sandra Fairchild	BS, AA	NEPA Project Manager, Water Resources	26
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Barbara Garrison	BS	Biological Resources	27
Rebecca Halbmaier	MSC, BA	Historic and Cultural Resources	8
Mathew Hamilton	MS, BS	EJ, Socioeconomic Resources	12
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Amy Jerome	MBA, BS	Senior NEPA Reviewer	12
Michael Kirby	PhD, MS, BS	Geologic Hazards and Mineral Resources, Soils, Paleontological Resources	20
N. Conrad Langley	MLA, BFA	Visual Resources	12
Diana Nickels	AA	Document Production/Graphics	21
Alison Pruett	MS, BS	Biological Resources	3
Ashley Rosia	BA	Air Quality, Hazardous Materials	1
Michael Burrill – LFR	BA	Environmental Land Use Noise Compatibility	20
Kevin Fowler – LFR	BA	Environmental Noise Control	4

Name	Degree(s)	Professional Discipline/Expertise	Years of Experience
Guy Roemer – GeoTrans	BS, MS	Water Resources, Groundwater Modeling	13
Matt Sauter	MS, BA	Geologic Hazards and Mineral Resources, Soils	2
Marc Schwartz	MLA, BS	Visual Resources	10
Mickey Siegel	MCRP, BS	Management	30
E. Linwood Smith	PhD, MS, BA	Biological Resources	35
Paul Trenter	BSLA	Management	23
Buddy Borden University of Nevada, Reno	MS	Community Economic Development	20
Mariah Evans University of Nevada, Reno	PhD	Sociology (Social Impact Assessment)	27

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CHAPTER 6 - REFERENCES

AECOM. 2010. Air Dispersion Modeling Report for Solar Millennium's Solar Energy Project at Amargosa Farm Road. Prepared by Hamel, R. and Koehler, J. dated July 2, 2010.

Alexander, J. 1998. Nevada native species site survey reports. April and May 1998 *In*: USFWS. 2007b. Ash Meadows Gumplant (*Grindelia fraxino-pratensis*), Five-Year Review: Summary and Evaluation.

Amargosa Valley Area Plan Committee. 2009. Amargosa Valley, Nevada Area Plan. Approved by Nye County Commission on November 3, 2009.

Amargosa Valley School. 2009. Amargosa Valley School website. Available at: http://amargosa.nye.k12.nv.us/. Accessed December 17, 2009.

Andress, R.J., S. McKelvey, C.R. Baldino, D. Weissenfluh, and G.G. Scoppettone. 2009. Hydrologic and aquatic habitat restoration at Fairbanks and Soda Springs, Ash Meadows National Wildlife Refuge to improve habitat quality for the Ash Meadows pupfish, *Cyprinodon nevadensis mionectes*, Ash Meadows speckled dace, *Rhinichthys osculus nevadensis*, and thermal endemic invertebrate species. Presented at the 2009 Annual Symposium of the Desert Fishes Council, Death Valley, CA.

Arizona Game and Fish Department. 2001. *Gopherus agassizii*. Unpublished abstract compiled and edited by the Heritage Data management System, Arizona Game and Fish Department, Phoenix, Arizona. 8p. Available at: http://www.gf.state.az.us/w_c/edits/documents/Gophagas.fi_001.pdf. Accessed: November 12, 2009.

Averill-Murray, R.C., A.P. Woodman and J.M. Howland. 2002. Population ecology of the Sonoran Desert tortoise in Arizona. Pages 109-134 *In:* The Sonoran Desert Tortoise: Natural History, Biology, and Conservation, T.R. Van Devender, Ed. University of Arizona Press, Tucson.

Bagley, C. Longstreet Inn, Casino, and RV Resort. 2009. Personal Communication to M. Hamilton, EPG, Las Vegas, Nevada. December 17, 2009.

Baldino, C. 2006. Biologist at Ash Meadows National Wildlife Refuge, U.S. Fish and Wildlife Service. Personal communication via electronic e-mail to Fred Edwards, Nevada Fish and Wildlife Office, Las Vegas *In*: USFWS. 2007b. Ash Meadows gumplant (*Grindelia fraxino-pratensis*) Five Year Review: Summary and Evaluation. 20 pp.

Barneby, R.C. 1970. A new Astragalus (Fabaceau) from Nevada *In*: Knight, T.A. and G.H. Clemmer. 1987. Status of populations of the endemic plants of Ash Meadows, Nye County, Nevada. A report to U.S. Fish and Wildlife Service, Great Basin Complex, Reno, Nevada in cooperative agreement with Nevada Division of Forestry, Department of Conservation and Natural Resources and Nevada Natural Heritage Program, Carson City, Nevada. Project Agreement No. 86-2-1. 100 pp.

Bates, R.L. and J.A. Jackson. 1987. Star Dune *In:* Glossary of Geology, Third Edition. p. 641. American Geological Institute. Alexandria, Virginia.

Baugh, T. and J.E. Deacon. 1983. The Most Endangered Pupfish. Freshwater and Marine Aquarium. June 1983.

Beatley, J.C. 1977. Endangered plant species of the Nevada Test Site, Ash Meadows, and Central-Southern Nevada. U.S. Energy Research and Development Administration-Contract E (11-1)-2307.

_____. 1976. Vascular plants of the Nevada Test Site and Central-Southern Nevada: ecologic and geographic distributions. Technical Information Center, Office of Technical Information, Energy Research and Development Administration, U.S. Department of Commerce, Springfield. 308 pp.

Beck, D.A. and P.A. Glancy. 1995. *Overview of Runoff of March 11, 1995, in Fortymile Wash and Amargosa River, Southern Nevada:* U.S. Geological Survey Fact Sheet FS-210-95, 4p.

Bedinger, M.S. and J.R. Harrill. 2006. Analytical-regression stage analysis for Devils Hole, Death Valley National Park, Nevada. Journal of American Water Resources Association, Vol. 42 (4):827-839.

Belcher, W.R., ed. 2004. Death Valley Regional Flow System, Nevada and California—Hydrogeologic framework and transient groundwater flow model. U.S. Geological Survey Scientific Investigations Report 2004-5205, 408 p.

Berry, K.H. and P. Medica. 1995. Desert Tortoises in the Mojave and Colorado Deserts. Pages 135–137 *In:* Our Living Resources: A Report to the Nation on the Distribution, Abundance, and Health of U.S. Plants, Animals, and Ecosystems, E.T. LaRoe, G.S. Farris, C.E. Puckett, P.D. Doran and M.J. Mac, eds. U.S. Department of the Interior, Washington.

Bio-West, Inc. 2009. Fairbanks_RarePlant_Points shapefile. Unpublished data provided by Ash Meadows National Wildlife Refuge.

_____. 2008a. Ash Meadows National Wildlife Refuge vegetation mapping and rare plant survey. Draft progress report submitted to U.S. Fish and Wildlife Service by Bio-West, Inc. USFWS. 2009a. Ash Meadows milkvetch (*Astragalus phoenix*) Five Year Review: Summary and Evaluation. 33 pp.

_____. 2008b. Ash Meadows National Wildlife Refuge vegetation mapping and rare plant survey. Draft progress report submitted to U.S. Fish and Wildlife Service by Bio-West, Inc. *In:* U.S. Fish and Wildlife Service. 2009d. Spring-loving centaury (*Centaurium namophilum*), Five-Year Review: Summary and Evaluation.

Birkeland, P.W. 1999. Soils and Geomorphology, 3rd Edition. Oxford University Press. New York and Oxford.

Blanton, J.O., III. 1992. Nevada Test Site Flood Inundation Study, Part of U.S. Geological Survey Flood Potential and Debris Hazard Study, Yucca Mountain Site for United States Department of Energy, Office of Civilian Radioactive Waste Management. Denver, Colorado: U.S. Department of the Interior, Bureau of Reclamation. TIC: 205029.

Blythe, A.K., D.E. Swann, R.J. Steidl and E.W. Stitt. 2004. Movement patterns of translocated desert tortoises. Page 80 *In:* The Proceedings of the Desert Tortoise Council, D.K. Duncan, G. Stewart, T.B. Egan, M. Tuegel and D. Pond, eds. The 28th Annual meeting and Symposium of the Desert Tortoise Council; February 21-23, 2003, Las Vegas, Nevada. Wrightwood, California: Desert Tortoise Council, Inc. 183 pp.

Borup, H.J. 2004. Soil Survey of Nye County, Nevada, Southwest Part. United States Department of Agriculture, National Resource Conservation Service.

Bowlin, J. 2009. Horizon Academy. Personal Communication to M. Hamilton, EPG, Las Vegas, Nevada. December 17, 2009.

Bradley, P.V., M.J. O'Farrell, J.A. Williams and J.E. Newmark. 2006. The Revised Nevada Bat Conservation Plan. Nevada Bat Working Group. Reno, Nevada. 216 pp.

Bramble, D. M. 1971. Functional morphology, evolution, and paleoecology of gopher tortoises. Berkeley, CA: University of California. Dissertation.

Brooks, M.L., C.M. D'Antonio, D.M. Richardson, J.B. Grace, J.E. Keeley, J.M. DiTomaso, R.J. Hobbs, M. Pellant and D. Pike. 2004. Effects of invasive alien plants on fire regimes. Bioscience 54(57):677-688 *In*: USFWS. 2009c. Ash Meadows milkvetch (*Astragalus phoenix*), Five-Year Review: Summary and Evaluation.

Broome, R.C. 1981. A new variety of Centaurium namophilum (Gentianaceae) from the Great Basin. Great Basin Naturalist 41:192-197.

Brown, D.E. 1994. *Biotic Communities Southwestern United States and Northwestern Mexico.* University of Utah Press.

Brunson, Mark W. and Brent S. Steel. 1994. National Public Attitudes toward Federal Rangeland Management. Rangelands 16:77-81.

Buqo, T. 2002. *Nye County Resource Plan.* Department of Natural Resources and Federal Facilities. Consulting Hydrogeologist.

Bureau of Land Management (BLM). 2010. Visual Resource Management System Objectives. Available at: http://www.blm.gov/nstc/VRM/ vrmsys.html.

_____. 2009a. Fact sheet for Ash Meadows gumplant. Accessed on November 12, 2009. http://www.blm.gov/ca/pa/ssp/plants/grindelia_fraxino_pratensis %20-plant.html.

_____. 2009b. Legacy Rehost 2000. Accessed December 12, 2009.

_____. 2008. Potential Fossil Yield Classification (PFYC) System. Instructional Memorandum 2008-2009.

_____. 1998. Las Vegas Resource Management Plan and Final Environmental Impact Statement and Record of Decision.

Bureau of Land Management (BLM) and Fish and Wildlife Service (USFWS). 2000a. Environmental Assessment for the Proposed Land and Mineral Withdrawal at Ash Meadows National Wildlife Refuge, Nye County, Nevada *In:* USFWS. 2007b. Ash Meadows Gumplant (*Grindelia fraxino-pratensis*), Five-Year Review: Summary and Evaluation.

_____. 2000b. Environmental Assessment for the Proposed Land and Mineral Withdrawal at Ash Meadows National Wildlife Refuge, Nye County, Nevada *In:* USFWS. 2009c. Ash Meadows Milkvetch (*Astragalus phoenix*), Five-Year Review: Summary and Evaluation.

_____. 2000c. Environmental Assessment for the Proposed Land and Mineral Withdrawal at Ash Meadows National Wildlife Refuge, Nye County, Nevada *In:* USFWS. 2009d. Spring-loving centaury (*Centaurium namophilum*), Five-Year Review: Summary and Evaluation. 32 pp.

Bureau of Land Management (BLM) and U.S. Fish and Wildlife Service (USFWS), and California Department of Fish and Game. 1989. Environmental Assessment for Selected Control of the Common Raven to Reduce Desert Tortoise Predation in the Mojave Desert, California. Bureau of Land Management, Riverside, California.

Bureau of Land Management (BLM) and U.S. Forest Service. 2009. Geocommunicator-National Integrated Land System. Available at: http://www.geocommunicator.gov/GeoComm/index.shtm. Accessed multiple dates in 2009.

Caicco, S. 2005. Threatened and Endangered Plant Species- 2005 Field Survey Report. U.S. Fish and Wildlife Service, Ash Meadows National Wildlife Refuge, Nye County, Nevada.

Cameron, J, Amargosa Valley Planning Commissioner. 2009. Personal communication to A. Fabian, EPG, Phoenix, Arizona, regarding land use. December 16, 2009.

Castor, S.B., B.T. McLaurin, S. Ludington and K.S. Flynn. 2006. Chapter L: Mineral Resource Potential of the Big Dune Area of Critical Environmental Concern, Nye County, Nevada. *In:* Mineral Resource Assessment of Selected Areas in Clark and Nye Counties, Nevada. S. Ludington ed.USGS Scientific Investigations Report 2006-5197.

Center for Biological Diversity. 2009. Natural history of Ash Meadows gumplant (*Grindelia fraxino-pratensis).* Available at: http://biologicaldiversity.org/species/plants/Ash_Meadows_gumplant/natural_history.html. Accessed on November 12, 2009.

Chambers, J.C. 2006. Climate Change and the Great Basin. *In:* proceedings, Collaborative Watershed Research and Management Conference: Nov. 28-30, 2006, Reno, NV.

Clark County. 2009. Amended Final Budget, County of Clark, FY 2009-2010.

Cochrane, S.A. 1981. Unpublished status report on *Grindelia fraxino-pratensis* Reveal and Beatley *In*: USFWS. 2007b. Ash Meadows gumplant (*Grindelia fraxino-pratensis*) Five Year Review: Summary and Evaluation. 20 pp.

Community Environmental Monitoring Program. 2009. For Amargosa Valley CEMP Station; accessed on November 11, 2009. http://www.cemp.dri.edu/cemp/climate/?stn=amar.

Conservation Management Institute (CMI). 1996. Draft Ivesia, Ash Meadows. Available at: http://fwie.fw.vt.edu/www.esis/lists/e701036.htm. Accessed November 17, 2009.

Converse Consultants. 2008. Canyon Resources Reward Mine Biological Assessment, Nye County, NV. CR Briggs Corporation.

Corn, P.S. 1994. Recent Trends of Desert Tortoise Populations in the Mojave Desert. Pages 85 – 93 *In:* Biology of North American Tortoises, R.B. Bury and D.J. Germano, eds. Fish and Wildlife Research Publication #13.

Cronquist, A. 1972. A new variety of *Enceliopsis nudicaulis* (Ateraceae) from southern Nevada. Bull. Torrey Bot. Club. 99:246-248.

Crumley, C.R. 1994. Phylogenetic systematic of North American tortoises (genus *Gopherus*): Evidence for the classification. Page 7-32 *In:* Biology of North American Tortoises, R.B. Bury and D.J. Germano, eds. Fish and Wildlife Research Publication #13.

Czarnecki, J.B. 1997. Geohydrology and Evapotranspiration at Franklin Lake Playa, Inyo County, California. USGS Water Supply Paper 2377.

Denny, C.S. and H. Drewes. 1965. Geology of the Ash Meadows Quadrangle, Nevada-California. U.S. Geological Survey Bulletin 1181-L, L1-L56, map scale 1:62,500.

Department of Energy (DOE). 2008. Final Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada. DOE/EIS-0250F-S1, June 2008.

dePolo, C.M. 2008. Quaternary Faults in Nevada. Nevada Bureau of Mines and Geology Map 167.

Desert Gazette. 2009. National Wildlife Refuges-Ash Meadows. Available at: http://digital-desert.com/ash-meadows/ash-meadows.14.0.html.

Dominguez, C. 2006. Insect Conservation Biology: *Ambrysus amargosus*, Ash Meadows Naucorid. Available at: http://courses.cit.cornell.edu/icb344/abstracts/Ash-meadows-naucorid.htm.

Eakin, T.E., 1963, Ground-water appraisal of Pahranagat and Pahroc Valleys, Lincoln and Nye Counties, Nevada: Nevada Department of Conservation and Natural Resources, Ground-Water Resources - Reconnaissance Report 21, 36 p.

Eaton, G.P. 1982. The Basin and Range Province: Origin and Tectonic Significance. Annual Review of Earth and Planetary Sciences. Vol. 10, p. 409-440.

EDEN, Inc. 2009. Amargosa Business Tour. Available at: http://www.eden-nv.com/Am_Tour.htm. Accessed December 17, 2009.

EDEN, Inc., 2007. Comprehensive Economic Development Strategy for Nye County. May 2007.

Edwards, T., E.W. Stitt, C.R. Schwalbe and D.E. Swann. 2004. *Gopherus agassizii* (desert tortoise) movement. Herpetological Review 35 (4): 381-382.

ENSR. 2008. Beacon Solar Energy Project Application for Certification. Filed March 14, 2008.

Ernst, C.H., J.E. Lovich and R.W. Barbour. 1994. Turtles of the United States and Canada. Smithsonian Institution Press, Washington, D.C.

Esque, T.C. and E.L. Peters. 1994. Ingestion of Bones, Stones, and Soil by Desert Tortoises. Pages 105-111 *in* Biology of North American Tortoises, R.B. Bury and D.J. Germano, eds. U.S. Department of Interior, Fish and Wildlife Research Publication 13.

Environmental Systems Research Institatute (ESRI). 2010. 2010/2015 Updated Demographics Data. Environmental Systems Research Institute, Redlands, CA. Available at: www.esri.com.

Farrell, J.P. 1989. Natural history observations of raven behavior and predation on desert tortoises. Proceedings of the Symposium of the Desert Tortoise Council 1989.

Fenneman, Nevin M. 1931. *Physiography of the Western United States.* New York: McGraw-Hill Book Company, New York.

Fuller, Lon. 2010. Thank you from Amargosa Volunteer Fire Department. Letter to the Editor in Amargosa Valley Sun, Spring 2010.

Garside, L.J. and R.H. Hess. 2007. Petroleum Data Map of Nevada. Nevada Bureau of Mines and Geology Map 162.

Germano, D.J., R.B. Bury, T.C. Esque, T.H. Fritts and P.A. Medica. 1994. Range and habitats of the desert tortoise. Pages 73-84 *in* Biology of North American Tortoises, R.B. Bury and D.J. Germano, eds. U.S. Department of the Interior, Fish and Wildlife Research Publication #13.

Glenne, G. 1998. Nevada native species site survey reports. *In*: USFWS. 2007b. Ash Meadows Gumplant (*Grindelia fraxino-pratensis*), Five-Year Review: Summary and Evaluation.

Goddard Institute for Space Studies. 2007. Annual Mean Temperature Change for Three Latitude Bands. Datasets and Images. GISS Surface Temperature Analysis, Analysis Graphs and Plots. New York, New York.

Available on the Internet: http://data.giss.nasa.gov/gistemp/graphs/Fig.B.lrg.gif.

Grime, J.P. 1977. Evidence for the existence of three primary strategies in plants and its relevance to ecological and evolutionary theory. The American naturalist 111(982): 1169-1194 *In*: USFWS. 2009c. Ash Meadows milkvetch (*Astragalus phoenix*) Five Year Review: Summary and Evaluation. 33 pp.

Harrill, J.R. and D.E. Prudic. 1998. Aquifer systems in the Great Basin Region of Nevada, Utah, and adjacent states--Summary report. U.S. Geological Survey Professional Paper 1409-A, 66 pp.

Hartman, S. 2002. California Plant Communities. Interactive CD-ROM.

Hess, R.H., S.P. Fitch and S.N. Warren. 2004. Nevada Oil and Gas Well Database (NVOILWELL). Nevada Bureau of Mines and Geology Open File Report 04-1.

Intergovernmental Panel on Climate Change (IPCC). 2001. Third Assessment Report: Climate Change. Cambridge University Press. Availble online at: www.ipcc.ch/pub/online.htm.

_____. 2007. Climate Change 2007: The Physical Basis (Summary for Policy Makers). Cambridge University Press. Available at: http://www.ipcc.ch/SPMfeb07.pdf.

Jacobson, E. R. 1993a. Implications of infectious diseases for captive propagation and introduction programs of threatened/endangered reptiles. J. Zoo Wildl. Med. 24(3):245–255. Knight and Leavitt 2006

Jennings, W.B. 1997. Habitat use and food preferences of the desert tortoise, *Gopherus agassizii*, in the western Mojave Desert and impacts of off-road vehicles. Pages 42-45 *in* Proceedings of Conservation, Restoration, and Management of Tortoises and Turtles – An International Conference, J. Van Abbema, ed. New York Turtle and Tortoise Society. Available at: http://www.tortoise-tracks.org/publications/jennings.html.

Johnson, M.J. 1987. Groundwater discharge by evapotranspiration in a desert environment of southern Nevada. U.S. Geological Survey Water-Resources Investigations Report 94-4124, 20 p. Available at: http://pubs.er.usgs.gov/usgspubs/wri/wri944124.

Katzenstein K.W. and J.W. Bell. 2005. InSAR Reveals a Potpourri of Deformation Signals in the Yucca Mountain—Amargosa Valley—Death Valley Region, Southwestern Nevada/Southeastern California. American Geophysical Union Fall Meeting Abstracts.

Kilroy, K.C. 1991. GroundWater Conditions in Amargosa Desert, Nevada-California, 1952-1987. U.S. Geological Survey Water Resources Investigations Report 89-4101.

Knight, T.A. and G.H. Clemmer. 1987. Status of populations of the endemic plants of Ash Meadows, Nye County, Nevada. A report to U.S. Fish and Wildlife Service, Great Basin

Complex, Reno, Nevada in cooperative agreement with Nevada Division of Forestry, Department of Conservation and Natural Resources, and Nevada Natural Heritage Program, Carson City, Nevada. Project Agreement No. 86-2-1. 100 pp.

Laczniak, R.J., G.A. DeMeo, S.R. Reiner, J.L. Smith and W.E. Nylund. 1999. *Estimates of Groundwater Discharge as Determined from Measurements of Evapotranspiration, Ash Meadows Area, Nye County, Nevada.* Water-Resources Investigations Report 99-4079. Carson City, Nevada. U.S. Geological Survey. TIC: 247813.

Lamb, T., J.C. Avise and J.W. Gibbons. 1989. Phylogeographic patterns in mitochondrial DNA of the desert tortoise (*Xerobates agassizii*), and evolutionary relationships among North American gopher tortoises. Evolution 43:76-87.

Las Vegas Audubon Society. 1997. Birds, Ash Meadows National Wildlife Refuge, Nevada. Las Vegas Audubon Society. 20 pages. Jameston, ND: Northern Prairie Wildlife Research Center Online. Available at: http://www.npwrc.usgs.gov/resource/birds/chekbird/r1/ashmead.htm.

Lawler, H.E. No date. A Natural History of the Desert Tortoise, *Gopherus [Xerobates] agassizii.* International BioPark. Available at: http://www.biopark.org/Destort1.html. Accessed: November 12, 2009.

Lovich, J. 1999. Synopsis of conservation information on the desert tortoise. U.S. Geological Survey, Western Ecological Research Center. Available at: http://www.werc.usgs.gov/hq/synopsis.htm. Accessed: November 12, 2009.

Malmberg, G.T. 1967. Hydrology of the valley-fill and carbonate-rock reservoirs, Pahrump Valley, Nevada-California. USGS Water Supply Paper 1832.

Malmberg, G.T. and T.E. Eakin. 1962. Groundwater appraisal of Sarcobatus Flat and Oasis Valley, Nye and Esmeralda Counties, Nevada. Nevada Dept of Conservation and Natural Resources - Groundwater Resources-Reconnaissance Series Report 10.

Mapula, J., O. Feuerbacher, S. Bonar and K. Wilson. 2009. Laboratory replication of Devils Hole algal and zooplankton communities. Presented at the 2009 Annual Symposium of the Desert Fishes Council, Death Valley, CA.

McKelvey, S. and K. Taylor. 2009. Conversation between Sharon McKelvey (USFWS), Kathie Taylor (Argenta Ecological Consultants), and Alison Pruett (EPG) on 23 November 2009 at Ash Meadows National Wildlife Refuge.

Morefield, J.D. 1991. Unpublished field survey for *Centaurium namophilum.* Reveal, Broome and Beatley in the vicinity of Beatty, Nye County, Nevada, 10-11 July 1991.

Moreo, M.T., K.J. Halford, R.J. La Camera and R.J. Laczniak. 2003. Estimated groundwater withdrawals from the Death Valley regional flow system, Nevada and California, 1913-98. U.S. Geological Survey Water-Resources Investigations Report 03-4245, 28 p. Available at: http://pubs.usgs.gov/wri/wrir034245/.

Mozingo, H.N. and M. Williams. 1980. Threatened and endangered plants of Nevada: an illustrated manual. Submitted to U.S. Fish and Wildlife Service and Bureau of Land Management. 268 pp.

Munz, P.A. 1974. A Flora of Southern California. University of California Press, Berkley California. Pg 351.

Naiman, R.J. 1979. Preliminary food studies of *Cyprinodon mascularius* and *Cyprinodon nevadensis* (Cyprinodontidae). Southwestern Naturalist 24:538-541.

National Park Service (NPS). 2009. Desert tortoise. Available at: http://www.nps.gov/moja/planning/ tort.htm. Accessed: November 12, 2009.

NatureServe Explorer. 2009. An Online Encyclopedia of Life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available at: http://www.natureserve.org/explorer. Accessed: multiple dates in 2009.

Nevada Bureau of Mines and Geology (NBMG). 2008. The Nevada Mineral Industry 2008.

Nevada Department of Education. 2009. 2008-2009 Private School Directory. Available at: http://nde.doe.nv.gov/SD_PrivateSchools.htm. Accessed December10, 2009.

Nevada Department of Employment, Training and Rehabilitation – Research and Analysis Bureau. 2009. Local Area Unemployment Statistics. Available at: http://www.nevadaworkforce.com. Accessed December 10, 2009.

Nevada Department of Wildlife (NDOW). 2003. Conservation strategy outline for local planning groups as part of the statewide effort for sage grouse conservation. Available at: www.ndow.org/wild/conservation/sg/resource/App10_suggest.pdf.

Nevada Division of Environmental Protection (NDEP) 2009. Permitting & Regulatory Requirements. Available at: http://www.ndep.nv.gov/admin/guide.htm. Accessed on November 12, 2009.

Nevada Division of Water Resources. 2010a. Pumpage Inventories. Available at: http://images.water.nv.gov/images/Pumpage%20Inventories/default.aspx. Accessed multiple occasions in 2009 and 2010.

_____. 2010b. Hydrographic Abstract for Amargosa Desert Hydrographic Basin #230. Available at: http://water.nv.gov/. Accessed multiple occasions in 2010.

_____. 2010c. Well Logs for Amargosa Desert Hydrographic Basin #230. Available at http://water.nv.gov/.

_____. 2009a. Water Rights Database; Information obtained for Water Rights Certificate 5717. Available at: http://water.nv.gov/water%20Rights/permitdb/permitdb_disclaimer.cfm.

_____. 2009b. Nevada Water Law: An Overview. Available at: http://water.nv.gov/Water%20Rights/Water%20Law/waterlaw.cfm. Accessed on November 12, 2009.

Nevada Natural Heritage Program (NNHP). 2009. Nevada Sensitive Animal List. Available at: http://heritage.nv.gov/sensanim.htm. Accessed: November 12, 2009.

_____. 2001. Rare Plant Fact Sheet. Available at: http://heritage.nv.gov/atlas.

Nevada Office of the Labor Commissioner. 2010. 20009 Prevailing Wage Rates for Nye County. Availabile at: http://www.laborcommissioner.com/10rates/nye.html.

Nevada Renewable Energy Transmission Access Advisory Committee. 2009. Phase II Executive Summary and Report. July 1, 2009. Available at: http://www.retaac.org/ Home/documents.

Nevada State Demographer's Office. 2009. Nevada County Population Estimates July 1, 1986 to July 1, 2008, Includes Cities and Towns.

Nevada State Engineer. 2007. In the Office of the State Engineer of the State of Nevada, Order 1197.

Nichols, W.D. 2000. Regional groundwater evapotranspiration and groundwater budgets, Great Basin, Nevada. U.S. Geological Survey Professional Paper 1628, 82 p. Available at: http://pubs.er.usgs.gov/usgspubs/pp/pp1628.

Novosak, B., USFWS Wildlife Biologist. 2010. Personal communication to J. Barangan, BLM, Las Vegas, NV, regarding Ash Meadows sunray. September 13, 2010.

Nye County. 2010. A Development Agreement by and between Nye County and Amargosa Valley Solar 1, LLC dated June 1, 2010, pending approval.

_____. 2008. Nye County, Nevada Comprehensive Annual Financial Report for the Fiscal Year Ended June 30, 3008. [2009 IN EIS]

Nye County School District. 2009. Nye County Fast Facts 2008-2009. Available at: http://www.nye.k12.nv.us. Accessed December 10, 2009.

Oftedal, O.T. 2002. Nutritional Ecology of the Desert Tortoise in the Mojave and Sonoran Deserts. Pages 194 – 241 *in* The Sonoran Desert Tortoise: Natural History, Biology, and Conservation, T. R. Van Devender, ed. University of Arizona Press, Tucson.

Pahrump Valley Times. 2010. Enrollment is up at GBC Pahrump Center, by Mark Waite, September 3, 2010.

Parker, M.S., D.S. Weissenfluh, S. Goodchild, C.R. Baldino, L. Simons, C. Lundblad and P. Cunningham. 2009. Habitat restoration and long-term conservation of Ash Meadows

naucorids. Presented at the 2009 Annual Symposium of the Desert Fishes Council, Death Valley, CA.

Parker, M.S., G.G. Scoppettone, and M.B. Neilsen. 2000. Ecological investigation of two naucorid species (*Ambrysus amargosus* and *A. relictus*) endemic to thermal springs of the Ash Meadows National Wildlife Refuge. U.S. Fish and Wildlife Service, Southern Nevada Field Office. Document Control Number 14320-8-6002.

Pavlik, B.M., A.E. Stanton and M. Bernegger. 2006. Managing Populations of Rare Plants at Ash Meadows National Wildlife Refuge. Demographic Survey and Habitat Quality Assessment to Recover *Astragalus phoenix*. Unpublished report prepared for the U.S. Fish and Wildlife Service, December 2006 *In*: USFWS. 2009c. Ash Meadows milkvetch (*Astragalus phoenix*), Five-Year Review: Summary and Evaluation.

Pavlik, B.M. and E.A. Manning. 1986. Endangered Species Information System Species Workbook Part II-Species Biology. Workbook compiled for the spring-loving centaury *In*: USFWS. 2009d. Spring-loving centaury (*Centaurium namophium*), Five-Year Review: Summary and Evaluation.

Peterson, M.D., A.D. Frankel, S.C. Harmsen, C.S. Mueller, K.M. Haller, R.L. Wheeler, R.L. Wesson, Y. Zeng, O.S. Boyd, D.M. Perkins, N. Luco, E.H. Field, C.J. Wills and K.S. Rukstales. 2008. Documentation for the 2008 update of the United States National Seismic Hazard Maps. USGS Open-file Report: OF 08-1128.

Phillip, R., NDEP Staff Engineer. 2009. Personal communication to S. Fairchild, EPG, Las Vegas, Nevada, regarding emission sources. December 30, 2009

Pimental, D., R. Zuniga and D. Morrison. 2005. Update on the environmental and economic costs associated with alien-invasive species in the United States. *In*: USFWS. 2007b. Ash Meadows gumplant (*Grindelia fraxino-pratensis*) Five Year Review: Summary and Evaluation. 20 pp.

Pistrang, M.A. and F. Kunkel. 1964. A brief geologic and hydrologic reconnaissance of the Furnace Creek Wash area, Death Valley National Monument, California. U.S. Geological Survey Water-Supply Paper 1779-Y, 35 p.

Powell, T. IMV General Manager. 2009. Personal communication to S. Fairchild, EPG, Las Vegas, Nevada. December 16, 2009.

Rautenstrauch, K.R. and T.P. O'Farrell. 1994. Relative abundance of desert tortoises on the Nevada test site. Department of Energy. EGG 11265-2039. Available at: http://www.osti.gov/bridge/servlets/ purl/10121823-ojdq5a/native/10121823.pdf

Reveal, J.L. 1978. Status report on *Nitrophila mohavensis* Munz and Roos (Amargosa niterwort). Unpublished report to U.S. Department of Interior.

Reveal, J.L., C.R. Broome and J.C. Beatley. 1973. A new *Centaurium* (Gentianaceae) from the Death Valley region of Nevada and California *In*: USFWS. 2009d. Spring-loving centaury (*Centaurium namophium*), Five-Year Review: Summary and Evaluation.

Rollins, K., A. Castledine, S. Swanson, M.D.R. Evans, K. McAdoo, B. Schultz, M. Havercamp, and R. Wilson. 2007. The 2005 Nevada Rangeland Vegetation Survey: General Public Questionnaire and Survey of Responses. University of Nevada Cooperative Extension Special Publication No. SP07-11. 44pp.

Rowley, P.D. 2003. Geologic Controls ion the Hydrology of the Lower Carson Slough Area, Amargosa Desert, Nye County, Nevada and Inyo County, California. Report prepared for the Bureau of Land Management, Barstow, California.

Rush, F.E. 1968. Index of hydrographic areas in Nevada: Nevada Division of Water Resources, Information Report 6, 38 p.

Sada, D.W. and A. Mozejko. 1984. Environmental Assessment: Proposed acquisition to establish Ash Meadows National Wildlife Refuge, Nye County, Nevada. U.S. Department of the Interior, Fish and Wildlife Service, Portland, Oregon.

Savard, C.S. 1998. Estimated Groundwater Recharge from Streamflow in Fortymile Wash Near Yucca Mountain, Nevada. Water-Resources Investigations Report 97-4273. Denver, Colorado: U.S. Geological Survey. TIC: 236848.

Seaber, P.R., E.D. Stowers and R.H. Pearl. 1997. Bibliography of Reports on Studies of the Geology, Hydrogeology, and Hydrology at the Nevada Test Site, Nye County, Nevada, from 1951 to 1996. Submitted to Nevada Operations Office, U.S. Department of Energy. Publication No. 45156.

Slate, J.L., M.E. Berry, P.D. Rowley, C.J. Fridrich, K.S. Morgan, J.B. Workman, O.D. Young, G.L. Dixon, V.S. Williams, E.H. McKee, D.A. Ponce, T.G. Hildenbrand, W.C. Swadley, S.J. Lundstrom, E.B. Ekren, R.G. Warren, J.C. Cole, R.J. Fleck, M.A. Lanphere, D.A. Sawyer, S.A. Minor, D.J. Grunwald, R.J. Lancziak, C.M. Menges, J.C. Yount and A.S. Jayko. 1999. Digital Geologic Map of the Nevada Test Site and Vicinity, Nye, Lincoln, and Clark Counties, Nevada and Inyo County, California. USGS Open-file Report: OF 99-554-A.

Slater Hanifan Group. 2009. Conceptual Stormwater Control Plan, Amargosa Farm Road Solar Project.

Society of Vertebrate Paleontology. 1995. Assessment and Mitigations of Adverse Impacts to Nonrenewable Paleontologic Resources: Standard Guidelines. Society of Vertebrate Paleontology News Bulletin: vol. 163, p. 22-27.

Soltz, D.L. and R.J. Naiman. 1978. The natural history of the native fishes in the Death Valley system. Natural History Museum of Los Angeles County, California, 30:1-77.

Spangenberg, E.K. 1995. Plants Eaten by Juvenile Desert Tortoises in the Central Mojave Desert. Paper presented at the National Biological Service Desert Tortoise Symposium, 1995. Internet site: http://www.tortoise-tracks.org/publications/ksplants.html. Accessed: November 12, 2009.

Stebbins, R.C. 1985. Western Reptiles and Amphibians. Houghton Mifflin Company, New York, New York.

Stewart, J.H. 1980. Geology of Nevada: Nevada Bureau of Mines and Geology Special Publication 4.

Stitt, E.W. and C. Davis. 2003. *Gopherus agassizii* (Desert Tortoise). Caliche Mining. Herpetological Review. 34 (1): 57.

Stonestrom, D.A., D.E. Prudic, R.J. Laczniak, K.C. Akstin, R.A. Boyd and K.K. Henkelman. 2003. Estimates of deep percolation beneath irrigated fields, native vegetation, and the Amargosa River channel, Amargosa Desert, Nye County, Nevada. U.S. Geological Survey Open-File Report 03–104, 83 p.

Stonestrom, D.A., D.E. Prudic, M.A. Walvoord, J.D. Abraham, A.E. Stewart-Deaker, P.A. Glancy, J. Constantz, R.J. Laczniak and B.J. Andraski. 2007. Chapter E: Focused Groundwater Recharge in the Amargosa Desert Basin *In:* Groundwater Recharge in the Arid and Semiarid Southwestern United States. USGS Professional Paper 1703.

Sweetkind, D.S., W.R. Belcher, C.C. Faunt and C.J. Potter. 2004. Chapter B – Geology and Hydrogeology *In:* Death Valley Regional Groundwater Flow System, Nevada and California – Hydrogeologic Framework and Transient Groundwater Flow Model. W.R. Belcher, ed. USGS Scientific Investigations Report 2004-5205.

Tanko, D.J. and P.A. Glancy. 2001. Flooding in the Amargosa River drainage basin, February 23-24, 1998, southern Nevada and eastern California, including the Nevada Test Site. Available at: http://pubs.usgs.gov/fs/fs-036-01/text/fs03601.htm.

Thompson, A.J., J.E. Riddle and J.R. Wedding. 2009. A Class III Cultural Resource Investigation of 7,798.24 Acres for the Proposed Amargosa Farm Road Solar Plant in Amargosa Valley, Nye County, Nevada. HRC Report 2009-2-F, BLM Report Number 5-2625.

Tierra Data. 2009. Biological Resources Surveys for Amargosa Farm Road Solar Project. Unpublished.

Toiyabe Spotted Frog Technical Team. 2004. Columbia Spotted Frog (Rana luteiventris) Toiyabe Great Based Subpopulation Long-term Monitoring Plan. Available at: http://www.ndow.org/wild/conservation/frog/toy/Longterm_mont_plan_final2.pdf.

Tracy, C.R. 2001. Recovering the Desert Tortoise with Science and creative management. University of Nevada Biological Resources Research Center. Available at: http://www.brrc.unr.edu/data/docs/nbisp96/nbitort.html. Accessed: November 12, 2009.

Turner, F.B. 1986. Management of the Desert Tortoise in California. *in*: Management of the Desert Tortoise in California: Proceedings of the Symposium; 1985 March 3-5; Malibu, California. In: Herpetologica. 42 (1): 57-58.

U.S. Census Bureau. 2010. Journey to Work and Place of Work. Available at: http://www.census.gov/population/www/socdemo/journey.html.

_____. 2009a. Census 2000. Available at: http://www.census.gov/main/www/ cen2000.html.

_____. 2009b. 2006-2008 American Community Survey 3-year Estimates. Available at: http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=ACS.

U.S. Department of Agriculture (USDA), National Agricultural Statistics Service. 2009. 2007 Census of Agriculture. Available at: http://www.agcensus.usda.gov/Publications/2007/ Full_Report/index.asp

_____. Natural Resources Conservation Service (USDA-NRCS). 1993. National Soil Survey Handbook.

U.S. Department of Commerce, Bureau of Economic Analysis. 2009. Regional Economic Accounts. Available at: http://www.bea.gov/regional/reis. Accessed December 10, 2009.

U.S. Department of Transportation – Federal Highway Administration. 2006. Section 9.0 - Construction Equipment Noise Levels and Ranges *In:* Federal Highway Administration Highway Construction Noise Handbook. Available at: http://www.fhwa. dot.gov/environment/noise/handbook/ index.htm.

U.S. Environmental Protection Agency (EPA). Safe Drinking Water Standards. http://water.epa.gov/lawsregs/rulesregs/sdwa/index.cfm

_____. 1998. Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis. Washington, D.C.

_____. 1973. Information on Levels of Environmental Noise Requisite to protect Public Health and Welfare with an Adequate Margin of Safety. Office of Noise Abatement and Control.

U.S. Fish and Wildlife Service (USFWS). 2010. Ash Meadows National Wildlife Refuge: Threatened and Endangered Species. Available online at: http://www.fws.gov/ desertcomplex/ashmeadows/endangered.htm.

_____. 2009a. Shapefiles provided by Ash Meadows National Wildlife Refuge for Rare Plants, Ash Meadows Naucorid, Ash Meadows Amargosa Pupfish, Warm Springs Pupfish, and Ash Meadows Speckled Dace.

_____. 2009b. Desert National Wildlife Refuge Complex: Ash Meadows, Desert, Moapa Valley, and Pahranagat National Wildlife Refuges: Final Comprehensive Conservation Plan and Environmental Impact Statement: Clark, Lincoln, and Nye Counties, Nevada.

USFWS, Pacific Southwest Region, Sacramento, California. 401 pp. +appendices. Available at: http://www.fws.gov/desertcomplex/ccp.htm.

_____. 2009c. Ash Meadows milkvetch (*Astragalus phoenix*), Five-Year Review: Summary and Evaluation.

_____. 2009d. Spring-loving centaury (*Centaurium namophium*), Five-Year Review: Summary and Evaluation.

_____. 2009e. Devils Hole Pupfish. Available at: http://www.fws.gov/desertcomplex/pupfish/devilshole.htm. Accessed on: November 12, 2009.

_____. 2009f. Desert National Wildlife Refuge Complex: Ash Meadows, Desert, Moapa Valley, and Pahranagat National Wildlife Refuges – Final Comprehensive Conservation Plan and Environmental Impact Statement Summary – August 2009. 44pp.

_____. 2008. Draft revised recovery plan for the Mojave Population of the desert tortoise (*Gopherus agassizii*). USFWS, California and Nevada Region, Sacramento, California. 209 pp.

_____. 2007a. Amargosa Niterwort (*Nitrophila mohavensis*) Five Year Review: Summary and Evaluation. 26 pp.

_____. 2007b. Ash Meadows gumplant (*Grindelia fraxino-pratensis*) Five Year Review: Summary and Evaluation. 20 pp.

_____. 1994. Desert tortoise (Mojave Population) recovery plan. USFWS, Portland, Oregon. 73 pp. + appendices.

_____. 1990. Recovery plan for the endangered and threatened species of Ash Meadows, Nevada. USFWS, Portland, Oregon. 123 pp.

_____. 1980. Devils Hole Pupfish Recovery Plan. USFWS, Portland, Oregon. 46+ pp.

United States Geological Survey (USGS). 2009. National Atlas Map Maker map layers. http://www-atlas.usgs.gov/maplayers.html. Recovered October 2009.

_____. 2008. Relative abundance and distribution of fishes and crayfish at Ash Meadows, Nye County, Nevada: Annual Report – Draft 2008. Western Fisheries Research Center, Reno Field Station, Reno, Nevada.

_____. 2009. USGS National Earthquake Information Center Earthquake Catalog. Available at: http://neic.usgs.gov/neis/epic/kml/. Accessed in October 2009.

_____. 2005. Selected Groundwater Data for Yucca Mountain Region, Southern Nevada and Eastern California, January-December 2003 *In*: USFWS. 2007b. Ash Meadows gumplant (*Grindelia fraxino-pratensis*) Five Year Review: Summary and Evaluation. 20 pp.

_____. 2002. Trend analysis of groundwater levels and spring discharge in the Yucca Mountain Region, Nevada and California. 1960-2000. Water Resources Investigations Report 02-4178.

University of Nevada, Reno. 2005. Analysis of Socio-Economic Data and Trends for the Comprehensive Economic Development Strategy (CEDS) for White Pine County, Part I. Prepared by Thomas R. Harris and Kurt Jahn.

Valley Electric Association (VEA). 2009. Valley Electric Association Website. Available at: http://www.vea.coop. Accessed March 6, 2010.

Van Devender, T.R., R.C. Averill-Murray, T.C. Esque, P.A. Holm, V.M. Dickinson, C.R. Schwalbe, E.B. Wirt and S.L. Barrett. 2002. Grasses, Mallows, Desert Vine, and More: Diet of the Desert Tortoise in Arizona and Sonora. Pages 160 – 193 *In:* The Sonoran Desert Tortoise: Natural History, Biology, and Conservation, T.R. Van Devender, ed. University of Arizona Press, Tucson.

Walker, G.E. and T.E. Eakin. 1963. Geology and ground water of Amargosa Desert, Nevada. California. USGS Groundwater Resources-Reconnaissance Series Report.

Webb, R.H., L.F Fenstermaker, J.S. Heaton, D.L. Hughson, E.V. McDonald and D.M. Miller. 2009. The Mojave Desert: Ecosystem processes and sustainability revisited *In:* Webb, R.H., L.F Fenstermaker, J.S. Heaton, D.L. Hughson, E.V. McDonald and D.M. Miller (eds.). The Mojave Desert: Ecosystem processes and Sustainability. University of Nevada Press, Reno & Las Vegas, Nevada.

Weissenfluh, D.S., C.R. Baldino, S.D. McKelvey, R.J. Andress, G.G. Scoppettonne and B. Hobbs. 2009. Aquatic invasive species within Ash Meadows National Wildlife Refuge since 2008: Updates, challenges, and goals. Presented at the 2009 Annual Symposium of the Desert Fishes Council, Death Valley, CA.

Wilson, K., M. Bower and D.B. Gaines. 2009. Conceptual influence model guides research, monitoring, and management of the Devils Hole pupfish *Cyprinodon diabolis*. Presented at the 2009 Annual Symposium of the Desert Fishes Council, Death Valley, CA

Winograd, I.J., and Friedman, I., 1972, Deuterium as a tracer of ground-water flow, southern Great Basin, Nevada and California: Geological Society of America Bulletin, v. 83 p. 3691-3708.

Winograd, I.J. and W. Thordarson. 1975. Hydrogeologic and Hydrochemical Framework; South-central Great Basin, Nevada-California, with Special Reference to the Nevada Test Site. USGS Professional Paper 712-C.

CHAPTER 7 - GLOSSARY

ACEC: A BLM designation pertaining to areas where specific management attention is needed to protect and prevent irreparable damage to important historical, cultural, and scenic values, fish or wildlife resources, or other natural systems or processes, or to protect human life and safety from natural hazards

Acre-foot: A unit commonly used for measuring the volume of water; equal to the quantity of water required to cover one acre (43,560 square feet or 4,047 square meters) to a depth of 1 foot (0.30 meter) and equal to 43,560 cubic feet (1,234 cubic meters), or 325,851 gallons.

Action: In the context of the NEPA, describes actions proposed to meet a specific purpose and need and that may have effects on the environment, which are potentially subject to Federal control and responsibility. Federal actions generally fall into the categories of adoption of official policy, formal plans, and programs; or approval of specific projects. For this document, the term action applies to a specific project.

Affected environment: Existing biological, physical, social, and economic conditions of an area subject to change, both directly and indirectly, as the result of a proposed human action.

Air quality: A measure of the health-related and visual characteristics of the air, often derived from quantitative measurements of the concentrations of specific injurious or contaminating substances.

Air Quality Standards: The level of pollutants prescribed by regulation that may not be exceeded during a specified time in a defined area.

Ambient: The surrounding natural conditions (or environment) in a given place and time.

Alluvium: A general term for clay, silt, sand, gravel, or similar consolidated material deposited during comparatively recent geologic time by a stream or other body of running water in the bed of the stream, river, or floodplain, or as a cone or fan at the base of a mountain slope.

Alternative: Any one of a number of options for a project.

Ambient: Of the environment surrounding a body, encompassing on all sides. Most commonly applied to air quality and noise.

American Indian tribe (or tribe): Any American Indian group in the conterminous United States that the Secretary of the Interior recognizes as possessing tribal status (listed periodically in the Federal Register).

Annual (ecology): A plant that completes its development in one year or one season and then dies.

Aquatic: Growing or living in or near the water.

Aquifer: A water-bearing rock unit (unconsolidated or bedrock) that will yield water in a usable quantity to a well or spring.

Archaeological site: A discrete location that provides physical evidence of past human use.

Archaeology: The scientific study of the life and culture of past, especially ancient, peoples, as by excavation of ancient cities, relics, artifacts, etc.

Area of Critical Environmental Concern (ACEC): A Bureau of Land Management (BLM) designation pertaining to areas where specific management attention is needed to protect and prevent irreparable damage to important historical, cultural, and scenic values, fish or wildlife resources, or other natural systems or processes, or to protect human life and safety from natural hazards.

Artifact: Any object showing human workmanship or modification, especially from a prehistoric or historic culture.

Assessment: The act of evaluating and interpreting data and information for a defined purpose.

A-Weighted Sound Levels: Decibels (referenced to 20 micro-Pascals) as measured with an A-weighting network of a standard sound level meter, abbreviated dB(A).

Backfill: The fill, often mine waste or rock, that replaces the void left from where a rock or ore has been removed. Also, the material used to fill in a trench in the groundbed (i.e., pipeline trench). The composition of the backfill varies based on the soil type being used and the component being covered.

Background (visual): That portion of the visual landscape lying from the outer limit of the middleground to infinity. Color and texture are subdued in this area, and visual sensitivity analysis here is primarily concerned with the two-dimensional shape of landforms against the sky.

Baseline: The existing conditions against which impacts of the proposed action and its alternatives can be compared.

Basin: A depressed area having no surface outlet (topographic basin); a physiographic feature or subsurface structure that is capable of collecting, storing, or discharging water by reason of its shape and the characteristics of its confining material (water); a depression in the earth's surface, the lowest part often filled by a lake or pond (lake basin); a part of a river or canal widened (drainage, river, stream basin).

Best management practices: A suite of techniques that guide, or may be applied to, management actions to aid in achieving desired outcomes and help to protect the environmental resources by avoiding or minimizing impacts of an action.

Big game: Large species of wildlife that are hunted (such as elk, deer, pronghorn antelope).

Biological assessment: Information prepared by, or under the direction of, a Federal agency to determine whether a proposed action is likely to (1) adversely affect listed species or designated critical habitat; (2) jeopardize the continued existence of species that are proposed for listing; or (3) adversely modify proposed critical habitat.

Biological opinion: A document that is the product of formal consultation, stating the opinion of the U.S. Fish and Wildlife Service on whether or not a Federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

Butte: A steep hill standing alone in a plain.

Candidate species: A plant or animal species not yet officially listed as threatened or endangered, but which is undergoing status review by the U.S. Fish and Wildlife Service.

Clean Air Act of 1990: Federal legislation governing air pollution. The Clean Air Act established NAAQS for CO, NO_x, O_3, PM, SO_2, and Pb. PSD classifications define the allowable increased levels of air quality deterioration above legally established levels and include the following:

Class I – minimal additional deterioration in air quality (certain national parks and wilderness areas)

Class II – moderate additional deterioration in air quality (most lands)

Class III – greater deterioration for planned maximum growth (industrial areas)

Clean Water Act of 1987: National environmental law enforced by the U.S. EPA that regulates water pollution.

Cooperating Agency: Assists the lead Federal agency in developing an environmental assessment or EIS. The CEQ regulations implementing NEPA define a cooperating agency as any agency that has jurisdiction by law or special expertise for proposals covered by NEPA (40 CFR 1501.6). Any Federal, state, or local government jurisdiction with such qualification may become a cooperating agency by agreement with the lead agency.

Council on Environmental Quality: An advisory council to the President established by the NEPA. It reviews Federal programs for their effort on environmental studies, and advises the President on environmental matters.

Criteria: Standards on which a judgment or decision can be based.

Cultural resources: Remains of human activity, occupation, or endeavor as reflected in districts, sites, buildings, objects, artifacts, ruins, works of art, architecture, and natural features important in human events.

Cumulative effect (or impact): The impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable

actions. Cumulative impacts are evaluated as part of the EIS, and may include consideration of additive or interactive effects regardless of what agency or person undertakes the other actions.

Daytime: The period from 7:00 a.m. to 10:00 p.m.

Decibel: A unit for expressing the relative intensity of sounds on a logarithmic scale from zero for the average least perceptible sound to about 130 for the average level at which sound causes pain to humans. For traffic and industrial noise measurements, the dBA, a frequency-weighted noise unit, is widely used. The dBA scale corresponds approximately to the frequency response of the human ear and thus correlates well with loudness.

Degradation: The wearing down or away, and general lowering or reducing, of the earth's surface by the processes of weathering and erosion.

Discharge: Outflow of surface water in a stream or canal (water). Discharge from an industrial facility that may contain pollutants harmful to fish or animals if it is released into nearby water bodies usually requires a permit issued by the U.S. EPA and is monitored.

Distance zone: A visibility threshold distance where visual perception changes. They usually are defined as foreground, middleground, and background.

Diversion: A channel, embankment, or other manmade structure constructed to divert water from one area to another; the process of using these structures to move water.

Drainage: The natural or artificial removal of surface water and groundwater from a given area. Many agricultural soils need drainage to improve production or to manage water supplies.

Drawdown: The decrease in elevation of the water surface in a well, the local water table or the pressure head on an artesian well due to extraction of groundwater or decrease in recharge to the aquifer.

Easement: A right afforded a person, agency, or organization to make limited use of another's real property for access or other purposes.

Ecology: The relationship between living organisms and their environment.

Effect (or impact): A modification of the existing environment as it presently exists, caused by an action (such as construction or operation of facilities). An effect may be direct, indirect, or cumulative. The terms effect and impact are synonymous under the NEPA. A direct effect is caused by an action and occurs at the same time and same place (40 CFR 1508.8(a)). An indirect effect is caused by the action later in time or farther removed in distance, but still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Emission: Effluent discharged into the atmosphere, usually specified by mass per unit time, and considered when analyzing air quality.

Endangered species: A plant or animal that is in danger of extinction throughout all or a significant portion of its range. Endangered species are rarely identified by the Secretary of the Interior in accordance with the ESA of 1973.

Endangered Species Act of 1973: Provides a means whereby the ecosystems upon which threatened and endangered species depend may be conserved and to provide a program for the conservation of such threatened and endangered species. The ESA requires all Federal agencies to seek to conserve threatened and endangered species, use applicable authorities in furtherance of the purposes of the ESA, and avoid jeopardizing the continued existence of any species that is listed or proposed for listing as threatened and endangered or destroying or adversely modifying its designated or proposed critical habitat. The U.S. Fish and Wildlife Service is responsible for administration of this act.

Energy conservation: A means of saving energy.

Environment: The surrounding conditions, influences, or forces that affect or modify an organism or an ecological community and ultimately determine its form and survival.

Environmental Impact Statement: A document prepared to analyze the impacts on the environment of a proposed action and released to the public for review and comment. An EIS must meet the requirements of NEPA, CEQ, and the directives of the agency responsible for the proposed action.

Environmental justice: The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and tribal programs and policies (see EO 12898).

Ephemeral wash or stream: A stream that flows only in direct response to precipitation in the immediate watershed or in response to the melting of a cover of snow and ice and has a channel bottom that is always above the local water table.

Erosion: The wearing away of the land surface by running water, wind, ice, or other geologic agents and by such processes as "gravitation creep."

Federal Register: Published by the Office of the Federal Register, National Archives and Records Administration, the Federal Register is the official daily publication for rules, proposed rules, and notices of Federal agencies and organizations, as well as EOs and other presidential documents.

Floodplain: That portion of a river or stream valley, adjacent to a river channel, that is built of sediments and is inundated with water when the stream overflows its banks.

Foreground: The visible area from a viewpoint or use area out to a distance of 0.5 mile. The ability to perceive detail in a landscape is greatest in this zone.

Fossil: Any remains, trace, or imprint of a plant or animal that has been preserved by natural process in the earth's crust since some past geologic time.

Geographic information system: A system of computer hardware, software, data, people and applications that capture, store, edit, analyze, and graphically display a potentially wide array of geospatial information.

Geology: The science that relates to the earth, the rocks of which it is composed, and the changes that the earth has undergone or is undergoing.

Geothermal resource: Heat found in rocks and fluids at various depths that can be extracted by drilling or pumping for use as an energy source. This heat may be residual heat, friction heat, or a result of radioactive decay.

Global warming: An increase in the average temperature of the earth's atmosphere and oceans. The term also is used to describe the theory that increasing temperatures are the result of a strengthening greenhouse effect caused primarily by manmade increases in CO_2 and other greenhouse gases.

Groundwater: Subsurface water that fills available openings in rock or soil materials to the extent that they are considered water saturated.

Habitat: A specific set of physical conditions in a geographic area(s) that surrounds a single species, group of species, or large community. In wildlife management, the major components of habitat are food, water, cover, and living space.

Hydrology: The study of the movement, distribution, and quality of water throughout the earth, addresses both the hydrologic cycle and water resources.

Impact (or effect): A modification of the existing environment as it presently exists, caused by an action (such as construction or operation of facilities). An impact may be direct, indirect, or cumulative. The terms effect and impact are synonymous under NEPA.

Indirect effect (or impact): Secondary effects that occur in locations other than the initial action or later in time, but that are caused by the proposed action.

Industrial area: A land use zoning term used to describe or designate areas in which heavy industry is concentrated or allowed.

Infrastructure: The facilities, services, and equipment needed for a community or facility to function, such as and including roads, sewers, water lines, and electric lines.

Intermittent: A river or stream that flows for a period of time, usually seasonally during rainy periods, and stops during dry periods. In arid regions, dry periods may be interrupted by occasional flash floods from brief but intense rain storms.

Invasive species: Describes a large number of nonnative plant species whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

Issue: Describes the relationship between actions (proposed, connected, cumulative, similar) and environmental (natural, cultural, and socioeconomic) resources. Issues may be questions, concerns, problems, or other relationships, including beneficial ones. Issues do not predict the degree or intensity of harm the action might cause, but simply alert the reader as to what the environmental problems might be. The NEPA document should address issues identified through interaction with agencies and/or the public, and/or through resource studies.

Labor force: All persons 16 years of age or over who are either employed or unemployed and actively looking for a job.

Land use plan: A plan or document developed by a government entity, which outlines specific functions, uses, or management-related activities of an area, and may be identified in combination when joint or seasonal uses occur and may include land used for support facilities that are an integral part of the use.

Landform: A term used to describe the many land surfaces that exist as a result of geologic activity and weathering (e.g., plateaus, mountains, plains, and valleys).

Landscape: An area composed of interacting ecosystems that are repeated because of geology, landform, soils, climate, biota, and human influences throughout the area. Landscapes are generally of a size, shape, and pattern, which are determined by interacting ecosystems.

Ldn: Day/Night Sound Level: A 24-hour average, where sound levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dB weighting, but no added weighting on the evening hours, abbreviated as DNL or L_{DN}.

Lease: An authorization or contract by which one party (lessor) conveys the use of property to another (lessee) in return for rental payments. In cases of resource production, lessees pay royalties to the lessor in addition to rental payments.

L_{EQ}: The equivalent sound level, or the time-integrated continuous sound level, that represents the same sound energy as the varying sound levels, over a specified monitoring period.

Megawatt: A unit for measuring power equal to one million watts. The productive capacity of electrical generators is measured in MW.

Mesa: An isolated, nearly level land mass, formed on nearly horizontal rocks, standing above the surrounding country and bounded with steep sides.

Mineral resources: Any inorganic or organic substance occurring naturally in the earth that has a consistent and distinctive set of physical properties. Examples of mineral resources include coal, nickel, gold, silver, and copper.

Minimal (impact): Unless otherwise specified, "minimal" shall mean non-deleterious impacts that are measurable on the short term, but not significant (see definition herein).

Mitigation: The abatement or reduction of an impact on the environment by (1) avoiding a certain action or parts of an action, (2) employing certain construction measures to limit the

degree of impact, (3) restoring an area to preconstruction conditions, (4) preserving or maintaining an area throughout the life of a project, (5) replacing or providing substitute resources to the environment, or (6) gathering data (e.g., archaeological or paleontological) prior to disturbance.

Multi-Use: Land use where a combination of use types can be found in close proximity together: commercial, residential, public, industrial, etc.

National Ambient Air Quality Standards: The allowable concentrations of air pollutants in the air specified by the Federal government. The air quality standards are divided into primary standards (based on the air quality criteria and allowing an adequate margin of safety and requisite to protect the public health) and secondary standards (based on the air quality criteria and allowing an adequate margin of safety and requisite to protect the public welfare) from any unknown or expected adverse effects of air pollutants.

National Environmental Policy Act of 1969: Our nation's basic charter for protection of the environment. It establishes policy, sets goals, and provides means for carrying out the policy. In accordance with NEPA, all Federal agencies must prepare a written statement on the environmental impacts of a proposed action. The provisions to ensure that Federal agencies act according to the letter and spirit of NEPA are in the CEQ regulations for implementing NEPA (43 CFR 1500-1508).

National Register of Historic Places: A listing, maintained by the Secretary of the Interior, of districts, sites, buildings, structures, and objects worthy of preservation. To be eligible a property must normally be at least 50 years old, unless it has exceptional significance, and have national, State, or local significance in American history, architecture, archaeology, engineering, or culture; and possess integrity of location, design, setting, material, workmanship, feeling, and association; and (a) be associated with events that have made a significant contribution to the broad patterns of history, (b) be associated with the lives of persons significant in our past, or (c) embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic values; or represent a significant and distinguishable entity whose components may lack individual distinction; or (d) have yielded, or may be likely to yield, information important to prehistory or history.

Negligible (impact): Unless otherwise specified, "negligible" shall mean impacts of such a small scale such as to be non-measurable.

Nighttime: Periods other than daytime (as defined above), including legal holidays.

Noise: Loud, unpleasant, unexpected, or undesired sound that disrupts or interferes with normal human a

Noise Emission: The industry standard format of sound power level, which is the total acoustic power radiated from a given sound source as relates to a reference power level of 10 picowatts. Sound power level differs from sound pressure level, which quantifies the fluctuations in air pressure caused by acoustic energy.

Noise Level Measurements: Unless otherwise indicated, the use of A-weighted and "slow" response of a noise monitoring instrument complying with at least Type 2 requirements as defined by the latest revision of American National Standard Institute S1.4 Specification for Sound Level Meters.

Nonattainment area: An air quality control region (or portion thereof) in which the U.S. EPA has determined that ambient air concentrations exceed NAAQS for one or more criteria pollutants.

Noxious weed: Nonnative plant species that negatively impact crops, native plant communities, and/or management of natural or agricultural systems. Noxious weeds are officially designated by a number of states (including Nevada) and Federal agencies.

Particulates: Minute, separate particles, such as dust or other air pollutants.

Perennial stream: A stream or that part of a stream that flows continuously during all of the calendar year as a result of groundwater discharge or surface runoff.

Perennial yield: The amount of usable water from a groundwater aquifer that can be withdrawn economically and consumed each year for an indefinite period of time. It cannot exceed the natural recharge to that aquifer and ultimately is limited to maximum amount of discharge that can be used for beneficial use.

Pipeline: A continuous pipe conduit for transporting fluids such as natural gas and/or supplemental gaseous fuels, oil, or water from one point to another, usually from a point in or beyond the producing field or processing plant to another pipeline or to points of use.

Playa: The shallow central lake basin of a desert plain, in which water gathers after a rain and is evaporated.

Prime farmland: A special category of highly productive cropland that is recognized and described by the U.S. Department of Agriculture's Soil Conservation Service and receives special protection under the Surface Mining Law of 1977.

Project area: Footprint of the project.

Public land: Land or interest in land owned by the United States and administered through the Secretary of the Interior through the BLM without regard to how the United States acquired ownership, except lands on the Outer Continental Shelf, and land held in trust for the benefit of American Indians, Aleuts, and Eskimos.

Range: A large, open area of land over which livestock can wander and graze.

Raptor: A bird of prey.

Rare: A plant or animal restricted in distribution. May be locally abundant in a limited area or few in number over a wide area.

Recharge: Replenishment of a groundwater reservoir (aquifer) by the addition of water, through either natural or artificial means.

Reclamation: Restoration of land disturbed by natural or human activity (e.g., mining, pipeline construction) to original contour, use, or condition. Also describes the return of land to alternative uses that may, under certain circumstances, be different from those prior to disturbance.

Recontouring: Return a surface to or near to its original form through some type of action such as grading.

Record of Decision: A document separate from, but associated with, an EIS that publicly and officially discloses the responsible official's decision on a proposed action.

Region of Influence: Area which is impacted by activities related to the project. Varies by species and activity, however, for this project it has been defined as the hydrographic unit.

Reservation: Land set aside to achieve a particular land use or conservation objective. For the purposes of this document, reservation refers to those lands managed by an American Indian tribe under the U.S. Department of the Interior's Bureau of Indian Affairs. The reservation land is Federal territory held in trust for tribes. The American Indian tribes have limited national sovereignty.

Revegetation: The reestablishment and development of self-sustaining plant cover. On disturbed sites, this normally requires human assistance such as reseeding.

Reverse osmosis: A separation process that uses pressure to force a solvent through a membrane that retains the solute on one side and allows the pure solvent to pass to the other side. More formally, it is the process of forcing a solvent from a region of high solute concentration through a membrane to a region of low solute concentration by applying a pressure in excess of the osmotic pressure.

Revised Statute 2477: the right of way for the construction of highways across public lands not otherwise reserved for public purposes." That right-of-way is a legitimate property right (most often of the counties and states), and, consequently, carries with it a bundle of associated rights, including the right to maintain the roads and upgrade them under certain circumstances. Roads can be federally designated 'RS 2477'.

Right-of-way: Land authorized to be used or occupied for the construction, operation, maintenance, and termination of a project, such as a road or utility.

Riparian: Referring or relating to areas adjacent to water or influenced by free water associated with streams or rivers on geologic surfaces occupying the lowest position of a watershed. Pertaining to, living or situated on banks of rivers, streams, or other body or water. Normally used to refer to the plants of all types that grow along, around, or in wet areas.

Rural: Sparsely settled places away from the influence of large cities and towns. Such areas are distinct from more intensively settled urban and suburban areas, and also from unsettled lands

such as outback or wilderness. People tend to live in villages, on farms, and in other isolated houses on large plots of land.

Scoping: The process open to the public early in the preparation of an EIS for determining the scope of issues related to a proposed action and identifying significant issues to be addressed in an EIS.

Screen: An initial assessment performed with few data and many assumptions to identify alternatives that should be evaluated more carefully.

Sediment: Solid fragmental material, either mineral or organic, that is transported or deposited by air, water, gravity, or ice.

Sedimentation: The result when soil or mineral is transported by moving water, wind, gravity, or glaciers and deposited in streams or other bodies of water, or on land. Also, letting solids settle out of wastewater by gravity during treatment.

Sensitive receptor: In terms of noise, people or animals that may hear a noise or be sensitive to increased noise levels within their range of hearing.

Sensitive Receptor Location: A location of regulatory compliance where particular sensitivities to noise exist, such as residential areas, institutions, hospitals, parks, or other environmentally sensitive areas.

Sound Pressure Level (SPL): The observable effect of acoustic energy radiation, quantifying the sound level as perceivable by the receiver. When Sound Pressure is used to describe a noise source, the distance between source and receiver must be known in order to yield useful information about the power rating of the source.

Sensitivity: The state of being readily affected by the actions of external influence.

Significant (impact): Unless otherwise specified, "significant" has been used in this document to describe any impact that would cause an impact that is irreversible and/or irretrievable without human intervention (i.e., mitigation/restoration)

Special Development Area: sets aside public or private areas of special interest that would be subject to a specific POD or a Development Agreement in accordance with Nye County Code Title 16.32. SDA is a mixed-use designation and a variety of land uses might be proposed for approval, such as the Yucca Mountain Project Gateway Area Concept Plan, and projects under review by the Bureau of Land Management, such as the Solar Energy Facilities. A property owner/developer must provide a specific POD for the subject property and obtain recommendations from the Planning Committee and the Town Advisory Board prior to Nye County Commission approval.

Special status species: Wildlife and plant species either federally listed or proposed for listing as endangered or threatened; state-listed; or priority species of concern to Federal agencies or tribes.

Sound power Level (PWL): A specialized analytical metric used to fully quantify the acoustic energy emitted by a source which is considered a complete value without the accompanying information on the position of measurement relative to the source. It may be used to calculate the sound pressure level at any desired distance away from the source.

Surface water: All bodies of water on the surface of the earth and open to the atmosphere such as rivers, lakes, reservoirs, ponds, seas, and estuaries.

Surfactant: Any substance that when dissolved in water or an aqueous solution reduces its surface tension or the interfacial tension between it and another liquid.

Terrain: Used to describe the geophysiographic characteristics of land in terms of elevation, slope, and orientation.

Threatened or Endangered Species: Animal or plant species that are listed under the Federal ESA of 1973, as amended (federally listed), or under similar state laws (state-listed).

Total dissolved solids: A term that describes the quantity of dissolved material in a sample of water.

Traditional cultural places: These named places (landscape features) comprise the cultural landscape that provides the context for evaluating specific traditional cultural properties.

Transition zone: The area between two discrete environmental areas, and thus containing elements of each. For example, the transition zone between an upland piñon forest and a lowland desert scrub environment.

Transmissivity: The rate at which water is transmitted through a unit width of the aquifer under a unit hydraulic gradient.

Tribe: Any Indian tribe, band, group, or community having a governing body recognized by the Secretary of Interior.

Undertaking: A project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; those requiring a Federal permit, license, or approval; and those subject to State or local regulation administered pursuant to a delegation or approval of a Federal agency.

Urban: An area where there is an increased density of human-created structures in comparison to the areas surrounding it. Urban areas are frequently referred to as cities or towns. The U.S. Census Bureau defines an urbanized area as: "Core census block groups or blocks that have a population density of at least 1,000 people per square mile and (386 per square kilometer) and surrounding census blocks that have an overall density of at least 500 people per square mile (193 per square kilometer)."

Vegetation communities: Species of plants that commonly live together in the same region or ecotone.

Visibility: The distance to which an observer can distinguish objects from their background. The determinants of visibility include the characteristics of the target object (shape, size, color, pattern), the angle and intensity of sunlight, the observer's eyesight, and any screening present between the viewer and the object (i.e., vegetation, landform, even pollution such as regional haze).

Visual resource management classes: Categories assigned to public lands based on scenic quality, sensitivity level, and distance zones. There are four classes, each of which has an objective that prescribes the amount of change allowed in the characteristic landscape.

Waters of the United States: All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce including adjacent wetlands and tributaries to water of the United States; and all waters by which the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce.

Watershed: All land and water within the confines of a drainage divide.

Well field: Area containing one or more wells that produce usable amounts of water or oil.

Wetlands: Areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Examples of wetlands include marshes, shallow swamps, lakeshores, bogs, muskegs, wet meadows, estuaries, and riparian areas.

Wilderness: An area formally designated by Congress as part of the National Wilderness Preservation System.

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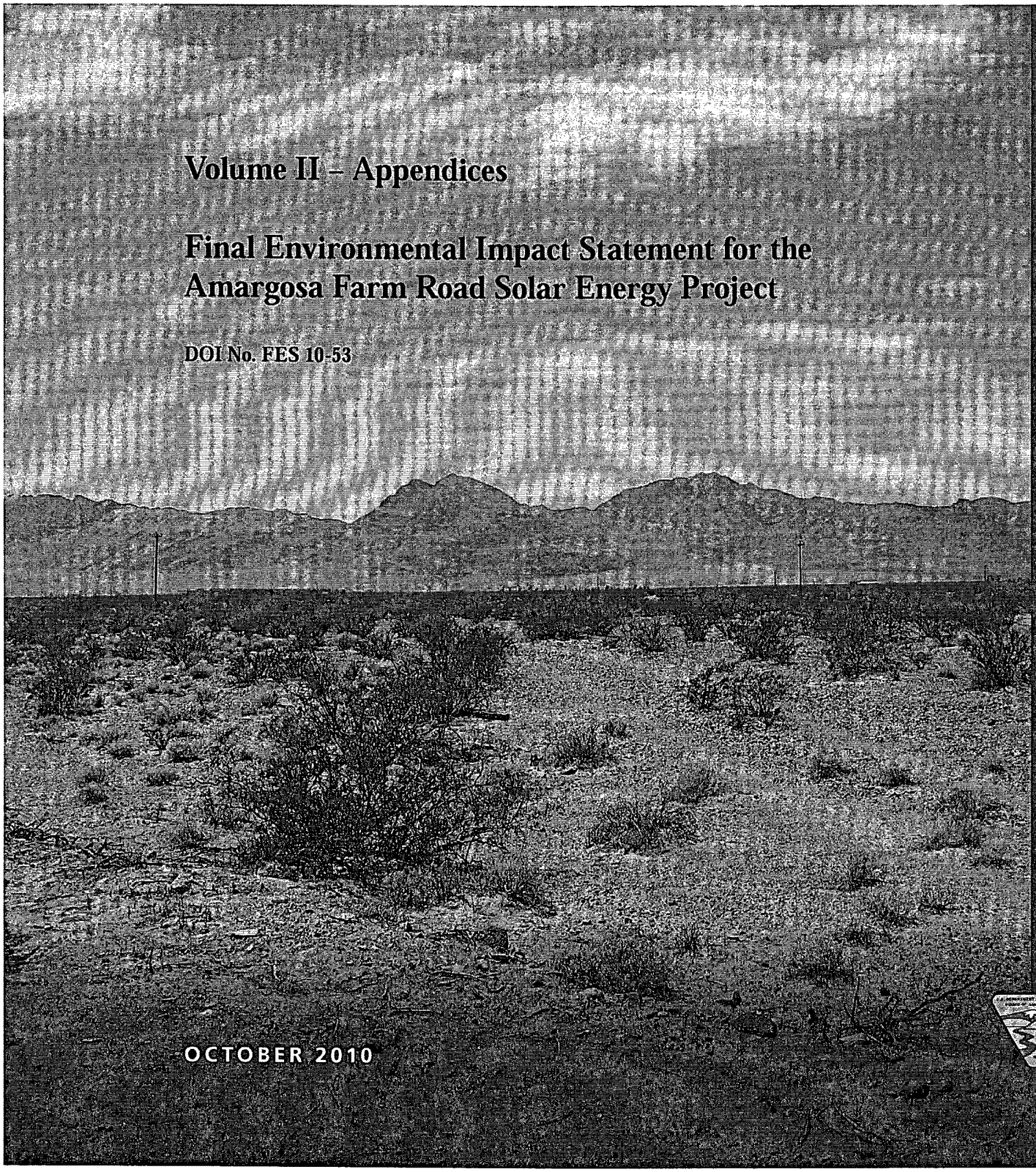

Volume II – Appendices

Final Environmental Impact Statement for the Amargosa Farm Road Solar Energy Project

DOI No. FES 10-53

OCTOBER 2010

BLM

Pahrump Field Office

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Appendix A

Proposed Avoidance, Minimization, and Mitigation Measures

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APPENDIX A – PROPOSED AVOIDANCE, MINIMIZATION AND MITIGATION MEASURES

A.1 Air Quality

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
AQ-1	Solar Millennium and/or the construction contractor will prepare an Air Quality Construction Mitigation Plan, for BLM's approval, which details the steps that will be taken and the reporting requirements necessary to ensure compliance with air quality mitigation measures. Project activities would be in compliance with applicable federal, state, and local laws and regulations concerning prevention and control of air pollution during construction and operation.	X	X
AQ-2	Project personnel would be required to implement measures to minimize fugitive dust emissions from construction activities. To accomplish this, the following measures would be implemented. • All unpaved roads and disturbed areas in the Project footprint and linear construction sites will be watered as frequently as necessary to comply with the dust mitigation objectives. The frequency of watering can be reduced or eliminated during periods of precipitation. • No vehicle will exceed the approved speed limit within the construction site. • Visible speed limit signs will be posted at the construction site entrances. • All unpaved exits from the construction site will have gravel or an approved treatment to prevent trackout to public roadways. • All construction vehicles will enter the construction site through the approved treated entrance roadways, unless an alternative route has been submitted to and approved by the BLM. • Construction areas adjacent to any paved roadway will be provided with sandbags or other measures as specified in the Construction Storm Water Pollution Prevention Plan to prevent run-off to roadways. • All paved roads within the construction site will be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris. • All soil storage piles and disturbed areas that remain inactive for longer than 10 days will be covered or will be treated with an approved dust suppressant compound.	X	

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
	• All vehicles that are used to transport solid bulk material on public roadways and that have potential to cause visible emissions will be provided with a cover or the materials will be sufficiently wetted and loaded onto the trucks in a manner to provide at least one foot of freeboard. • Wind erosion control techniques (such as windbreaks, water, approved chemical dust suppressants, and/or vegetation) will be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition will remain in place until the soil is stabilized or permanently covered with vegetation.		
AQ-3	The project owner will use gasoline powered light trucks for facility maintenance, except for mirror washing, welding rigs, or other specific activities which requires a larger vehicle.		X
AQ-4	The project owner will provide a site operations dust control plan that: • Describes the wind erosion control techniques such as windbreaks, water, and approved chemical dust suppressants that will be used on areas that could be disturbed by vehicles or wind; and • Identifies the location of signs throughout the facility that will limit traveling on unpaved portion of roadways to solar equipment maintenance vehicles only.		X
AQ-5	Traffic on the project site will be restricted to designated roadways within the site to minimize the disturbance of soil unrelated to actual construction of heliostats within the project.		X
AQ-6	Designated roadways that could be disturbed by vehicles or wind will be treated with an approved dust suppressant during both construction and operation. The approved suppressant will be one that has been applied previously on properties owned by the BLM, and that has been previously reviewed and approved by the Army Corps of Engineers as an acceptable dust palliative.		X
AQ-7	Areas within the project designated for construction of solar troughs or other project related equipment that could be disturbed by wind will be treated with an approved chemical dust suppressant during both construction and operation. The approved suppressant will be one that has been applied previously on properties owned by the BLM, and that has been previously reviewed and approved by the Army Corps of Engineers as an acceptable dust palliative. The ongoing application of approved suppressants during the long-term operation of the project will be made based upon determination of a need for additional coverage from time to time.		X

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance

A.2 Geological Hazards and Mineral Resources

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
GEO-1	National Electrical Safety Code - Will provide guidance for mitigation of geological hazards by increasing the project's ability to withstand geological hazards such as earthquakes.	X	

A.3 Soils

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
SOIL-1	Onsite drainage system - The project will construct diversion channels, berms, and a drainage channel system to prevent onsite and offsite, downstream damage from water erosion. A site-specific, stormwater drainage plan will be prepared and adhered to during project construction and operation. The Plan of Development describes lined-drainage channels that will be installed within the solar fields. Areas between channels will be sloped toward the channels. Lined channels will reduce the potential for water erosion of natural soils that will remain within the solar fields.	X	X
SOIL-2	Sediment Barriers - Man made sediment barriers such as hay bales or sand bags will be used to reduce soil/sediment loss from within the Project area.	X	
SOIL-3	Dust Reduction - Dust-control measures would be put in place to reduce the hazard of wind-blown dust within the Project Area. Active construction areas will be watered as an effective measure to reduce the escape of wind-blown dust from the site.	X	
SOIL-4	Coverage of Soil Stockpiles - Soil stockpiles that have been removed from the construction area will be covered to reduce runoff caused by precipitation and fugitive wind-blown dust.	X	

A.4 Water Resources

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
WTR-1	Prior to beginning any clearing, grading or excavation activities associated with construction of the project, the project owner will develop and implement an approved construction-phase SWPPP as required under the General Storm Water Construction Activity Permit, as well as implement any other project-specific mitigation measures required by other agencies (e.g. NDEP, Nye County, USACE).	X	
WTR-2	The project owner will obtain and comply with permits for construction of project specific water pipelines or septic system prior to construction of the plant.	X	
WTR-3	The project owner will apply for the appropriate water right permits for a change in place of use, manner of use and point of diversion (for water purchase option), as required, with the Nevada Division of Water Resources.	X	
WTR-4	Prior to commercial operation, the project owner, as required under the General Industrial Activity Storm Water Permit, will develop and implement an operations phase SWPPP.		X
WTR-5	The Proponent shall meter all wells for construction and operation of the proposed project and meter wells for the additional acquired water rights to ensure that groundwater pumping is not impacting the local water table. Furthermore, quarterly reports will be filed with the Nevada Division of Water Resources and with the BLM.		X
WTR-6	The Proponent will adopt and comply with the Water Minimization stipulations agreed to by the Proponent, NPS, USFWS, BLM, and Nye County. The stipulation is provided at the end of Appendix A.	X	X

A.5 Noise

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
NOISE-1	Personnel would be required to comply with applicable federal, state, and local laws and regulations concerning prevention and control of noise during project construction.	X	

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
NOISE-2	Equipment and trucks used for project construction would utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds, wherever feasible).	X	
NOISE-3	Stationary noise sources would be located as far from adjacent receptors as possible and would be muffled and enclosed within temporary sheds, incorporate insulation barriers or other measures to the extent feasible.	X	X
NOISE-4	At least 15 days prior to the start of ground disturbance, the project owner shall notify all residents within 1 mile of the site of the start of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with construction or operation.	X	
NOISE-5	The project owner shall investigate, evaluate and attempt to resolve all project-related noise complaints. If necessary, the project owner shall take all feasible measures to reduce the noise at its source.	X	X
NOISE-6	If the noise cannot be reduced at its source, the project owner will investigate feasible means of reducing noise levels at the nearby residence filing the complaint and take appropriate measures to resolve the issue.	X	X

A.6 Biological Resources

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
	Vegetation		
VEG-1	All construction vehicle movement outside the ROW would be restricted to pre-designated access, contractor access, or public roads.	X	X
VEG-2	The aerial limits of construction activities would be pre-determined, with activity restricted to and confined within those limits.	X	
VEG-3	Prior to construction, all supervisory construction personnel would be instructed on the protection of vegetation, including (1) federal and state laws regarding plants, including collection and removal; (2) the importance of this resource and the purpose and necessity of protecting them.	X	

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
VEG-4	Preconstruction surveys for plants designated as sensitive or of concern will be conducted in areas of known occurrence of habitat, including noxious weeds surveys as stipulated by the land-administering agency during the development of the Plan of Development (POD), once the facilities boundaries have been located and staked.	X	
VEG-5	Prior to construction, a Noxious Weed Management Plan will be developed in accordance with BLM standards. Included in the noxious weed plan will be stipulations regarding construction, restoration, and operation (e.g. use of weed-free materials, washing of equipment, etc.).	X	X
VEG-6	Pre-construction surveys conducted to identify the locations of plants protected by the State of Nevada (NRS 527.60-120) will be flagged and avoided until BLM authorizes a proper salvage protocol.	X	
VEG-7	Vegetation salvage and replanting will be implemented and completed as required by the BLM in accordance with their established guidelines. Adopting roadway signage that discourages off-road travel will help protect vegetation along the road margins.	X	
VEG-8	The area limits of project construction and survey activities would be predetermined based on the temporary and permanent disturbance areas noted on the final design engineering drawings to minimize environmental effects arising from the project, with activity restricted to and confined within those limits.	X	
	Birds		
WL-1	Prior to the initiation of construction activities, all construction personnel will be instructed on the protection of migratory birds. To assist in this effort, the training will address the MBTA and all applicable state laws, field procedures, and prohibited activities.	X	
WL-2	Prior to any ground-disturbing construction activity, a qualified biologist will survey and inspect the potentially affected area(s) for nests or breeding birds. If a breeding pair is discovered within the construction footprint, BLM protocol for species protection would be implemented.	X	
WL-3	Qualified biologists will survey all areas to be disturbed during construction for Burrowing owl-nesting cavities prior to the nesting season and during construction if ground-disturbing activities occur between mid-march and August. Empty nest-site burrows will be collapsed within construction zone to mitigate direct impacts that may otherwise occur to the owl.	X	

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
WL-4	Burrowing owls and their burrows are protected at construction sites in accordance with USFWS-Las Vegas Office guidance. If owl-occupied burrows are located during the nesting or brooding season, burrows will be avoided following USFWS protocols until the young owls leave the nest or it is determined that the nesting attempt failed.	X	
WL-5	To minimize perching opportunities for raptors near habitats supporting sensitive prey species, structures incorporating a design to discourage raptor perching should be selected including Avian Power Line Interaction Committee (APLIC) guidelines for avoiding unintended injuries to birds.	X	
	Reptiles		
WL-6	Surveys for Desert Tortoise will occur prior to construction activities in accordance with applicable Federal and State regulations and laws.	X	
WL-7	Prior to the initiation of construction activities, all construction personnel will be instructed on the protection of the Desert Tortoise. The training will address: life history, listing status, applicable state and federal laws, field procedures, and prohibited activities.	X	
WL-8	All movement of construction vehicles outside of the right-of-way will be restricted to pre-designated access, contractor-acquired access, or public roads.	X	
WL-9	All construction sites and access roads shall be clearly marked or flagged at the outer limits prior to the onset of any surface-disturbing activity. All personnel shall be informed that their activities must be confined within the marked or flagged areas.	X	
WL-10	Any excavated holes (i.e., foundations) left open overnight will be covered, and/or tortoise-proof fencing will be installed to prevent the possibility of tortoises falling into them.	X	
WL-11	Construction sites and access roads shall be surveyed by qualified tortoise biologists no more than 15 days prior to the initiation of construction. Surveys shall provide 100 percent coverage of the construction area.	X	
WL-12	During periods of high tortoise activity (March through October) a tortoise biologist shall be present to monitor construction activities in areas not previously cleared or stabilized.	X	
WL-13	Dust control practices, specifically the use of water, will be monitored to ensure that pooling of water does not occur.	X	

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
WL-14	Personnel on the right-of-way, within Desert Tortoise habitat, will be required to check under their vehicles prior to moving them.	X	
WL-15	Pets will not be allowed on the transmission line right-of-way during construction.	X	
WL-16	All Desert Tortoise burrows located will be flagged or marked.	X	
WL-17	All Desert Tortoise burrows, and other species' burrows that may be used by Desert Tortoises, will be examined to determine the occupancy of each burrow by tortoises.	X	
WL-18	Any Desert Tortoise removed from construction sites shall be placed in an unoccupied burrow similar to the one in which it was found or in an artificial burrow, following the protocol approved by the BLM and USFWS and in compliance with NRS 503.597 and NAC 503.093.	X	
WL-19	Desert Tortoise eggs found within construction sites will be removed by qualified tortoise biologists, in accordance with BLM and USFWS protocols.	X	
WL-20	USFWS will be notified, within three days, of any tortoise death or injury caused by project activities. Notification will include the date, time, circumstances, and location.	X	
WL-21	Dead tortoises will be marked and left on-site.	X	
WL-22	Injured tortoises will be transported to a qualified veterinarian and the USFWS will determine their disposition.	X	
WL-23	Concurrent with the Desert Tortoise clearance surveys, a biologist will conduct a preconstruction survey for Gila Monsters in the project area.	X	
WL-24	NDOW's encounter protocols, *Gila Monster Status, Identification and Reporting Protocol for Observations* should be incorporated into the site plan of development (POD) and forwarded to the principal contractors and site managers for awareness during construction and operation.	X	X
	General Wildlife and Wildlife Habitat		
WL-25	Clearing will be restricted to that area needed for construction.	X	
WL-26	Construction right-of-way will be limited to the minimum practicable width.	X	

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
WL-27	Littering is not allowed. Project personnel will not leave food or waste in the project area, and no biodegradable or non-biodegradable debris will remain in the right-of-way following completion of construction.	X	X
WL-28	No wildlife may be harmed except to protect life and limb.	X	X
WL-29	Project personnel are not allowed to bring pets to the project area in order to minimize harassment or killing of wildlife and to prevent the introduction of destructive animal diseases to native wildlife populations.	X	X
WL-30	Wildlife species may not be collected for pets or any other reason.	X	X
WL-31	Project supplies or equipment where wildlife could hide will be inspected prior to moving or working on them, to reduce the potential for injury to wildlife. Supplies and equipment that cannot be inspected or from which wildlife cannot escape or be removed, will be covered or otherwise made secure from wildlife intrusion or entrapment at the end of each work day.	X	
WL-32	All steep-walled trenches, construction holes, or excavations used during construction will be inspected twice daily (early morning and evening) to protect against wildlife entrapment.	X	
WL-33	An approved speed limit will be enforced on project right-of-way and access roads, unless otherwise posted, for all project personnel.	X	
WL-34	Evaporation ponds will be fenced on the perimeter and the top screened to prevent unsuitable and possibly fatal use by wildlife.		X
WL-35	If screening is not feasible, the pond will be designed with steep sides to minimize shallow area that would be used by wading birds.		X
WL-36	Evaporation ponds will be monitored for wildlife mortality and a contingency plan for wildlife mortality incidents will be developed in consultation with the BLM, NDOW, and USFWS. The contingency plan will include short and long-term measures to deter wildlife from the area.		X
WL-37	Evaporation ponds will be monitored for increased levels of toxicity and a mitigation plan will be ready for implementation should toxicity levels rise.		X

A.7 Historic and Cultural Resources

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
CLT-1	Historic Properties Treatment Plan (HPTP) – An HPTP has been designed and will be implemented prior to construction to resolve any adverse effects to cultural resources. Mitigation measures would include data recovery methods in the case of this Project.	X	

A.8 Paleontological Resources

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
PALEO-1	Paleontological Resources Monitoring and Mitigation Plan - If scientifically significant paleontological resources (e.g., vertebrate fossils) are found at any time during construction, work shall be redirected to another area so that the scientific significance of the discovery may be assessed by the BLM. Solar Millennium, LLC, must immediately contact the BLM paleontological coordinator of the Pahrump Field Office and the BLM regional paleontologist so that they can assess the significance of the discovery and recommend mitigation measures, as necessary. If warranted, a paleontologist approved by the BLM will be retained to design and implement a monitoring program during project-related excavation (earth-moving) activities. Based on the new discovery, the paleontologist will review excavation plans and geotechnical data to determine more specifically where paleontologically sensitive stratigraphic units may be disturbed by project-related excavation. Excavations would be monitored where these activities may potentially disturb previously undisturbed paleontologically sensitive sediment that may contain additional paleontological resources. This measure will be implemented by requiring paleontological monitoring in geological units designated as having a high potential to contain paleontological resources. The paleontological monitoring plan calls for the placement of one paleontological monitor at each construction location in all areas of high paleontological potential.	X	
PALEO-2	Construction Personnel Education - An orientation workshop and training will be prepared, reviewed by the BLM, and presented by a paleontologist approved by the BLM to explain paleontological mitigation guidelines and procedures to the contractor and construction workers.	X	
PALEO-3	Curation and Final Report - All fossils collected during construction will be prepared to a point where identification and permanent preservation is possible. Screen washing of fossiliferous sediment samples will be done in order to collect	X	

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
	small or microscopic vertebrate fossils. A final report will be prepared by the paleontologist and distributed to the appropriate lead agencies.		
PALEO-4	Deposition in a Paleontological Repository - Fossils collected during construction will be curated into the collections of an accredited, Federally-approved, professional repository with long-term retrievable storage, such as the Nevada State Museum.	X	

A.9 Land Use, Recreation, Transportation, and Access

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
TRANS-1	Project owner will provide improvements required in the Master Traffic Impact Analysis.	X	

A.10 Visual Resources

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
VIS-1	Color mitigation – Owner shall treat surfaces of all ancillary facilities, excluding the solar arrays, visible to the public with paint colors that blend with the surrounding landscape ('desert' browns and tans).	X	X
VIS-2	Landscape Screening – Landscape screening may be used to reduce visibility of the project in locations that high sensitivity viewers have unobstructed foreground views of the project. This condition pertains to the residences located along Sandy Lane and just east of Valley View Road.	X	X
VIS-3	Restoration of Disturbed Areas – Any temporary areas that are used during the construction process are to be restored (vegetation, topographic).	X	
VIS-4	Nighttime Lighting – Owner shall consider location and type of lighting to minimize any potential light pollution to the greatest extent practicable. Measures may include, but not be limited to, light hoods/shields, directional lighting, minimum required brightness, setbacks from project perimeter, and 'as-needed' usage.	X	X

A.11 Hazardous Materials and Hazardous and Solid Waste

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
HAZ-1	An onsite construction safety officer will be designated to implement health and safety guidelines and, if necessary, contact emergency response personnel and local hospitals.	X	
HAZ-2	Project construction contractors will be required to develop standard operating procedures for servicing and fueling construction equipment. These procedures will, at a minimum, include the following: • No smoking, open flames or welding will be allowed in fueling/service areas. • Servicing and fueling of vehicles and equipment will occur only in designated areas. These areas will be bermed, covered with concrete, or fashioned in some other manner to control potential spills. • Fueling, service and maintenance will be conducted only by authorized, trained personnel. • Refueling will be conducted only with approved pumps, hoses, and nozzles. • All disconnected hoses will be handled in a manner to prevent residual fuel and liquids from being released into the environment. • Drip pans will be placed under equipment to collect small drips and minimize potential spills during servicing. • Service trucks will be equipped with fire extinguishers, PPE, and spill containment equipment, such as absorbents. • Service trucks will not remain on the job site after fueling and service are complete.	X	
HAZ-3	Emergency telephone numbers will be available on site for the fire department, police, local hospitals, ambulance service(s), and environmental regulatory agencies.	X	X
HAZ-4	Containers used to store hazardous materials will be properly labeled and kept in good condition.	X	X
HAZ-5	Hazardous materials storage will typically consist of storage of oil within equipment, ASTs, 55-gallon drums, or 5-gallon pails of lubricants and oils, and smaller containers of paints and solvents. These materials will be managed as described below to mitigate potential releases. • Hazardous materials will be stored in accordance with applicable regulations and codes, e.g., the Uniform Fire Code.	X	X

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
	• Trucks delivering hazardous materials will be parked adjacent to the usage area or storage area where the chemicals are to be stored to minimize potential unloading and transportation accidents. • Incompatible materials will be stored separately. • Containerized hazardous materials will be stored in original containers appropriately designed for the individual characteristics of the contained material. Containers will be labeled with contents in accordance with the OSHA Hazard Communication Standard (Title 29 CFR Part 1910.1200). • Hazardous materials will be stored within secondary containment structures. These structures will have capacity for the largest container plus an allowance for rainwater equivalent to a 24-hour, 25-year storm, if the area is outdoors. Alternatively, containerized hazardous materials may also be stored in commercially available hazardous materials storage sheds with built-in secondary containment. • Empty containers, especially portable totes and drums, will be emptied, drained, and returned to the supplier for reuse to the maximum extent possible or recycled off site. • Pollution prevention efforts such as replacement of hazardous materials with less hazardous materials, reduction of hazardous waste generation volumes, and recycling will be employed at the facility, as practical.		
HAZ-6	The project owner will develop and implement spill response procedures. Personnel working with hazardous materials will be trained in proper handling and emergency response to chemical spills or accidental releases. Additionally, designated personnel will be trained as a facility hazardous materials response team. Safety equipment will be provided for use as required during chemical containment and cleanup activities, and will include safety showers and eyewash stations. The facility will maintain on site one or more spill response kits. These kits will contain absorbents appropriate for the hazardous materials kept on site and each kit will be clearly designated for the type of spilled material for which it should be used.	X	X
HAZ-7	The project owner will develop and implement several programs to address hazardous materials storage and security, emergency response procedures, employee training requirements, hazard recognition fire safety, first-aid/emergency medical procedures, hazardous materials release containment/control procedures, hazard communication training, PPE training, and release reporting requirements. These programs will include a Hazardous	X	X

Reference Number	Mitigation Measures	Mitigation Application Process	
		Construction	Operation and Maintenance
	Material Business Plan, worker safety program, fire response program, plant health and safety program, and facility standard operating procedures. The Plan will include procedures on hazardous materials handling, use, and storage; emergency response; spill prevention and control; training; record keeping; and reporting.		

Water Mitigation Stipulation

As agreed to by Solar Millennium, National Park Service – Death Valley National Park, U.S. Fish and Wildlife, Bureau of Land Management, and Nye County

The following water mitigation measures, designed specifically to reduce potential impacts to sensitive species occurring at Ash Meadows National Wildlife Refuge and Devils Hole, have been agreed to by Solar Millennium (Proponent), National Park Service (NPS) – Death Valley National Park, U.S. Fish and Wildlife Service (USFWS), the Bureau of Land Management (BLM), and Nye County.

The Proponent will acquire no less than 236 acre-feet/year of existing water rights (MWR – Minimization Water Rights) from within Basin No. 230 (Amargosa Desert Hydrographic Basin). Acquisition of the MWR shall meet the following criteria:

- These water rights shall be geographically closer to Devils Hole and Ash Meadows than the two municipal Nye County Wells situated at Lathrop Wells.

- Preference would be for the acquisition of senior water rights coming from the 7,000 acre feet available in Basin No. 230; preference (in terms of manner of use) for acquisition of these rights would be from existing agricultural use.

- The average historical use of the acquired water rights shall be equivalent to the permitted annual duty of those rights. If water rights meeting this criterion are unavailable, water rights shall be acquired such that the cumulative historical pumping average is no less than 236 acre-feet/year.

These water rights will be held by the Proponent until such time that a Memorandum of Understanding (MOU) is consented on between BLM, USFWS, NPS, and Nye County.

A consensus from all parties will need to be reached within 5 years of acquisition due to the requirement of the State Engineer to show proof of beneficial use of the water rights.

The Minimization Water Rights shall be indefinitely retired by the Proponent if an MOU is not signed within the 5 year period.

- The 4-party MOU shall instruct that the acquired water rights not be used until such time that all four parties are in consensus that use of the MWR would result in discountable and negligible impacts to the Ash Meadows species and Devils Hole.

- Though details yet to be determined by the MOU, Nye County, in cooperation with the other MOU signatories and other appropriate agencies shall perform studies to better understand how the use of the MWR would impact area resources. These include Devil's Hole, Ash Meadows, and overall local and regional water levels. The details and ultimate goals of the studies shall be agreed upon by Nye County, BLM, NPS, and USFWS.

Upon completion of the studies to be determined by the MOU, if results of those studies demonstrate negative effects to the Ash Meadows species and Devils Hole in association with continued pumping of all or a portion of the MWR, then all or a portion of the MWR shall be retired indefinitely.

- Upon completion of the studies to be determined by the MOU, if results of those studies demonstrate no negative effects to the Ash Meadows species and Devils Hole, in association with continued pumping of all or a portion of the MWR, then all or a portion of the MWR shall be available for use by Nye County, pending State Engineer approval.
- A consensus that no negative effects would result from the use of the MWR would need to be reached from all parties in the MOU.
- If no conclusive evidence is available at the time that the State Engineer requires proof of beneficial use of the MWR, then those water rights shall be retired indefinitely.

Upon signing of the MOU, the ownership of the MWR would be transferred to Nye County. The Proponent would move the point of diversion of the combined MWR to one of two municipal Nye County wells situated at Lathrop Wells (SE ¼ Section 18, T 15S, R 50E), near the intersection of US Hwy 95 and NV Hwy 373, in accordance with Nevada State Engineer's Order 1197. Nye County will be responsible for any studies required to determine the impact of using all or a portion of the acquired MWR. These studies shall include, but are not limited to, simulations using the Death Valley Regional Flow System model (DVRFS) and Southern Amargosa Embedded Model (SAMM) programs, as well as metering and monitoring. The details of the studies will be determined within the MOU, on which the BLM, USFWS, NPS, and Nye County will be signatories.

Support of Amargosa Monitoring Network and Groundwater Model – Solar Millennium has agreed to contribute $6,000 annually, for the life of the Project, to the operation and maintenance of the existing Amargosa Monitoring Network. At current cost levels, $6,000 is the estimated cost of operating three monitoring wells for one year. This includes field measurements and overhead costs.

The Amargosa Monitoring Network is an integral component of the DVRFS and SAMM programs. SAMM is a refinement to a portion of the DVRFS which will enable improved modeling of the Amargosa Valley by utilizing a smaller grid size and more detailed hydrogeologic framework. To date, the BLM has contributed $250,000 and committed additional future support towards the most recent update of the DVRFS and SAMM, as well as $30,000 to the Amargosa Monitoring Network for the next four years of operations.

Appendix B

Groundwater Modeling Report

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Groundwater Modeling Services to Support the Amargosa Road Solar Power Project EIS Technical Memorandum

by
GeoTrans, Inc.

Introduction

The purpose of this report is to document the results of modeling simulations performed to evaluate the potential hydraulic effects of pumping 400 afy on nearby water resources, such as Devils Hole which is the only naturally occurring habitat for the Devils Hole Pupfish and discharge at Ash Meadows, for the EIS. Figure 1 shows the location of the Project area. Modeling was performed using the Death Valley Regional Flow System (DVRFS) Model (Belcher, 2004). The DVRFS model is the only existing model of the study area. This model was calibrated to both pre-pumping and pumping conditions. The Amargosa Basin is one of the areas covered by the model in which there has been significant pumping, and water-level changes measured in the area were used to guide calibration of the model. As with any model, improvements can always be made, and the predictive results should be evaluated accordingly.

Groundwater Model Background

This model was developed by the U.S. Geological Survey (USGS) over a period of approximately eight years. The effort was funded primarily by the Department of Energy (DOE) through programs at the Nevada Test Site and at Yucca Mountain, with support and review by other Federal Agencies, including the National Park Service. The present model was developed in two phases. The first phase was the development of a three-dimensional flow model to simulate pre-development (steady-state) conditions, using geologic models developed separately by a contractor for the Underground Testing Area (UGTA) Project and by the USGS for the Yucca Mountain Project. The second phase of the DVRFS model development involved construction of a new geologic model, and development and calibration of the resulting new flow model to both pre-development and post-development conditions. The model produced from the second phase has commonly been called the "transient" model. GeoTrans was instrumental in the development of the UGTA model, and represented the UGTA Project during the development of the DVRFS model by the USGS. GeoTrans worked closely with the USGS, reviewing many of the products and modeling datasets, but did not perform any of the actual development effort.

In the following discussion, the term "model" will generally apply to the three-dimensional USGS DVRFS transient flow model.

Documentation of the model (DVRFS report) is available online (http://pubs.usgs.gov/sir/2004/5205/). In addition to the report itself, there are many supporting documents on geologic and hydrologic investigations performed to support

development of the model. Hydrologic investigations relevant to the Amargosa Desert include measurements of evapotranspiration (ET) at Ash Meadows, in Death Valley, and in Oasis Valley; estimation of ET at Franklin Lake playa and near Franklin Well (Amargosa River); construction of a dataset for pumping in the Amargosa Desert (and other areas); and measurement of groundwater recharge underneath the Amargosa River and irrigated fields in the Amargosa Farms area.

The model is developed using MODFLOW-2000 (Harbaugh et al., 2000), using a grid with a lateral spacing of 1,500 meters, and a variable vertical spacing. There are 16 model layers, with an interpretation of the water table used as a reference surface from which to base the elevation of the upper model layer. A large number of layers is needed to capture the geologic complexity incorporated into the geologic framework model, which is itself a simplification and interpretation of the actual geology. The model assumes that all layers are fully saturated, and that dewatering does not occur. Thus, transmissivities do not become smaller with drawdown, and the model is approximately mathematically linear. Because the Drain package is used to simulate springs, the model would not be strictly linear if drawdown is sufficient to cause water levels in a cell to decrease below the specified elevation of a drain. In addition, if drawdown is sufficient to cause appreciable decreases in the saturated thickness of the aquifer being pumped, the model will tend to underestimate the drawdown and overestimate the productivity of the aquifer.

The model was calibrated using a non-linear regression technique which optimizes modeling parameters to minimize the objective function, which was the sum of squared weighted residuals. A residual is defined as the difference between the observed (or estimated) value for a calibration target, and the corresponding simulated value. Hydraulic heads, water-level changes, discharge rates in spring areas, and lateral boundary fluxes were used as calibration targets. As the objective function represents the entire model, rather than concentrating on the Amargosa Farms and Ash Meadows areas, the agreement of simulated water-level change and measured change at Devils Hole is reasonable, but could be improved with additional work.

Following publication of the DVRFS report, a minor error was detected in the geologic model in the Oasis Valley area. The simulations reported here were performed with the updated model, which was downloaded from the above web site. Also, the modeling pumping and return flow datasets were updated in 2003 by the USGS to include updated estimates of groundwater withdrawal and return flow from irrigation (Moreo and Justet, 2008). This updated dataset was also used in the simulations reported here.

It should be noted that the USGS pumping dataset has different groundwater withdrawal amounts than the State Engineer's groundwater withdrawal inventory for the Amargosa Desert Hydrographic Basin. The USGS used satellite imagery and consumptive use estimates to create their groundwater withdrawal inventory. The State Engineer's inventory is based upon metered amounts or estimates provided by water rights owners. Since the DVRFS model was calibrated using the USGS pumping inventory, the same datasets were used in this study.

Groundwater Model Limitations

As stated earlier, the DVRFS model is the only existing groundwater flow model of the study area. Before evaluating predictions of drawdown at Devils Hole or change in discharge at Ash Meadows using the DVRFS model, the reader needs to be aware of the limitations of using a regional-scale groundwater model to evaluate potential water resource impacts at springs or other sites (e.g., Devils Hole) that are local in scale (feet). These limitations include 1) model grid size (1,500 m x 1,500 m), 2) calibration to regional groundwater flow conditions, 3) estimates in historic pumping dataset and 4) simplification of geology. The DVRFS model report (p. 350) states "the use of the (DVRFS) model to address regional-scale issues or questions is the most appropriate use of the model." All the model results presented here are not accurate to the feet scale, but several meters. The DVRFS model gives you a qualitative sense of how water levels change over time at a given location, not quantitative.

Before conducting predictive modeling simulations, it is important to compare calculations of water-level change at Devils Hole with measured changes. Figure 2 shows the comparison through 2003, the end of the updated pumping and return flow dataset. Provisional water-level data after 1989 was received from National Park Service (NPS, 2006). Several features should be noted:

1. Both the measurement dataset and the simulated levels show declining water levels prior to the start of significant pumping in the Ash Meadows area. The simulated rate of decline is faster than the observed rate. The model is also slower to respond to changes in pumping rates.
2. The effects of pumping in Ash Meadows are readily apparent in both the measurements and simulated results beginning in approximately 1970, but the simulated change is greater than the measured change.
3. In the original 1998 model, during three periods beginning approximately in 1975, 1987, and 1998, there are simulated declines that do not occur in the measured values. The model values do not recover as much as the measurements following cessation of nearby pumping. In the updated 2003 model, the simulated decline starting around 1975 still remains to a lesser degree, but the other two declines have been corrected. We suspect there is still an error in the historical pumping dataset prepared by the USGS for the 1975 period.
4. The effects of seasonal barometric changes, seasonal pumping, and earthquakes are not incorporated in the model.
5. Beginning in 1996, until 2003, the model simulates a decline in water levels.

In summary, the model overpredicts the drawdown caused by historical local pumping by approximately 30%. However, the model does a reasonable job in matching the water level trends at Devils Hole after the 1970s. Even with the model limitations and assumptions presented above, the model can still be used as a qualitative tool to provide information on the potential impacts to local groundwater resources.

Groundwater Model Simulations and Assumptions

After updating the USGS DVRFS model through 2003 with the revised pumping and return flow dataset, GeoTrans conducted several groundwater modeling scenarios using this updated model. Based on discussions with Project team members the following modeling scenarios were proposed and/or simulated as part of this Project:

1. Run existing DVRFS model an additional 200 years past the transient calibration period with 2003 pumping (i.e., No Action).
2. Same as Scenario 1 except add the proposed action of 400 afy from the proposed Project well (600 afy during the 39 month construction period) from 2010-2039 (i.e., Proposed Action).
3. After transient calibration period, incrementally decline Amargosa Farms pumping to stabilize water levels at Devils Hole.
4. After transient calibration period, turn off injection wells in Amargosa Farms.
5. After transient calibration period, reduce recharge in Amargosa Farms based on Stonestrom et al. 2003 and 2007 findings.

Scenarios 3 through 5 were added to examine the effects of reducing groundwater withdrawal and change in return flow and recharge from the Amargosa Farms area on Devils Hole water levels.

The following assumptions were made during the modeling scenario simulations:

1. No climatic effects – The current recharge dataset was used for the 200 year simulations. The effect of water rights users irrigating more or less due to climate than 2003 amounts was not estimated.
2. The Project groundwater withdrawal of 400 afy for the 30 year operational period (600 afy during the 39 month construction period) was added to the 2003 pumping dataset since the USGS estimate for 2003 was below the duty (603 afy) minus the Project pumping (400 afy). It is assumed that existing pumping from the Project well plus the 400 afy from the Project would not exceed the duty of 603 afy in the 200 year simulations.
3. Water infiltration from mirror washing was not accounted for because it is assumed to not contribute to groundwater recharge.

Groundwater Model Results

Figure 3 shows the simulated water-level elevation at the end of 2003 based on the revised pumping and return flow datasets. The water level contours indicate that the potentiometric surface of the valley fill indicate a broad and gently sloping gradient from the northeast toward the central axis of the valley and southwest toward the Funeral Mountains.

Figure 4 shows simulated drawdown contours at the end of 2003. This map represents the change in water level from pre-development (1912) to 2003. Within the Amargosa

Basin, the most rapid water level declines occurred in the Amargosa Farms area, which is consistent with observed water level changes from other studies (Kilroy, 1991). Devils Hole is approximately 15 miles from the proposed pumping and the simulated drawdown at Devils Hole in 2003 is approximately 1.8 ft.

Scenario 1 (Existing Pumping or No Action) Results

For scenario 1 (no action), 2003 pumping and return flow was repeated every year for the next 200 years to determine the change in water levels at Devils Hole. Figure 5 shows change in simulated water-level contours from 2003 to 2203. Drawdown is predicted to be more than 10 feet over a large area including Ash Meadows NWR.

Figure 6 shows that simulated water levels at Devils Hole decline over 13 feet after 200 years due to existing pumping. Note "time zero" is assumed to be the simulated water-level elevation on December 31, 2003 from the model, not pre-development conditions. An important conclusion from Scenario 1 is that the cumulative effect of 2003 groundwater withdrawal levels continuing into the future will cause an impact to Devils Hole and Ash Meadows even though the magnitude and timing of this impact is uncertain. It is likely water levels at Devils Hole will fall below the U.S. District mandated level, but as stated in the last sentence the timing cannot be quantified at this time.

Scenario 2 (Proposed Action) Results

For the proposed action, the 400 afy of groundwater withdrawal was simulated from the proposed Project well. Project pumping is assumed to start in 2010 and concludes in 2039 since the Project life is 30 years. The first 39 months (construction phase) of the Project will require 600 afy of groundwater instead of the long-term groundwater withdrawal of 400 afy. Table 1 shows the location of the proposed Project well. The Project well was pumped from Layer 1 in the model since Layer 1 was deeper than the depth of the well.

Table 1. Proposed Project Groundwater Withdrawal

App. No.	Easting (m)	Northing (m)	Duty (afy)	Proposed w/d (afy)	Model Row	Model Column	Model Layer
15893	542362.42	4044948.68	603	183	116	71	1

Figure 7 shows the simulated water-level decline from the existing pumping and the Project pumping from 2003 to 2203. The Project pumping reduces simulated water levels at Devils Hole by approximately 0.05 ft or 0.6 in after 200 years. Recall this reduction in water levels is approximately 30% higher due to the model overpredicting water level declines at Devils Hole historically (See Figure 2). Also, the DVRFS model calibration is not accurate to 0.05 ft but meters and is not designed to exactly measure drawdown at a spring location several miles away, such as Devils Hole because of its 1) grid size (1,500 m x 1,500 m), 2) calibration to regional groundwater conditions, 3) estimates in historic pumping dataset and 4) simplification of geology. Thus, the regional model has a limited capability to accurately evaluate incremental changes in pumping tens of miles away on Devils Hole, but it is the only groundwater flow model available.

The Project groundwater withdrawal should result in a minimal effect on Devils Hole water levels and local water users. There will be a small difference in groundwater recharge between the shift from an agricultural to industrial beneficial use. Studies have been performed on irrigation return flow adjacent to the property (Stonestrom et al. 2003 and 2007), but give a range of values for recharge from two different methods: 1) 0.1 to 0.5 m/yr (4 to 20 in/yr) from vertical profiles of water potential and environmental tracers and 2) 9-22% of infiltrated irrigation from chloride mass-balance estimates. The reason the model does not show zero water-level change at Devils Hole due to Project pumping is due to the USGS estimate for 2003 groundwater withdrawal from the Project well being lower than 203 afy.

Scenario 3 Results

Figure 8 shows the effect on simulated water-level change at Devils Hole of incrementally (i.e., 10%) reducing groundwater withdrawal within the Amargosa Basin. In order to stabilize water levels at Devils Hole, pumping in the basin would have to be reduced between 80 and 90% from 2003 levels. Thus, Project pumping would have a negligible effect on the stabilization and/or recovery of water-level changes at Devils Hole. Even if all pumping in Amargosa Basin ceased after 2003, recovery of water levels at Devils Hole would not start occurring for approximately 37 years and take longer than 88 years to fully recover.

Scenario 4 and 5 Results

Figure 9 shows the effect of turning off return flow to the valley-fill deposits from irrigation in the model. Simulated water-level change at Devils Hole would increase approximately an additional 2.3 feet or 18% due to shutting off return flow. Scenario 5, which is reducing recharge to the valley-fill deposits based on the 2003 and 2007 Stonestrom et al. (Stonestrom) studies, was not simulated because the result would fall between the two curves on Figure 9. As discussed earlier, Stonestrom measured the amount of infiltration beneath an irrigated field adjacent to the Project site. The amount of infiltration was measured between 0.1 and 0.5 m/yr. Changing the recharge in the model to any amount in this range would produce a water-level change curve that would fall between the two curves on Figure 9.

Ash Meadows Discharge

Discharge occurs at Ash Meadows because of the presence of the water-bearing carbonate aquifer exposed in the low-lying hills northeast of the discharge area, and the presence of an impediment to flow that causes water levels to be elevated to the land surface. Dudley and Larson (1976) indicate that groundwater flows southwestward toward Ash Meadows in the carbonate aquifer under confined conditions. Water is forced upward "along faults that segment the hills east of Ash Meadows. This produces a mound of unconfined water which discharges laterally into shallower local aquifers."

The USGS code ZONEBUDGET (Harbaugh, 1990) was used to evaluate the changes in water movement for the Amargosa Basin including discharge at Ash Meadows. Under the present-day pumping rates, the model predicts that only minor changes to the discharge rate at Ash Meadows would have occurred by 2003, the end of the model calibration period (Figure 10). When the present-day pumping is continued into the future, the model predicts that impacts to the discharge will occur. In 2203, the discharge is predicted to be reduced from approximately 18,095 acre feet per year (afy) to 15,607 afy. When the Project pumping is added, the discharge rate in 2203 is predicted to be reduced to approximately 15,600 afy or a minimal difference of 7.4 afy or 0.05%.

Results of other hydrologic studies

It would be reasonable to ask whether the historical water-level changes calculated by the model are consistent with the conclusions of other investigators. Two recent investigations evaluated Devils Hole water levels and concluded that pumping, rather than climatic changes, was the cause of historic declines in water levels. The first (Fenelon and Moreo, 2002) evaluated water level changes in wells over a large area that included the Amargosa Desert and Ash Meadows. They considered pumping, changes in recharge rates, earthquakes, and barometric pressure changes as factors that would cause water levels to change. Figure 17 of their report shows the correlation between pumping in the Amargosa Farms area and downward water-level trends over the period of 1992 to 2000 in the Amargosa Farms area. In the Devils Hole area, they consider whether pumping in the Amargosa Farms area could impact Devils Hole water levels, but do not conclude that it has. They also conclude that pumping from well Army 1 near Mercury, NV (see Figure 1) has not impacted Devils Hole water levels based on the lack of response to a reduction in production from Army 1 that began in 1994. They also note that Devils Hole may still be recovering from the pumping in Ash Meadows. The slow recovery to local pumping would suggest that responses to reduction of pumping much further away would be difficult to measure, especially with other stresses changing.

Bedinger and Harrill (2006) evaluated changes in Devils Hole water levels using a regression procedure. They constructed simple Theis models of drawdown caused by pumping at Ash Meadows, the Amargosa Farm area, and Army 1. Temporal changes in pumping rates at these three areas were calculated through superposition. A regression procedure, with water level at Devils Hole as the dependent variable, was used to calculate the relative effects of pumping in these three areas. They determined in a preliminary analysis that consideration of climate variability explained very little of the variability in Devils Hole water levels. The Theis solutions were calculated using hydrologic parameters that might be considered appropriate for the aquifers, but they could not successfully determine these values during "model calibration" because of parameter correlations. They determined that the pumping at Ash Meadows, the Amargosa Desert (Amargosa Farms area) and Army 1 explained 98% of the variability in the annual mean water levels over the period 1962 through 2002. Based on the figures in their report, and the regression parameters, the drawdown in 2002 caused by Ash Meadows pumping was approximately 0.25 feet (and decreasing because of the almost complete cessation of this pumping in 1978), by Amargosa Desert pumping was

approximately 0.5 feet (and increasing), and by Army 1 pumping was approximately 0.2 feet (and decreasing because of decreases in pumping rates beginning in 1995).

Summary

1. Comparison of simulated and observed changes in water levels at Devils Hole through 2003 indicated that the DVRFS model overestimated the change in water level caused by pumping in Amargosa Basin. There may be an error in the historical pumping dataset that affects this comparison. Although the model could be improved by additional work specifically in the Amargosa Desert and Ash Meadows areas, the pumping estimates developed for the model are reasonable.
2. The cumulative effect of 2003 groundwater withdrawal levels continuing into the future (No Action scenario) will cause an impact to water levels at Devils Hole and discharge at Ash Meadows even though the magnitude and timing of this impact is uncertain due to model limitations.
3. The Proposed Action scenario predicts that Project pumping will cause water levels in Devils Hole to decline by approximately 0.05 ft after 200 years. When considering these predictions, it is important to recognize that the model overpredicted the decline in water levels caused by pumping in the Amargosa Basin and is not accurate to 0.05 ft but meters due to its original objective of modeling groundwater flow at a regional scale.
4. The model predicts that the Project pumping will reduce the discharge rate from springs at Ash Meadows a amount of 7.4 afy or 0.05%.
5. Groundwater pumping in the Amargosa Farms area has caused tens of feet of drawdown near the pumping wells. Simple modeling using the Theis equation and superposition, coupled with regression procedures, indicates that the pumping in the Amargosa Farm area is the primary cause of the present-day drawdown at Devils Hole.

Abbreviations or Acronyms

afy – acre-feet per year
DOE – Department of Energy
DVRFS – Death Valley Regional Flow System
ET - evapotranspiration
ft – feet
in – inches
m – meters
NPS – National Park Service
NWR – National Wildlife Refuge
UGTA – Underground Testing Area
USGS – United States Geological Survey
yr – year

References

Belcher, W.R., ed., 2004, Death Valley regional ground-water flow system, Nevada and California—Hydrogeologic framework and transient ground-water flow model: U.S. Geological Survey Scientific Investigations Report 2004-5205, 408 p.

Bedinger, M.S., and Harrill, J.R., 2006, Analytical-regression stage analysis for Devils Hole, Death Valley National Park, Nevada, J. of American Water Resources Association, Vol. 42, No. 4, p. 827-839.

Dudley, W.W., Jr., and Larson, J.D., 1976, Effect of irrigation pumping on desert pupfish habitats in Ash Meadows, Nye County, Nevada: U.S. Geological Survey Professional Paper 927, 52 p.

Fenelon, J.M. and Moreo, M.T., 2002, Trend analysis of ground-water levels and spring discharge in the Yucca Mountain region, Nevada and California, 1960-2000, U.S. Geological Survey Water-Resources Investigations Report 02-4178, 94 p. http://pubs.er.usgs.gov/usgspubs/wri/wri024178

Harbaugh, A.W., 1990, A computer program for calculating subregional water budgets using results from the U.S. Geological Survey modular three-dimensional ground-water flow model: U.S. Geological Survey Open-File Report 90-392, 46 p.

Harbaugh, A.W., Banta, E.R., Hill, M.C., and McDonald, M.G., 2000, MODFLOW-2000, the U.S. Geological Survey modular ground-water model -- User guide to modularization concepts and the Ground-Water Flow Process: U.S. Geological Survey Open-File Report 00-92, 121 p.

Kilroy, K.C. 1991. Ground-Water Conditions in Amargosa Desert, Nevada-California, 1952-1987. U.S. Geological Survey Water Resources Investigations Report 89-4101

Moreo, M.T., and Justet, J., 2008, Update to the ground-water withdrawals database for the Death Valley regional ground-water flow system, Nevada and California, 1913–2003: U.S. Geological Survey Data Series 340, 10 p.

NPS (National Park Service), 2006, Personal Communication with Jennifer Back.

Stonestrom, D.A., Prudic, D.E., Laczniak, R.J., Akstin, K.C., Boyd, R.A., and Henkelman, K.K., 2003, Estimates of deep percolation beneath irrigated fields, native vegetation, and the Amargosa River channel, Amargosa Desert, Nye County, Nevada: U.S. Geological Survey Open-File Report 03–104, 83 p.

Stonestrom, D.A., Prudic, D.E., Walvoord, M.A., Abraham, J.D., Stewart-Deaker, A.E., Glancy, P.A., Constantz, J., Laczniak, R.J., and Andraski, B.J., 2007, Focused Ground-Water Recharge in the Amargosa Desert Basin, USGS Professional Paper

1703—Ground-Water Recharge in the Arid and Semiarid Southwestern United States—Chapter E, p. 107-136.

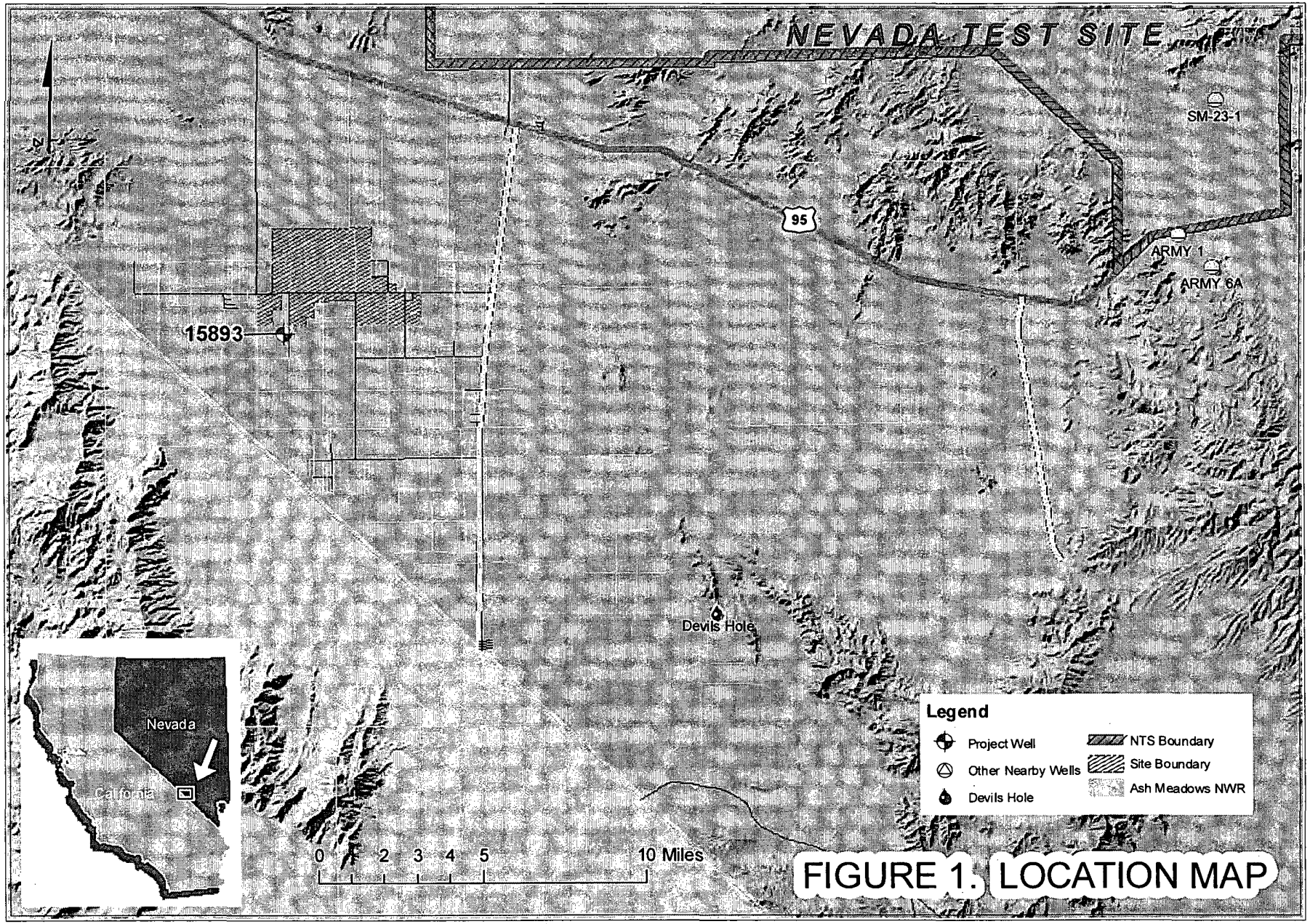

FIGURE 1. LOCATION MAP

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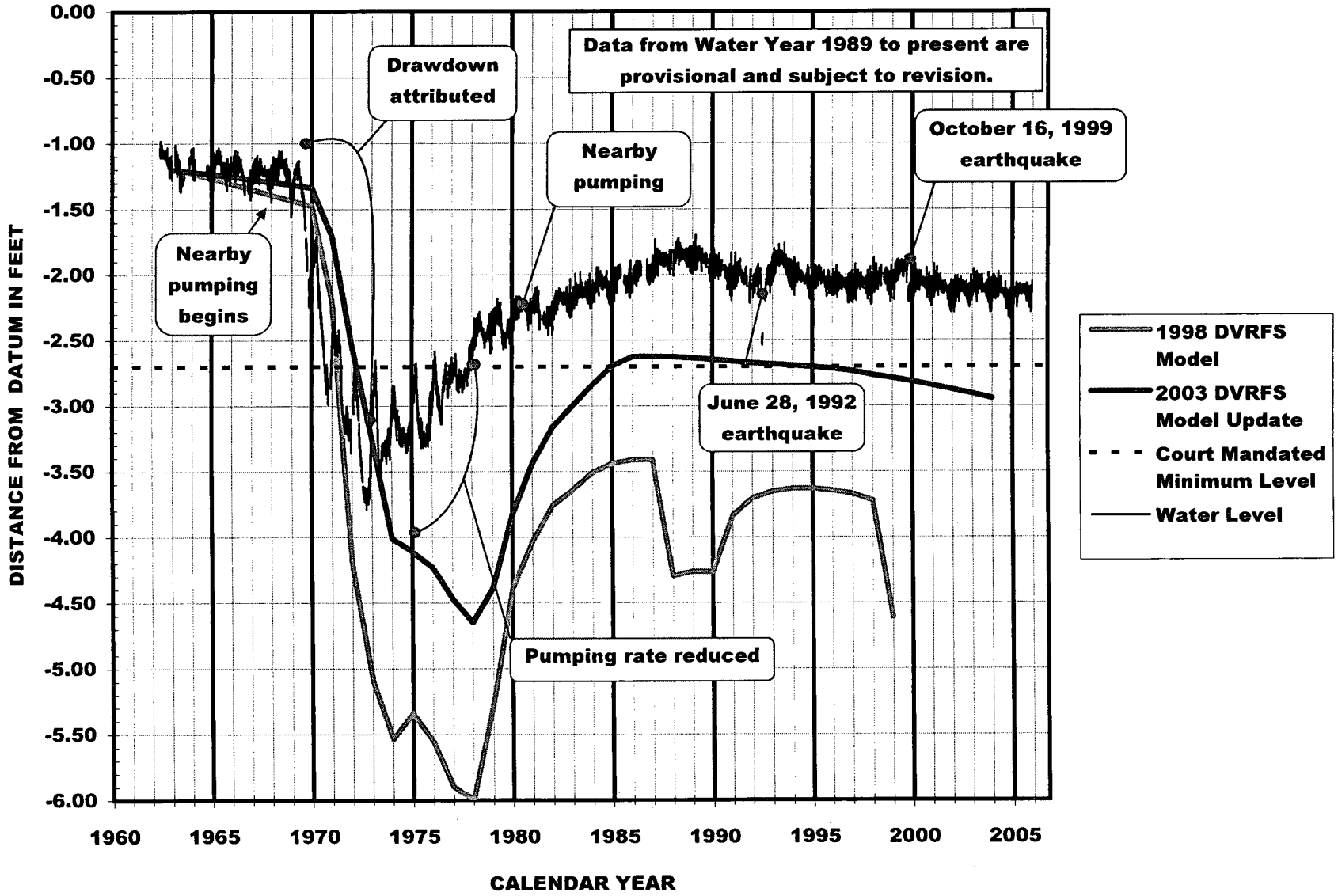
Figure 2. Level of Pool in Devil's Hole
Daily Mean (5/23/1962-12/31/2005)



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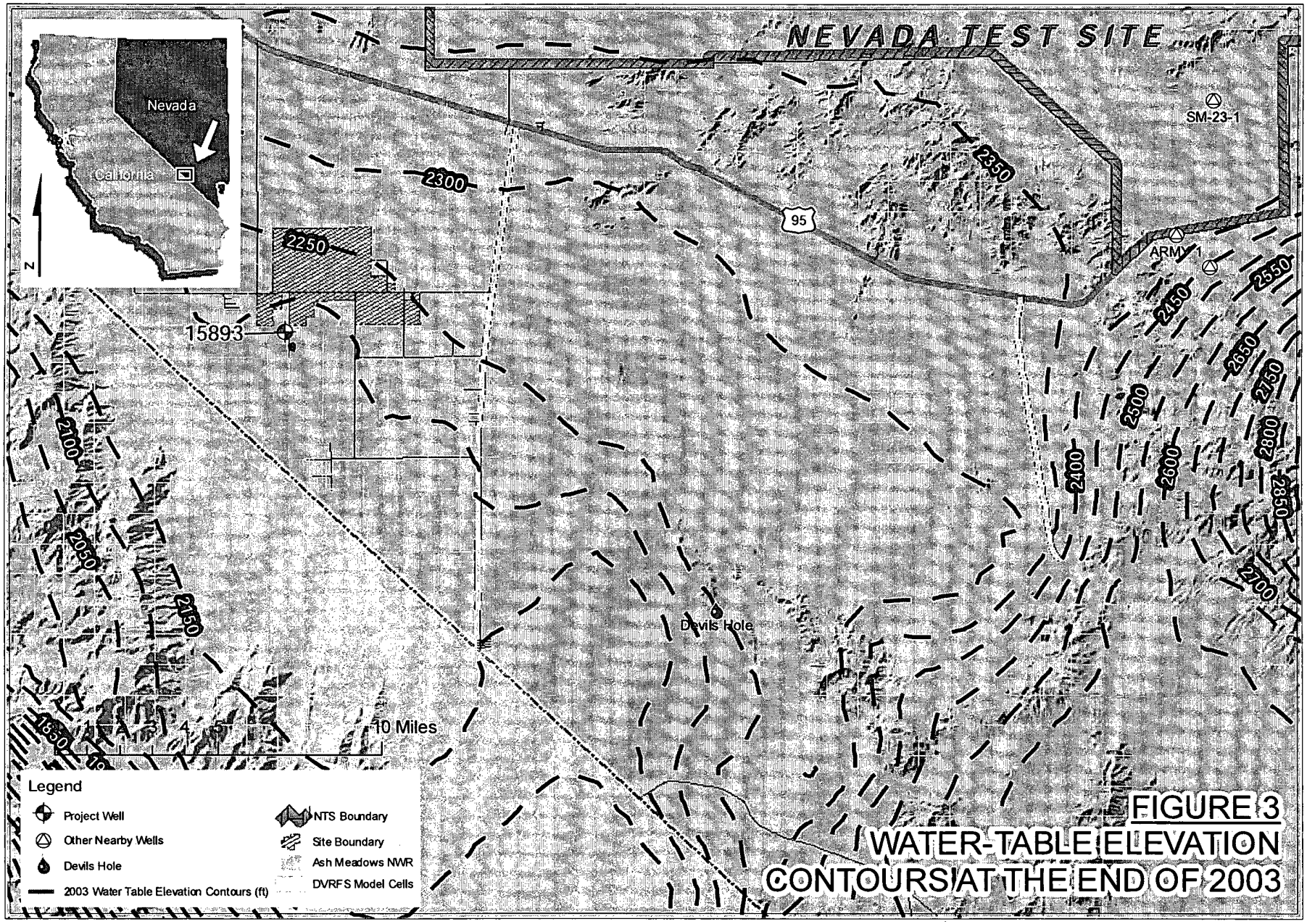

FIGURE 3
WATER-TABLE ELEVATION CONTOURS AT THE END OF 2003

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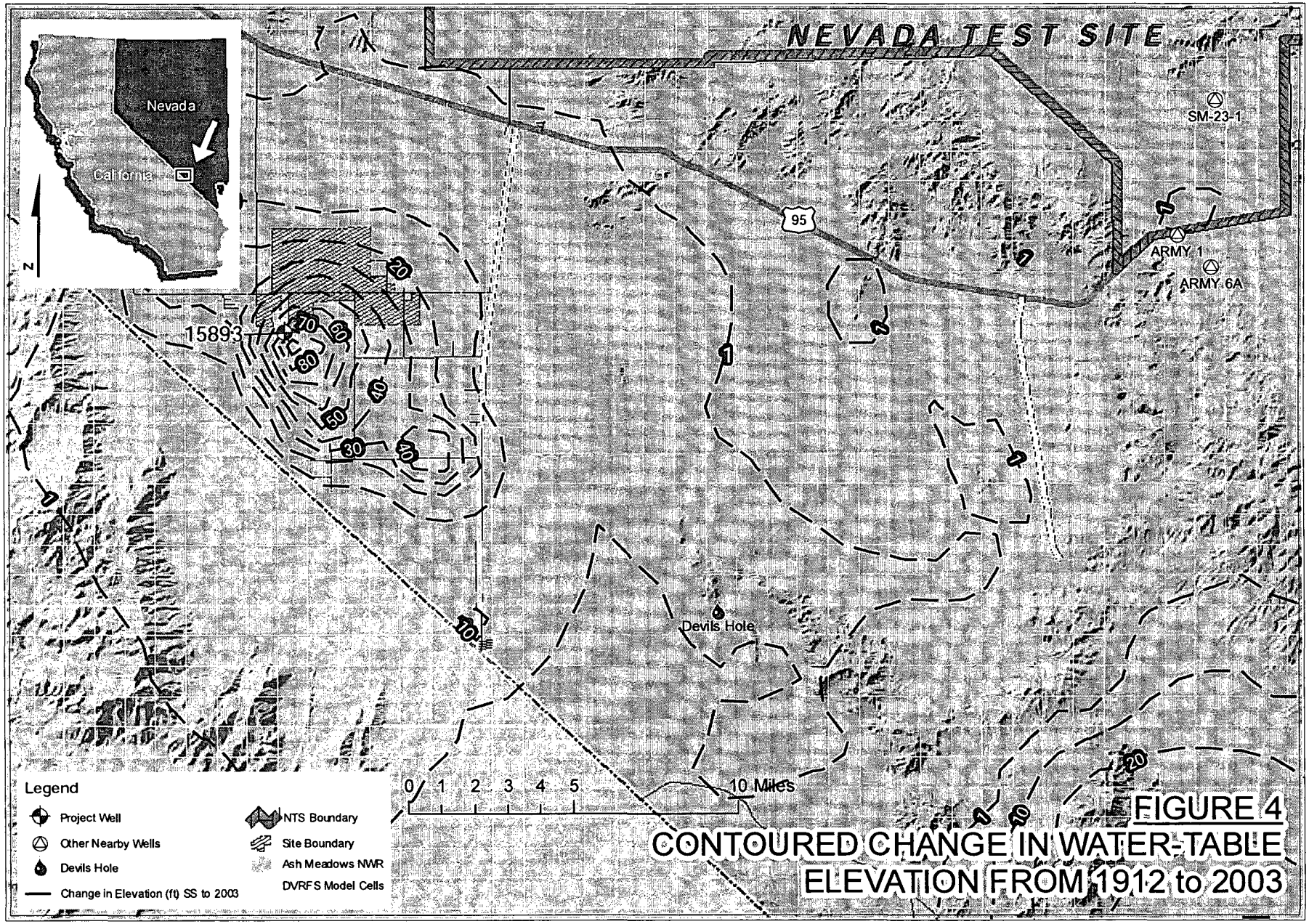

FIGURE 4
CONTOURED CHANGE IN WATER-TABLE ELEVATION FROM 1912 to 2003

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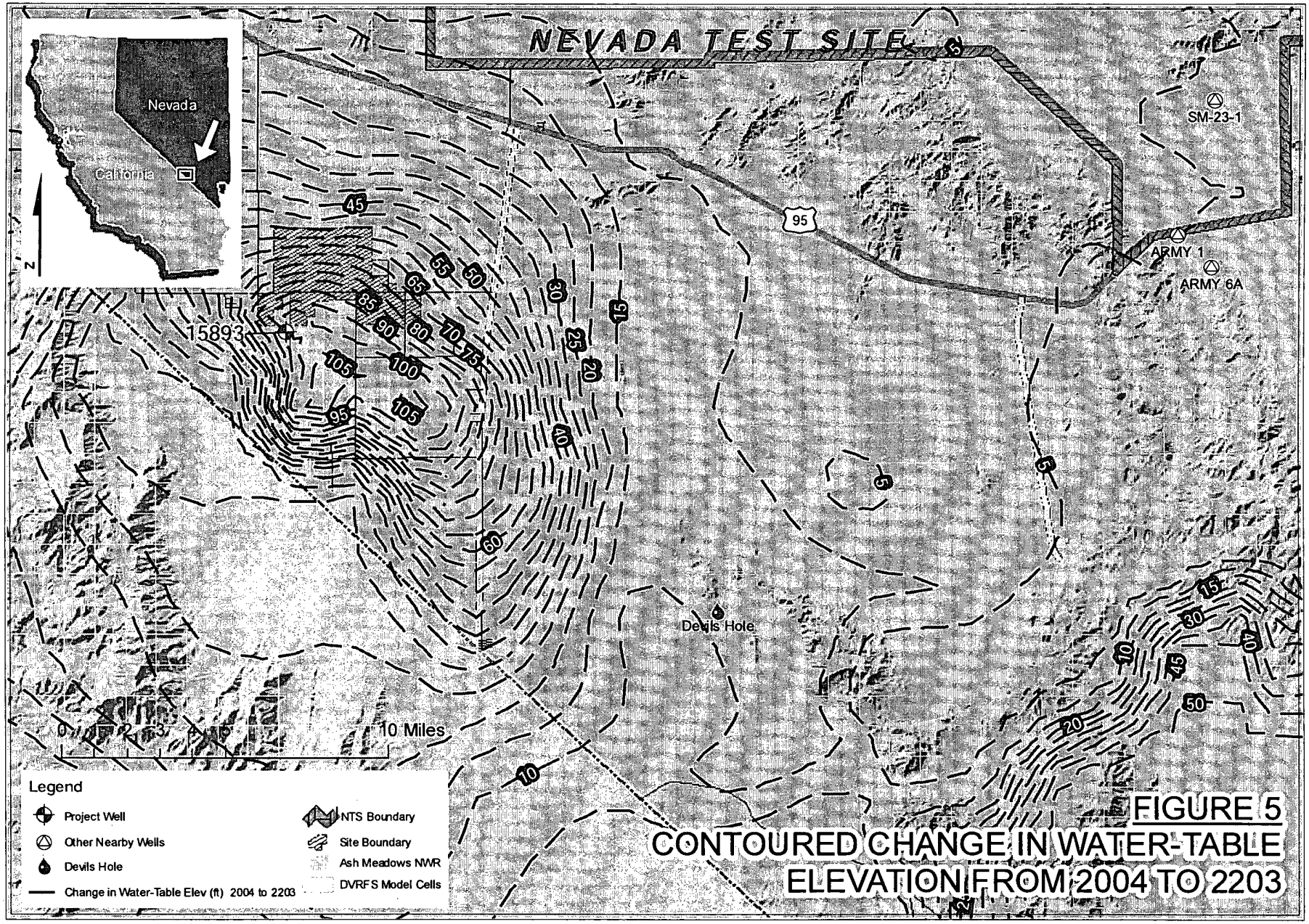

FIGURE 5
CONTOURED CHANGE IN WATER-TABLE ELEVATION FROM 2004 TO 2203

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Figure 6. Change in Water-Level Elevation at Devil's Hole from 2003 to 2203

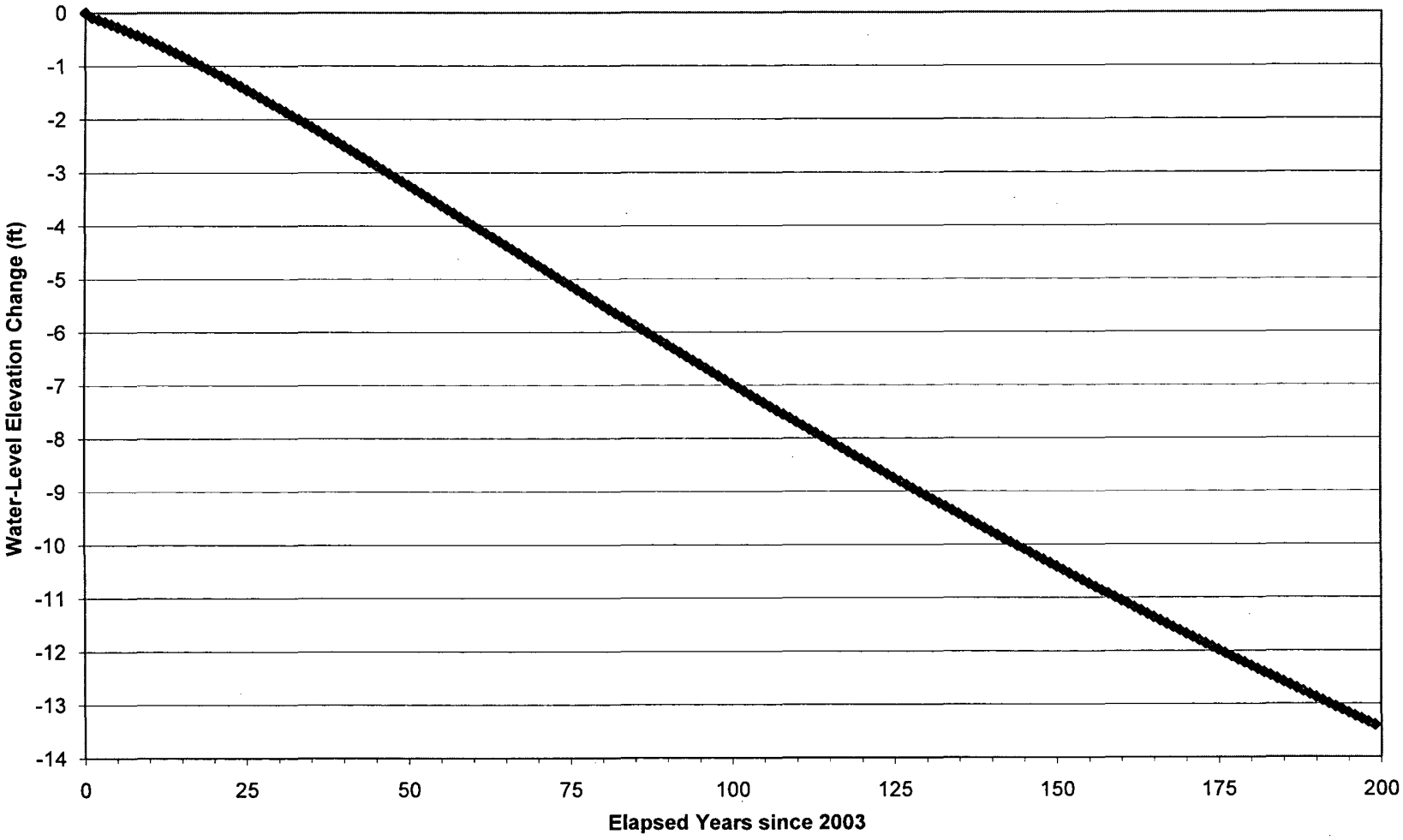

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Figure 7. Change in Water-Level Elevation at Devil's Hole from Proposed Action Pumping from 2003 to 2203

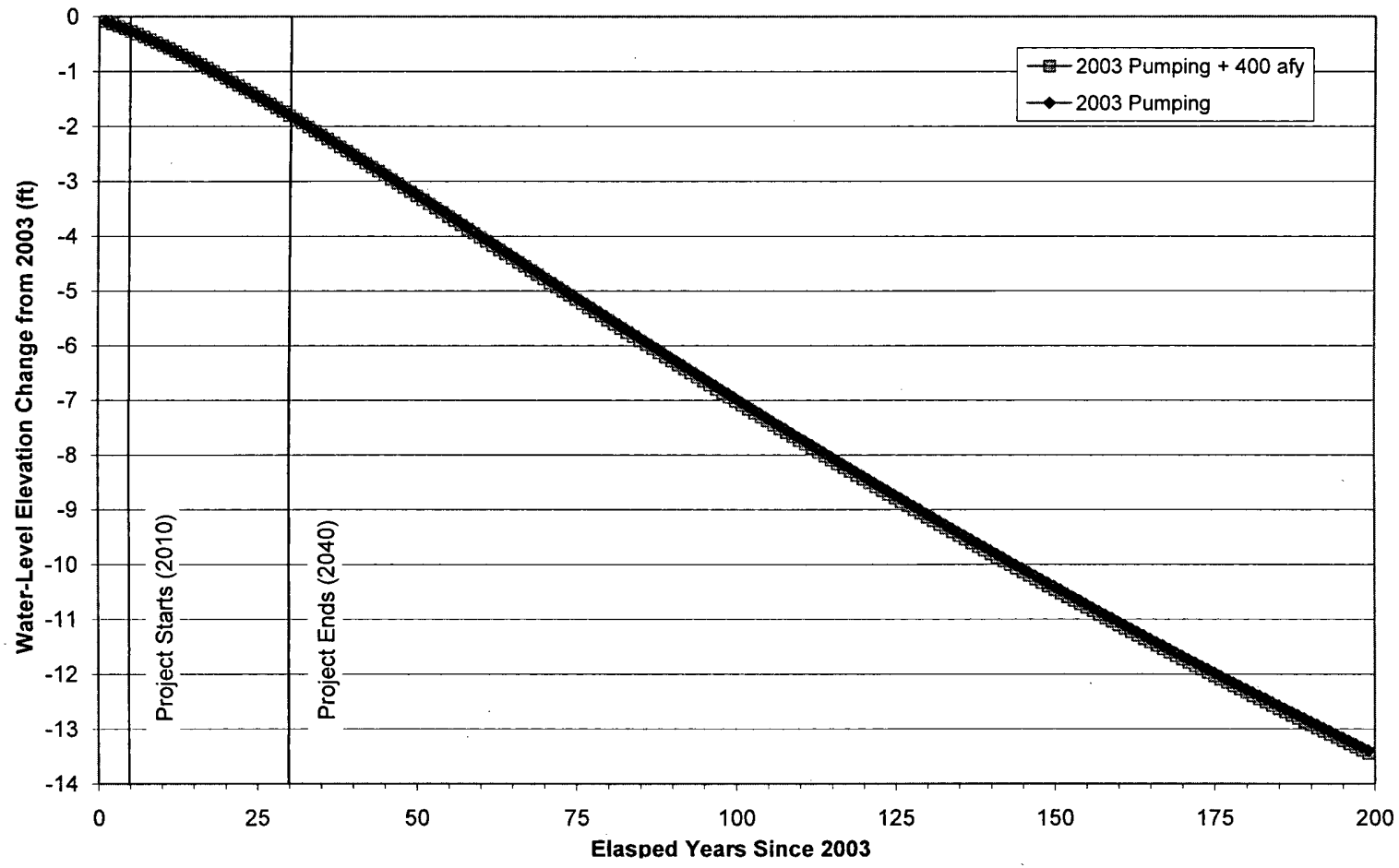

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Figure 8. Effect of Reduced Amargosa Basin Pumping on Devil's Hole Water Levels from 2003 to 2203

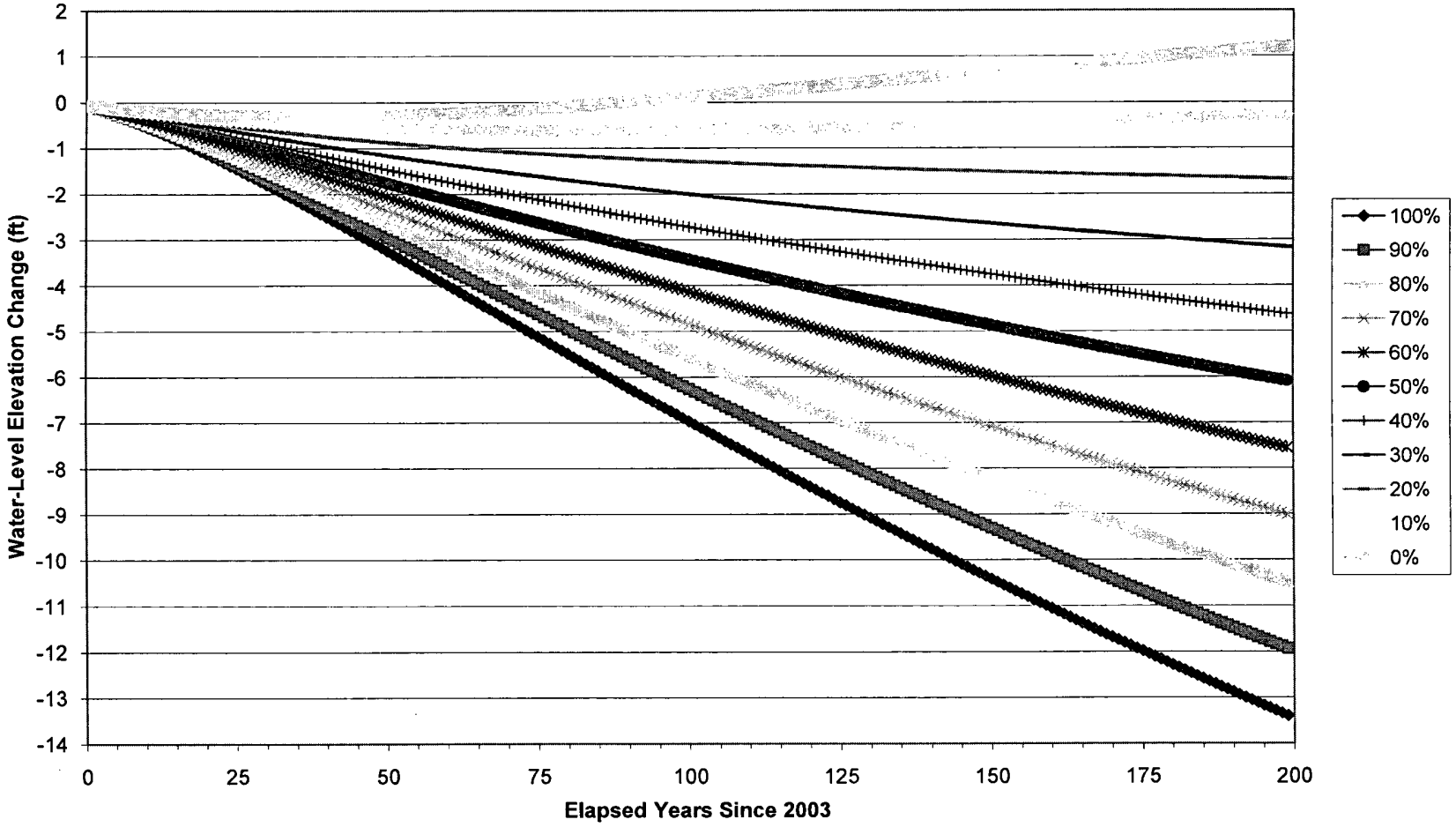

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Figure 9. Effect of No Return Flow in Amargosa Basin from 2003 to 2203

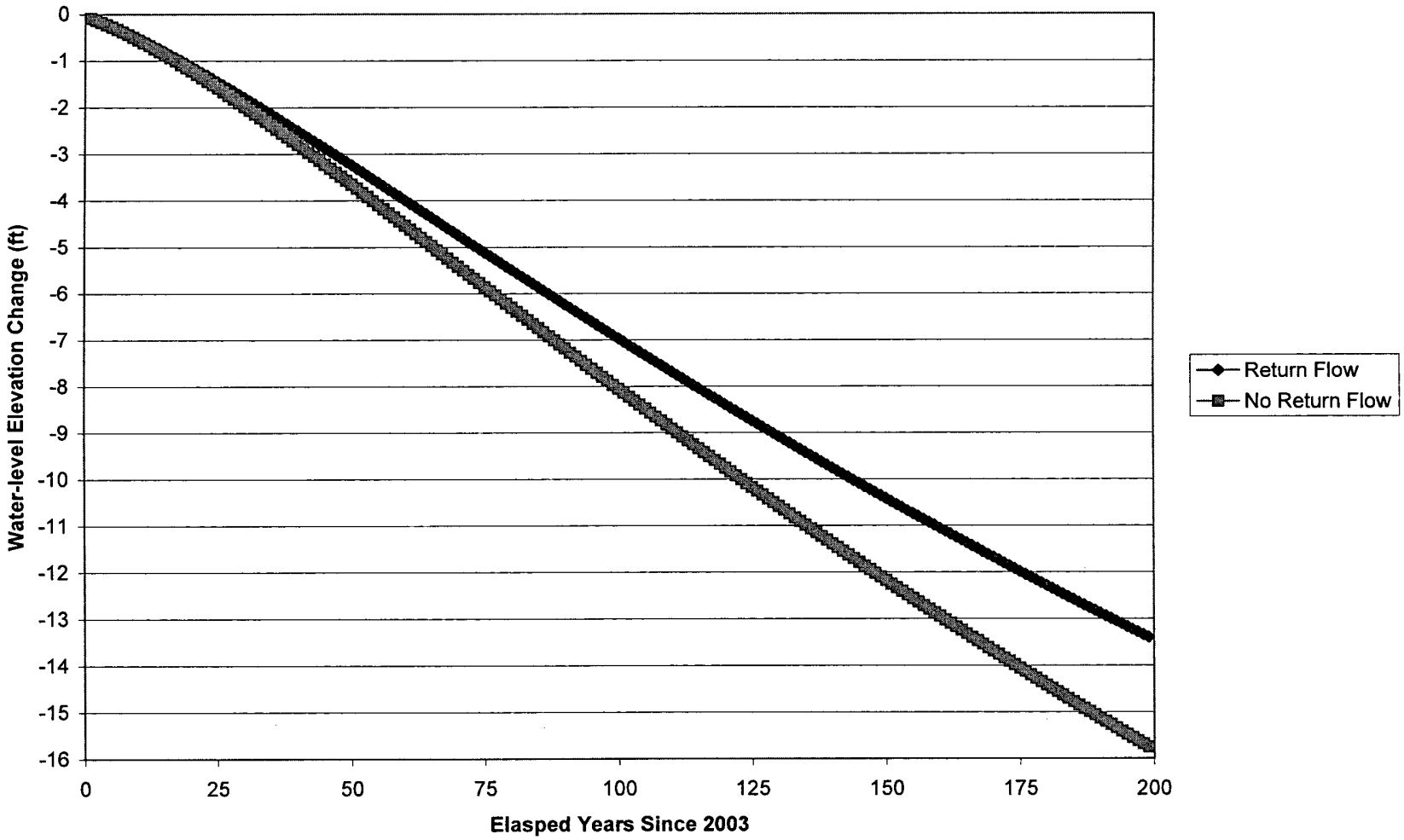

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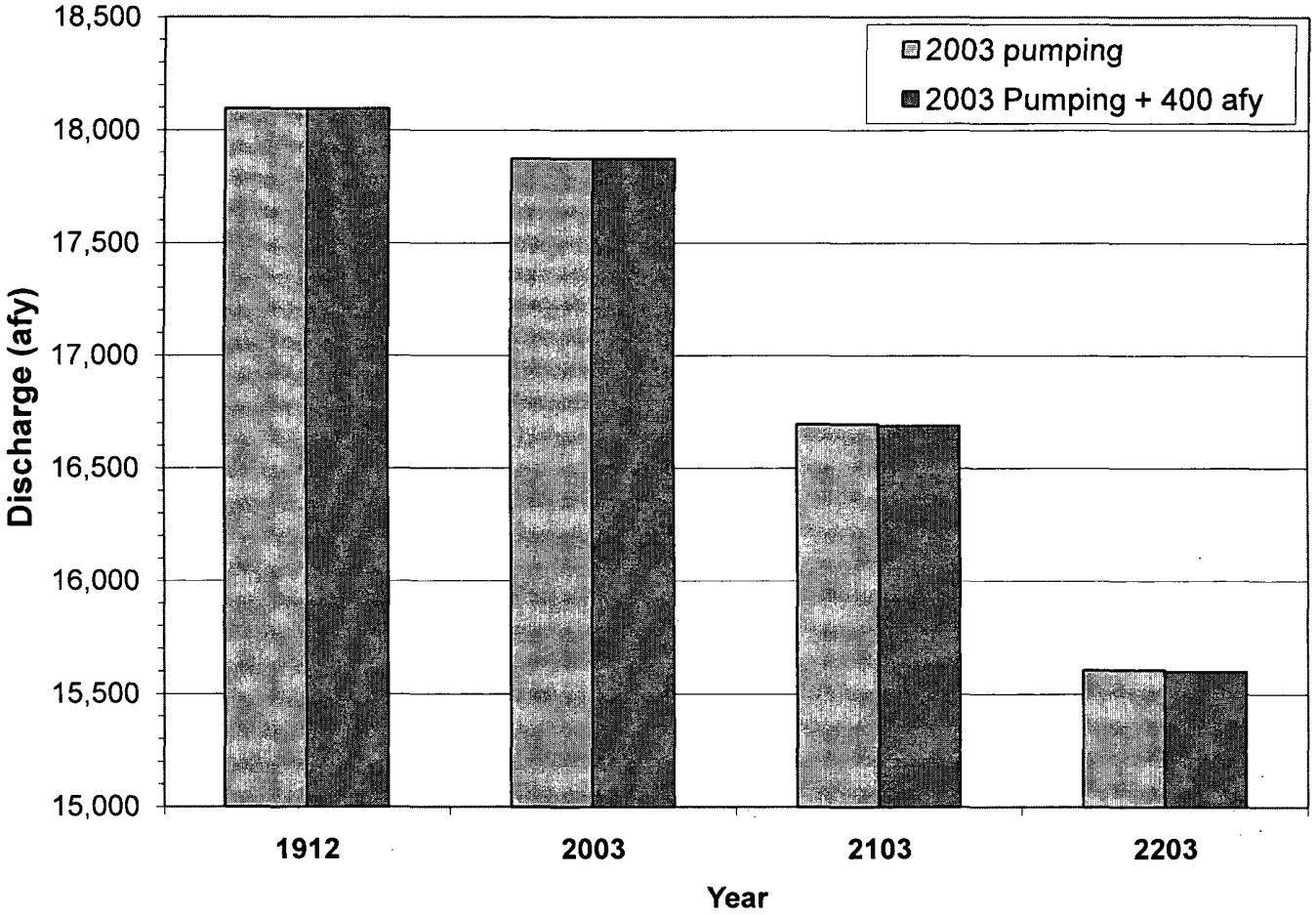
Figure 10. Comparison of the simulated effects of 2003 pumping, and 2003 pumping plus project pumping, on the discharge at Ash Meadows



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Appendix C

Authorized Right-of-Ways Within the Regional Area

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APPENDIX C – AUTHORIZED RIGHT-OF-WAYS WITHIN THE REGIONAL AREA

Serial Number	Status	Description
CACA 002784	AUTHORIZED	SOUTHERN CALIFORNIA EDISON CO - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
CACA 004178	AUTHORIZED	AMERICAN BORATE CO - ROW-WATER FACILITY - NON-ENERGY FACILITIES
CACA 007046	AUTHORIZED	BLM CAL SO - WDL-BLM-MISCELLANEOUS - NONE
CACA 026405	AUTHORIZED	VANDERBILT MINERALS - ROW-ROADS - NON-ENERGY FACILITIES
CACA 033530	AUTHORIZED	MARSH JIM - ROW-ROADS - NON-ENERGY FACILITIES
CACA 044983	AUTHORIZED	COUNTY OF INYO - ROW-OTHER-FLPMA - WATER
CARI 002570	AUTHORIZED	CA DEPT TRANSPORTATION - FED AID HIGHWAY(SEC 17) - NON-ENERGY FACILITIES
CAS 0020133	AUTHORIZED	TONOPAH & TIDEWATER RR - RR & STATIONS OUTSIDE AK - NON-ENERGY FACILITIES
NVCC 0009716	AUTHORIZED	GARNER M L - ROW-IRRIGATION FAC - NON-ENERGY FACILITIES
NVCC 0018078	AUTHORIZED	NV DEPT OF TRANS - FED AID HIGHWAY(SEC 17) - NON-ENERGY FACILITIES
NVCC 0018241	AUTHORIZED	NV DEPT OF TRANS - FED AID HIGHWAY(SEC 17) - NON-ENERGY FACILITIES
NVCC 0018267	AUTHORIZED	NV DEPT OF TRANS - FED AID HIGHWAY(SEC 17) - NON-ENERGY FACILITIES
NVCC 0018274	AUTHORIZED	NV DEPT OF TRANS - MATERIAL SITES(SEC 17) - NON-ENERGY FACILITIES
NVCC 0018275	AUTHORIZED	NV DEPT OF TRANS - MATERIAL SITES(SEC 17) - NON-ENERGY FACILITIES
NVCC 0018276	AUTHORIZED	NV DEPT OF TRANS - MATERIAL SITES(SEC 17) - NON-ENERGY FACILITIES
NVCC 0018323	AUTHORIZED	NV DEPT OF TRANS - FED AID HIGHWAY(SEC 17) - NON-ENERGY FACILITIES
NVCC 0018384	AUTHORIZED	NV DEPT OF TRANS - MATERIAL SITES(SEC 17) - NON-ENERGY FACILITIES
NVCC 0018385	AUTHORIZED	NV DEPT OF TRANS - MATERIAL SITES(SEC 17) - NON-ENERGY FACILITIES
NVCC 0018386	AUTHORIZED	NV DEPT OF TRANS - MATERIAL SITES(SEC 17) - NON-ENERGY FACILITIES
NVCC 0018387	AUTHORIZED	NV DEPT OF TRANS - MATERIAL SITES(SEC 17) - NON-ENERGY FACILITIES
NVCC 0020258	AUTHORIZED	NV DEPT OF TRANS - FED AID HIGHWAY(SEC 17) - NON-ENERGY FACILITIES
NVCC 0020518	AUTHORIZED	NV DEPT OF TRANS - FED AID HIGHWAY(SEC 17) - NON-ENERGY FACILITIES
NVCC 0021745	AUTHORIZED	NEVADA BELL - ROW-TEL & TELEG,FLPMA - NON-ENERGY FACILITIES
NVN 00000202	AUTHORIZED	NYE COUNTY - SALE- REC & PUB PURPOSES - RECREATION PURPOSES
NVN 00131801	AUTHORIZED	BEATTY WATER & SANITATION DISTRICT - SALE- REC & PUB PURPOSES - PUBLIC PURPOSES

Serial Number	Status	Description
NVN 001520	AUTHORIZED	DOE - ROW-PWR LINE 44LD513 - OTHER ENERGY FACILITIES
NVN 001614	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 00218401	AUTHORIZED	S BAPTIST CHURCH - SALE- REC & PUB PURPOSES - PUBLIC PURPOSES
NVN 002739	AUTHORIZED	THRASHER EDWARD - ROW-IRRIGATION FAC - NON-ENERGY FACILITIES
NVN 003484	AUTHORIZED	CAPPAERT ENTERPRISES - ROW-IRRIGATION FAC - NON-ENERGY FACILITIES
NVN 003819	AUTHORIZED	NV DEPT OF TRANS - MATERIAL SITES(SEC 317) - NON-ENERGY FACILITIES
NVN 004707	AUTHORIZED	NPS - ROW-PWR LINE 44LD513 - OTHER ENERGY FACILITIES
NVN 004872	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN LINE - OTHER ENERGY FACILITIES
NVN 005305	AUTHORIZED	CAPPAERT ENTERPRISES - ROW-IRRIGATION FAC - NON-ENERGY FACILITIES
NVN 005307	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 005418	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 00601802	AUTHORIZED	AMARGOSA VALLEY IMPRV - SALE- REC & PUB PURPOSES - RECREATION PURPOSES
NVN 00648001	AUTHORIZED	BEATTY WATER & SANITATION DISTRICT - SALE- REC & PUB PURPOSES - PUBLIC PURPOSES
NVN 006846	AUTHORIZED	BEATTY WATER & SANITATION DISTRICT - ROW-WATER PLANTS - NON-ENERGY FACILITIES
NVN 007315	AUTHORIZED	AMERICAN BORATE CO - ROW-WATER PLANTS - NON-ENERGY FACILITIES
NVN 007479	AUTHORIZED	FAA - ROW-ROADS FEDERAL FAC - NON-ENERGY FACILITIES
NVN 010534	AUTHORIZED	BARRICK BULLFROG INC - ROW-WATER PLANTS - NON-ENERGY FACILITIES
NVN 016589	AUTHORIZED	AMERICAN BORATE CO - ROW-WATER FACILITY - NON-ENERGY FACILITIES
NVN 017151	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 017946	AUTHORIZED	EMBRY WILLIAM D - ROW-WATER FACILITY - NON-ENERGY FACILITIES
NVN 018354	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 019973	AUTHORIZED	DOE - ROW-WATER FACILITY FED - NON-ENERGY FACILITIES
NVN 02276901	PENDING	RECORDS LON H - DESERT LAND ACT
NVN 02277001	PENDING	RECORDS JEAN M - DESERT LAND ACT
NVN 02277101	PENDING	RECORDS CHERYL L - DESERT LAND ACT
NVN 024278	PENDING	RECORDS RICHARD C - SEC 7 CLASS - NONE
NVN 02427801	PENDING	RECORDS RICHARD C - DESERT LAND ACT
NVN 029793	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES

Serial Number	Status	Description
NVN 030559	AUTHORIZED	BEATTY WATER & SANITATION DISTRICT - ROW-WATER FACILITY - NON-ENERGY FACILITIES
NVN 031120	AUTHORIZED	NYE COUNTY - ROW-ROADS - NON-ENERGY FACILITIES
NVN 033019	AUTHORIZED	AMERICAN BORATE CO - ROW-ROADS - NON-ENERGY FACILITIES
NVN 034043	AUTHORIZED	NEVADA BELL - ROW-TEL & TELEG,FLPMA - NON-ENERGY FACILITIES
NVN 035639	AUTHORIZED	NYE COUNTY - R&PP LEASE - SANITARY LANDFILLS
NVN 03563901	AUTHORIZED	NYE COUNTY - R&PP LEASE - SANITARY LANDFILLS
NVN 03563902	PENDING	NYE COUNTY - SALE- REC & PUB PURPOSES - SANITARY LANDFILLS
NVN 035976	AUTHORIZED	COST RED ENG INC - SALE- SEC 209 MIN FLPMA -
NVN 037198	AUTHORIZED	NEVADA BELL - ROW-TEL & TELEG,FLPMA - NON-ENERGY FACILITIES
NVN 037301	AUTHORIZED	NEVADA BELL - ROW-TEL & TELEG,FLPMA - NON-ENERGY FACILITIES
NVN 037511	AUTHORIZED	GS - ROW-OTHER FEDERAL FAC - NON-ENERGY FACILITIES
NVN 037616	AUTHORIZED	GS - ROW-OTHER FEDERAL FAC - NON-ENERGY FACILITIES
NVN 037728	AUTHORIZED	NEVADA BELL - ROW-TEL & TELEG,FLPMA - NON-ENERGY FACILITIES
NVN 039099	AUTHORIZED	MIELZYNSKI RAYMOND - ROW-ROADS - NON-ENERGY FACILITIES
NVN 039386	AUTHORIZED	LEWIS VERNA M - ROW-WATER FACILITY - NON-ENERGY FACILITIES
NVN 039408	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 039772	AUTHORIZED	JOHNSON NANCY E - SALE-SEC 203 & 209 FLPMA - NONE
NVN 039772	AUTHORIZED	JOHNSON RICHARD A - SALE-SEC 203 & 209 FLPMA - NONE
NVN 039862	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 039914	AUTHORIZED	BRAY LAWRENCE - ROW-ROADS - NON-ENERGY FACILITIES
NVN 039914	AUTHORIZED	BRAY LINDA - ROW-ROADS - NON-ENERGY FACILITIES
NVN 042531	AUTHORIZED	NYE COUNTY - R&PP CLASS - RECREATION PURPOSES
NVN 04253101	AUTHORIZED	NYE COUNTY - R&PP CLASS - RECREATION PURPOSES
NVN 042735	AUTHORIZED	FAA - WDL-FED AVIATION ADMIN - SUBJECT TO PRIOR RIGHTS
NVN 043044	AUTHORIZED	NYE COUNTY - ROW-ROADS UNDER RS 2477 - NON-ENERGY FACILITIES
NVN 043247	AUTHORIZED	DOE (NNSA-SC NV) - ROW-COMM SITE FED FAC - NON-ENERGY FACILITIES
NVN 043366	AUTHORIZED	ALLIED BUILDING MATERIALS - ROW-ROADS - NON-ENERGY FACILITIES
NVN 043752	AUTHORIZED	NYE COUNTY - ROW-ROADS - NON-ENERGY FACILITIES
NVN 043919	AUTHORIZED	NYE COUNTY - ROW-ROADS UNDER RS 2477 - NON-ENERGY FACILITIES
NVN 045126	AUTHORIZED	NYE COUNTY - R&PP CLASS - RECREATION PURPOSES
NVN 04512601	AUTHORIZED	NYE COUNTY - R&PP CLASS - RECREATION PURPOSES

Serial Number	Status	Description
NVN 045241	AUTHORIZED	NYE COUNTY - ROW-ROADS - NON-ENERGY FACILITIES
NVN 047001	AUTHORIZED	NYE COUNTY - ROW-ROADS - NON-ENERGY FACILITIES
NVN 047397	AUTHORIZED	NEVADA BELL - ROW-TEL & TELEG,FLPMA - FIBER OPTIC FACILITIES
NVN 047748	AUTHORIZED	DOE (OFC OF CVL RAD WST MGT) - ROW-OTHER FEDERAL FAC - NON-ENERGY FACILITIES
NVN 047766	AUTHORIZED	NYE COUNTY - SALE-SEC 203 & 209 FLPMA - NONE
NVN 048113	AUTHORIZED	MONK WILLIAM H JR - SALE-SEC 203 & 209 FLPMA - NONE
NVN 048113	AUTHORIZED	SAGE MICHAEL A - SALE-SEC 203 & 209 FLPMA - NONE
NVN 048552	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 048560	AUTHORIZED	MONK WILLIAM H JR - SALE-SEC 203 & 209 FLPMA - NONE
NVN 048560	AUTHORIZED	SAGE MICHAEL A - SALE-SEC 203 & 209 FLPMA - NONE
NVN 048561	AUTHORIZED	CATHCART H E & Z W - SALE-SEC 203 & 209 FLPMA - NONE
NVN 048562	AUTHORIZED	HANNIGAN ELI DAVID - SALE-SEC 203 & 209 FLPMA - NONE
NVN 048563	AUTHORIZED	SHINE LARRY L - SALE-SEC 203 & 209 FLPMA - NONE
NVN 048564	AUTHORIZED	DAILEY THOMAS A - SALE-SEC 203 & 209 FLPMA - NONE
NVN 048564	AUTHORIZED	DAILEY WANDA L - SALE-SEC 203 & 209 FLPMA - NONE
NVN 048565	AUTHORIZED	HANNIGAN ELI DAVID - SALE-SEC 203 & 209 FLPMA - NONE
NVN 048566	AUTHORIZED	EAVES CLIFFORD R - SALE-SEC 203 & 209 FLPMA - NONE
NVN 048566	AUTHORIZED	EAVES KATHRYN M - SALE-SEC 203 & 209 FLPMA - NONE
NVN 048567	AUTHORIZED	CLOGSTON JOHN H - SALE-SEC 203 & 209 FLPMA - NONE
NVN 048568	AUTHORIZED	CLOGSTON JOHN H - SALE-SEC 203 & 209 FLPMA - NONE
NVN 048703	AUTHORIZED	BEATTY WATER & SANITATION DISTRICT - ROW-WATER FACILITY - NON-ENERGY FACILITIES
NVN 048797	AUTHORIZED	NYE COUNTY - R&PP CLASS - RECREATION PURPOSES
NVN 048876	AUTHORIZED	BARR CHARLES M - ROW-ROADS - NON-ENERGY FACILITIES
NVN 048915	AUTHORIZED	BEATTY WATER & SANITATION DISTRICT - ROW-ROADS - NON-ENERGY FACILITIES
NVN 049529	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 049614	AUTHORIZED	BEATTY WATER & SANITATION DISTRICT - SALE-SEC 203 & 209 FLPMA - NONE
NVN 049647	AUTHORIZED	NYE COUNTY - ROW-ROADS UNDER RS 2477 - NON-ENERGY FACILITIES
NVN 049648	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 049709	AUTHORIZED	FWS - ACQ-BUR SPORT F & W
NVN 049709	AUTHORIZED	NATURE CONSERVANCY - ACQ-BUR SPORT F & W
NVN 049710	AUTHORIZED	FWS - ACQ-BUR SPORT F & W
NVN 049710	AUTHORIZED	NATURE CONSERVANCY - ACQ-BUR SPORT F & W

Serial Number	Status	Description
NVN 050038	AUTHORIZED	NEVADA BELL - ROW-TEL & TELEG,FLPMA - NON-ENERGY FACILITIES
NVN 051002	AUTHORIZED	BEATTY WATER & SANITATION DISTRICT - ROW-WATER FACILITY - NON-ENERGY FACILITIES
NVN 051039	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 051061	AUTHORIZED	VERRILLI ALBERT - ROW-ROADS - NON-ENERGY FACILITIES
NVN 051061	AUTHORIZED	VERRILLI MICHAEL - ROW-ROADS - NON-ENERGY FACILITIES
NVN 051231	AUTHORIZED	UNIVERSITY OF NV RENO - ROW-OTHER FEDERAL FAC - NON-ENERGY FACILITIES
NVN 051405	AUTHORIZED	LEWIS DELBERT T - SALE-PUBLIC LANDS-FLPMA - NONE
NVN 051405	AUTHORIZED	LEWIS VERNA M - SALE-PUBLIC LANDS-FLPMA - NONE
NVN 051406	AUTHORIZED	LEWIS DELBERT T - SALE-SEC 203 & 209 FLPMA - NONE
NVN 051406	AUTHORIZED	LEWIS VERNA M - SALE-SEC 203 & 209 FLPMA - NONE
NVN 051407	AUTHORIZED	RISINGER DONALD W - SALE-SEC 203 & 209 FLPMA - NONE
NVN 051407	AUTHORIZED	RISINGER EDITH V - SALE-SEC 203 & 209 FLPMA - NONE
NVN 051408	AUTHORIZED	RISINGER DONALD W - SALE-SEC 203 & 209 FLPMA - NONE
NVN 051408	AUTHORIZED	RISINGER EDITH V - SALE-SEC 203 & 209 FLPMA - NONE
NVN 051409	AUTHORIZED	JOHNSON NANCY E - SALE-SEC 203 & 209 FLPMA - NONE
NVN 051409	AUTHORIZED	JOHNSON RICHARD A - SALE-SEC 203 & 209 FLPMA - NONE
NVN 051410	AUTHORIZED	JOHNSON NANCY E - SALE-SEC 203 & 209 FLPMA - NONE
NVN 051410	AUTHORIZED	JOHNSON RICHARD A - SALE-SEC 203 & 209 FLPMA - NONE
NVN 051411	AUTHORIZED	JOHNSON NANCY E - SALE-SEC 203 & 209 FLPMA - NONE
NVN 051411	AUTHORIZED	JOHNSON RICHARD A - SALE-SEC 203 & 209 FLPMA - NONE
NVN 051412	AUTHORIZED	BLM - SALE-SEC 203 & 209 FLPMA - NONE
NVN 051412	AUTHORIZED	CLOGSTON JOHN H - SALE-SEC 203 & 209 FLPMA - NONE
NVN 051413	AUTHORIZED	CLOGSTON JOHN H - SALE-SEC 203 & 209 FLPMA - NONE
NVN 051414	AUTHORIZED	CLOGSTON JOHN H - SALE-SEC 203 & 209 FLPMA - NONE
NVN 051415	AUTHORIZED	CLOGSTON JOHN H - SALE-SEC 203 & 209 FLPMA - NONE
NVN 051416	AUTHORIZED	BEATTY GENERAL IMPROVEMENT DISTRICT - R&PP CLASS - RECREATION PURPOSES
NVN 05141601	AUTHORIZED	BEATTY GENERAL IMPROVEMENT DISTRICT - R AND PP LEASE - RECREATION PURPOSES
NVN 051538	AUTHORIZED	NYE COUNTY - SALE- SEC 209 MIN FLPMA - TO BE DEFINED
NVN 051544	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 051900	AUTHORIZED	NEVADA BELL - ROW-TEL & TELEG,FLPMA - NON-ENERGY FACILITIES
NVN 052412	AUTHORIZED	EAGLE WEST LLC - ROW-COMM SITE, FLPMA - NON-ENERGY FACILITIES

Serial Number	Status	Description
NVN 052438	AUTHORIZED	BEATTY TOWN ADVISORY BOARD - ROW-COMM SITE, FLPMA - NON-ENERGY FACILITIES
NVN 052458	AUTHORIZED	NYE COUNTY - SALE-SEC 203 & 209 FLPMA - NONE
NVN 052545	AUTHORIZED	NYE COUNTY SCHOOL DISTRICT - R&PP CLASS - PUBLIC PURPOSES
NVN 052571	AUTHORIZED	VANDERBILT MINERALS CORP - ROW-ROADS - NON-ENERGY FACILITIES
NVN 052811	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 052950	AUTHORIZED	BLM - ROW-OTHER FEDERAL FAC - NON-ENERGY FACILITIES
NVN 052952	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 053354	AUTHORIZED	FINCHER JAMES H - ROW-ROADS - NON-ENERGY FACILITIES
NVN 054004	AUTHORIZED	BEATTY WATER & SANITATION DISTRICT - ROW-WATER FACILITY - NON-ENERGY FACILITIES
NVN 054021	AUTHORIZED	BEATTY WATER & SANITATION DISTRICT - ROW-WATER FACILITY - NON-ENERGY FACILITIES
NVN 054086	PENDING	NYE COUNTY NUCLEAR WASTE REPOSITORY - R&PP CLASS - PUBLIC PURPOSES
NVN 05408601	PENDING	NYE COUNTY - R AND PP LEASE - PUBLIC PURPOSES
NVN 054997	AUTHORIZED	NEVADA BELL - ROW-TEL & TELEG,FLPMA - NON-ENERGY FACILITIES
NVN 056378	AUTHORIZED	BLM - ROW-OTHER FEDERAL FAC - NON-ENERGY FACILITIES
NVN 056477	AUTHORIZED	NYE COUNTY - ROW-ROADS - NON-ENERGY FACILITIES
NVN 057471	AUTHORIZED	NYE COUNTY - R&PP LEASE - SANITARY LANDFILLS
NVN 05747101	PENDING	NYE COUNTY - SALE- REC & PUB PURPOSES - SANITARY LANDFILLS
NVN 058118	AUTHORIZED	FHWA - MATERIAL SITES(SEC 317) - NON-ENERGY FACILITIES
NVN 058533	AUTHORIZED	FS - WDL-FS NATL REC AREA - SUBJECT TO PRIOR RIGHTS
NVN 059971	AUTHORIZED	BLM - SALE-SEC 203 & 209 FLPMA - NONE
NVN 059971	AUTHORIZED	MCMILLEN FLORITA - SALE-SEC 203 & 209 FLPMA - NONE
NVN 059971	AUTHORIZED	MCMILLEN FRED III - SALE-SEC 203 & 209 FLPMA - NONE
NVN 060293	AUTHORIZED	NEVADA BELL - ROW-TEL & TELEG,FLPMA - NON-ENERGY FACILITIES
NVN 060401	AUTHORIZED	NYE COUNTY - ROW-ROADS - NON-ENERGY FACILITIES
NVN 060422	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 060568	AUTHORIZED	BEATTY WATER & SANITATION DISTRICT - ROW-WATER FACILITY - NON-ENERGY FACILITIES
NVN 060825	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 060913	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 060964	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 060965	PENDING	BEATTY WATER & SANITATION DISTRICT - ROW-ROADS - NON-

Serial Number	Status	Description
		ENERGY FACILITIES
NVN 061167	AUTHORIZED	UNIVERSITY OF NV RENO - ROW-OTHER FEDERAL FAC - NON-ENERGY FACILITIES
NVN 061194	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 061276	PENDING	MARSH JIM - AIRPORT LEASES
NVN 061321	PENDING	IMV - ROW-ROADS - NON-ENERGY FACILITIES
NVN 061968FD	PENDING	BLM - EX-BLM SEC 206, FLPMA
NVN 062062	PENDING	WESTEC - PERMITS SEC 302 FLPMA - OTHER
NVN 062314	PENDING	NYE COUNTY - ROW-OTHER-FLPMA - NON-ENERGY FACILITIES
NVN 062627	AUTHORIZED	NYE COUNTY - ROW-ROADS - NON-ENERGY FACILITIES
NVN 062848	AUTHORIZED	NYE COUNTY NUC WST REPOS - ROW-WATER FACILITY - NON-ENERGY FACILITIES
NVN 062861	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 062888	AUTHORIZED	UNIVERSITY OF NV RENO - ROW-OTHER-FLPMA - NON-ENERGY FACILITIES
NVN 062946	PENDING	PONDEROSA DAIRY - ROW-WATER FACILITY - NON-ENERGY FACILITIES
NVN 063346	AUTHORIZED	DAVIS RONALD - ROW-ROADS - NON-ENERGY FACILITIES
NVN 063346	AUTHORIZED	DAVIS SHELAGH - ROW-ROADS - NON-ENERGY FACILITIES
NVN 065700FD	AUTHORIZED	BARRICK BULLFROG INC - EX-BLM SEC 206, FLPMA - NONE
NVN 065700PT	AUTHORIZED	BARRICK BULLFROG INC - EX-BLM SEC 206, FLPMA - NONE
NVN 065700PT	AUTHORIZED	BLM - EX-BLM SEC 206, FLPMA - NONE
NVN 065782	AUTHORIZED	NYE COUNTY - R&PP LEASE - SANITARY LANDFILLS
NVN 06578201	PENDING	NYE COUNTY - SALE- REC & PUB PURPOSES - SANITARY LANDFILLS
NVN 065838	PENDING	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 066239	AUTHORIZED	NYE COUNTY - SALE-SNPLMA - OTHER - NONE
NVN 06623901	AUTHORIZED	NYE COUNTY - SALE-SNPLMA - OTHER - NONE
NVN 066431	PENDING	MECCA DEVELOPMENT CO LLC - AIRPORT LEASES
NVN 066534	AUTHORIZED	BEATTY WATER & SANITATION DISTRICT - ROW-WATER FACILITY - NON-ENERGY FACILITIES
NVN 066744	AUTHORIZED	UNIVERSITY OF NV RENO - ROW-COMM SITE, FLPMA - NON-ENERGY FACILITIES
NVN 066757	AUTHORIZED	MURPHY RON - ROW-ROADS - NON-ENERGY FACILITIES
NVN 066786	AUTHORIZED	BLM - SALE-SEC 203 & 209 FLPMA - NONE
NVN 066786	AUTHORIZED	KEY JAMES RICHARD - SALE-SEC 203 & 209 FLPMA - NONE
NVN 073693	AUTHORIZED	NEVADA BELL - ROW-TEL & TELEG,FLPMA - FIBER OPTIC FACILITIES
NVN 073706	AUTHORIZED	NEVADA BELL - ROW-TEL & TELEG,FLPMA - FIBER OPTIC FACILITIES

Serial Number	Status	Description
NVN 073931	AUTHORIZED	BLM - WDL-BLM-MISCELLANEOUS - SUBJECT TO PRIOR RIGHTS
NVN 074034	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 074242	AUTHORIZED	GS - ROW-WATER FACILITY - NON-ENERGY FACILITIES
NVN 074535	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 074682	PENDING	ALLIED BUILDING MATERIALS - PERMITS SEC 302 FLPMA - NON-ENERGY FACILITIES
NVN 075207	AUTHORIZED	BARRICK BULLFROG INC - ROW-ROADS - NON-ENERGY FACILITIES
NVN 075240	AUTHORIZED	NEVADA BELL - ROW-TEL & TELEG,FLPMA - FIBER OPTIC FACILITIES
NVN 075481	AUTHORIZED	FWS - ACQ-FWS - NONEXCLUSIVE
NVN 075482	AUTHORIZED	FWS - ACQ-FWS - NONEXCLUSIVE
NVN 076426	AUTHORIZED	RINGLE EDWARD - SALE-PUBLIC LANDS-FLPMA - NONE
NVN 07652701	AUTHORIZED	NYE COUNTY - SALE- REC & PUB PURPOSES - SANITARY LANDFILLS
NVN 076533	AUTHORIZED	TURNER RANCH LLC - SALE-PUBLIC LANDS-FLPMA
NVN 076554	AUTHORIZED	BLM - ROW-OTHER FEDERAL FAC - NON-ENERGY FACILITIES
NVN 076578	AUTHORIZED	BLM - SALE-SEC 203 & 209 FLPMA - NONE
NVN 076578	AUTHORIZED	PONDEROSA DAIRY - SALE-SEC 203 & 209 FLPMA - NONE
NVN 076579	AUTHORIZED	BLM - SALE-SEC 203 & 209 FLPMA - NONE
NVN 076579	AUTHORIZED	PONDEROSA DAIRY - SALE-SEC 203 & 209 FLPMA - NONE
NVN 076865	AUTHORIZED	BLM - WDL-BLM-SPECIAL DESIGNAT - SUBJECT TO PRIOR RIGHTS
NVN 076893	AUTHORIZED	USGS - ROW-ROADS FEDERAL FAC - NON-ENERGY FACILITIES
NVN 077119	PENDING	NYE COUNTY - R&PP CLASS - SANITARY LANDFILLS
NVN 07711901	PENDING	NYE COUNTY - R AND PP LEASE - SANITARY LANDFILLS
NVN 077252	AUTHORIZED	BARRICK BULLFROG INC - ROW-WATER FACILITY - NON-ENERGY FACILITIES
NVN 077586	AUTHORIZED	DOE - ROW-OTHER-FLPMA - NON-ENERGY FACILITIES
NVN 077605	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 077880	AUTHORIZED	DOE - WDL-DEPT OF ENERGY MISC - SUBJECT TO PRIOR RIGHTS
NVN 079714	AUTHORIZED	NYE COUNTY ROAD DEPT - ROW-ROADS - NON-ENERGY FACILITIES
NVN 080657	AUTHORIZED	NYE COUNTY - ROW-ROADS - NON-ENERGY FACILITIES
NVN 080659	PENDING	TOWN OF PAHRUMP - R&PP CLASS - PUBLIC PURPOSES
NVN 08065901	PENDING	TOWN OF PAHRUMP - R AND PP LEASE - PUBLIC PURPOSES
NVN 081408	AUTHORIZED	NEVADA BELL - ROW-TEL & TELEG,FLPMA - FIBER OPTIC FACILITIES
NVN 081543	AUTHORIZED	NYE COUNTY SHERIFF - ROW-COMM SITE, FLPMA - NON-ENERGY FACILITIES
NVN 081791	PENDING	USGS - ROW-OTHER FEDERAL FAC - NON-ENERGY FACILITIES

Serial Number	Status	Description
NVN 082043	AUTHORIZED	FOSTER JERRY - ROW-ROADS - NON-ENERGY FACILITIES
NVN 082993	AUTHORIZED	FHWA - MATERIAL SITES(SEC 317) - NON-ENERGY FACILITIES
NVN 082993	AUTHORIZED	NEVADA DEPT OF TRANSPORTATION - MATERIAL SITES(SEC 317) - NON-ENERGY FACILITIES
NVN 083150	PENDING	COGENTRIX SOLAR SERVICES LLC - ROW-POWER TRAN-FLPMA - SOLAR ENERGY FACILITIES
NVN 083220	PENDING	COGENTRIX SOLAR SERVICES LLC - ROW-POWER TRAN-FLPMA - SOLAR ENERGY FACILITIES
NVN 083221	PENDING	COGENTRIX SOLAR SERVICES LLC - ROW-POWER TRAN-FLPMA - SOLAR ENERGY FACILITIES
NVN 083311	PENDING	NYE CNTY SCHOOL DISTRICT - R&PP CLASS - RECREATION PURPOSES
NVN 08331101	PENDING	NYE COUNTY SCHOOL DISTRICT - R AND PP LEASE - RECREATION PURPOSES
NVN 083312	PENDING	NYE CNTY SCHOOL DISTRICT - R&PP CLASS - RECREATION PURPOSES
NVN 08331201	PENDING	NYE COUNTY SCHOOL DISTRICT - R AND PP LEASE - RECREATION PURPOSES
NVN 084014	AUTHORIZED	DESERT FARMS INC - ROW-WATER FACILITY - NON-ENERGY FACILITIES
NVN 084067	PENDING	ALTAGAS RENEWABLE ENERGY PAC - ROW-WIND PROJ TEST - WIND ENERGY FACILITIES
NVN 084247	AUTHORIZED	NYE COUNTY PUBLIC WORKS - ROW-WATER FACILITY - NON-ENERGY FACILITIES
NVN 084284	PENDING	NYE CNTY SCHOOL DISTRICT - R&PP CLASS - RECREATION PURPOSES
NVN 08428401	PENDING	NYE COUNTY SCHOOL DISTRICT - R AND PP LEASE - RECREATION PURPOSES
NVN 084359	PENDING	SOLAR MILLENNIUM LLC - ROW-POWER TRAN-FLPMA - SOLAR ENERGY FACILITIES
NVN 084465	PENDING	PACIFIC SOLAR INVESTMENTS INC - ROW-POWER TRAN-FLPMA - SOLAR ENERGY FACILITIES
NVN 084466	PENDING	PACIFIC SOLAR INVESTMENTS INC - ROW-POWER TRAN-FLPMA - SOLAR ENERGY FACILITIES
NVN 084614	PENDING	DIANA HARTZELL - ROW-ROADS - NON-ENERGY FACILITIES
NVN 084704	PENDING	AMARGOSA FLATS ENERGY LLC - ROW-POWER TRAN-FLPMA - SOLAR ENERGY FACILITIES
NVN 085009	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 085201	PENDING	EWINDFARM INC - ROW-POWER TRAN-FLPMA - SOLAR ENERGY FACILITIES
NVN 085746	PENDING	DESERT RESEARCH INSTITUTE - ROW-POWER TRAN-FLPMA - WIND ENERGY FACILITIES
NVN 086217	PENDING	NYE COUNTY SOLAR I, LLC - ROW-POWER TRAN-FLPMA - SOLAR ENERGY FACILITIES
NVN 086234	PENDING	DOE - ROW-COMM SITE FED FAC - NON-ENERGY FACILITIES
NVN 086246	PENDING	AUSRA NV 1 LLC - ROW-POWER TRAN-FLPMA - SOLAR ENERGY FACILITIES
NVN 086279	PENDING	DOE - ROW-PWR LINE FED FAC - OTHER ENERGY FACILITIES

Serial Number	Status	Description
NVN 086295	PENDING	BLM - SALE-SNPLMA - GENERAL - NONE
NVN 086296	PENDING	BLM - SALE-SNPLMA - GENERAL - NONE
NVN 086297	PENDING	BLM - SALE-SNPLMA - GENERAL - NONE
NVN 086298	PENDING	BLM - SALE-SNPLMA - GENERAL - NONE
NVN 086299	PENDING	BLM - SALE-SNPLMA - GENERAL - NONE
NVN 086571	PENDING	ABENGOA SOLAR INC - ROW-POWER TRAN-FLPMA - SOLAR ENERGY FACILITIES
NVN 086612	AUTHORIZED	UNIVERSITY OF NEVADA LAS VEGAS - ROW-OTHER-FLPMA - NON-ENERGY FACILITIES
NVN 086787	AUTHORIZED	AMERICAN LAND CONSERVANCY - ACQ-FWS - NONE
NVN 086787	AUTHORIZED	FWS - ACQ-FWS - NONE
NVN 086788	AUTHORIZED	FWS - ACQ-FWS - NONE
NVN 086788	AUTHORIZED	KOZAL MARY V - ACQ-FWS - NONE
NVN 086788	AUTHORIZED	KOZAL VICTOR - ACQ-FWS - NONE
NVN 087313	AUTHORIZED	PACIFIC SOLAR INVESTMENTS INC - PERMITS SEC 302 FLPMA - SOLAR ENERGY FACILITIES
NVN 087440	PENDING	BLM - ROW-COMM SITE, FLPMA - NON-ENERGY FACILITIES
NVN 087804	PENDING	BEATTY WATER & SANITATION DISTRICT - ROW-WATER FACILITY - NON-ENERGY FACILITIES
NVN 087838	PENDING	BEATTY WATER & SANITATION DISTRICT - PERMITS SEC 302 FLPMA - NON-ENERGY FACILITIES
NVN 0042808	AUTHORIZED	NV DEPT OF TRANS - ROW-FS FED AID HWYSEC317 - NON-ENERGY FACILITIES
NVN 0042814	AUTHORIZED	NV DEPT OF TRANS - MATERIAL SITES(SEC 107) - NON-ENERGY FACILITIES
NVN 0043305	AUTHORIZED	NV DEPT OF TRANS - MATERIAL SITES(SEC 17) - NON-ENERGY FACILITIES
NVN 0043306	AUTHORIZED	NV DEPT OF TRANS - FED AID HIGHWAY(SEC 17) - NON-ENERGY FACILITIES
NVN 0044010	AUTHORIZED	DOE - ROW-ROADS FED 44LD513 - NON-ENERGY FACILITIES
NVN 0045108	AUTHORIZED	FAA - WDL-FED AVIATION ADMIN - SUBJECT TO PRIOR RIGHTS
NVN 0045546	AUTHORIZED	NV POWER CO - ROW-ISSUED BY AEC - OTHER ENERGY FACILITIES
NVN 0045845	AUTHORIZED	NV POWER CO - ROW-POWER TRAN LINE - OTHER ENERGY FACILITIES
NVN 0046490	AUTHORIZED	NV DEPT OF TRANS - MATERIAL SITES(SEC 17) - NON-ENERGY FACILITIES
NVN 0046516	AUTHORIZED	NV DEPT OF TRANS - MATERIAL SITES(SEC 17) - NON-ENERGY FACILITIES
NVN 0048083	AUTHORIZED	GS - ROW-WATER FAC44LD513 - NON-ENERGY FACILITIES
NVN 0049847	AUTHORIZED	BLM - SMALL TRACT CLASS - SUBJECT TO PRIOR RIGHTS
NVN 0054659	AUTHORIZED	PETERSON MERRILL H - ROW-IRRIGATION FAC - NON-ENERGY FACILITIES
NVN 0054920	AUTHORIZED	RHYOLITE CITY OF - ROW-WATER PLANTS - NON-ENERGY FACILITIES

Serial Number	Status	Description
NVN 0054920	AUTHORIZED	SPENCER JAMES J - ROW-WATER PLANTS - NON-ENERGY FACILITIES
NVN 0057586	AUTHORIZED	NV POWER CO - ROW-PWR FACILITIES - OTHER ENERGY FACILITIES
NVN 0057750	AUTHORIZED	NV DIVISION OF STATE LANDS - R&PP CLASS - SANITARY LNDFIL/HAZRDOUS
NVN 005775001	AUTHORIZED	NV DIVISION OF STATE LANDS - R AND PP LEASE - SANITARY LNDFIL/HAZRDOUS
NVN 0058116	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-PWR FACILITIES - OTHER ENERGY FACILITIES
NVN 0058190	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-PWR FACILITIES - OTHER ENERGY FACILITIES
NVN 0058398	AUTHORIZED	NV DEPT OF TRANS - FED AID HIGHWAY(SEC 317) - NON-ENERGY FACILITIES
NVN 0058536	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-PWR FACILITIES - OTHER ENERGY FACILITIES
NVN 0059062	AUTHORIZED	NV DEPT OF TRANS - MATERIAL SITES(SEC 317) - NON-ENERGY FACILITIES
NVN 0059100	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES
NVN 0059432	AUTHORIZED	NEVADA BELL - ROW-TELEPHONE-TELEGRAPH 4 - NON-ENERGY FACILITIES
NVN 0064693	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-PWR FACILITIES - OTHER ENERGY FACILITIES
NVN 0065139	AUTHORIZED	NEVADA BELL - ROW-TELEPHONE-TELEGRAPH 4 - NON-ENERGY FACILITIES
NVN 0065209	AUTHORIZED	NEVADA BELL - ROW-TELEPHONE-TELEGRAPH 4 - FIBER OPTIC FACILITIES
NVN 0065893	AUTHORIZED	NV DEPT OF TRANS - MATERIAL SITES(SEC 17) - NON-ENERGY FACILITIES
NVN 0065993	AUTHORIZED	NV DEPT OF TRANS - FED AID HIGHWAY(SEC 317) - NON-ENERGY FACILITIES
NVN 0066111	AUTHORIZED	AMERICAN TOWER CORP - ROW-COMM SITE, 1911 - NON-ENERGY FACILITIES
NVN 0066267	AUTHORIZED	NV DEPT OF TRANS - MATERIAL SITES(SEC 317) - NON-ENERGY FACILITIES
NVN 0066289	AUTHORIZED	VALLEY ELECTRIC ASSOCIATION - ROW-POWER TRAN-FLPMA - OTHER ENERGY FACILITIES

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Appendix D

Key Observation Point Worksheets

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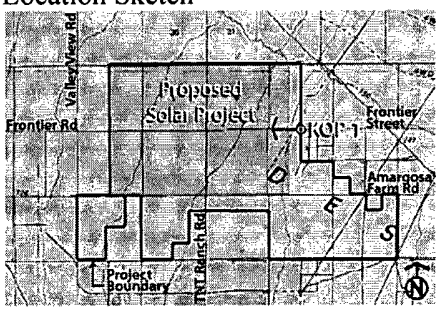
VISUAL CONTRAST RATING WORKSHEET

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

Project Name:	**Location**	Location Sketch
Amargosa Farm Road Solar Project	Township 16S	
Key Observation Point : 1	Range 49E	
Sandy Lane	Section 8	
VRM Class: IV		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal (foreground) Triangular (background)	Low to tall (foreground) Low (mid to background)	Geometric, rectilinear (foreground) linear, Vertical (mid-ground)
Line	Horizontal (foreground) Jagged and diagonal (background)	Regular, vertical (foreground) Regular, horizontal (mid ground)	Vertical (mid-ground)
Color	Tan (foreground) Brown and dark brown (background)	Dark greens and browns	Brown
Texture	Fine (foreground) Coarse (background)	Coarse (foreground) Fine (mid and background)	Fine (background)

Proposed Activity Description (Facility)

Facilities – Transmission Lines (tl), Solar Fields (sf), Power Block (pb), and Wind Fence (wf)

	Landform/Water	Vegetation	Structures
Form	Flat (sf) (foreground)	Geometric from clearing (sf) (foreground)	Linear (tl), linear, rectangular (sf, wf), tall, cylindrical (pb) (foreground)
Line	Horizontal, linear (sf), foreground)	Regular, linear (sf) (foreground)	Linear (sf, tl, wf) vertical (pb) (foreground)
Color	Tan (sf) (foreground)	Green (foreground)	Silver-blue, shiny (sf) tan/brown (pb, wf) (foreground)
Texture	Fine (foreground)	Coarse (foreground)	Fine to medium (foreground/background)

Degree of Contrast

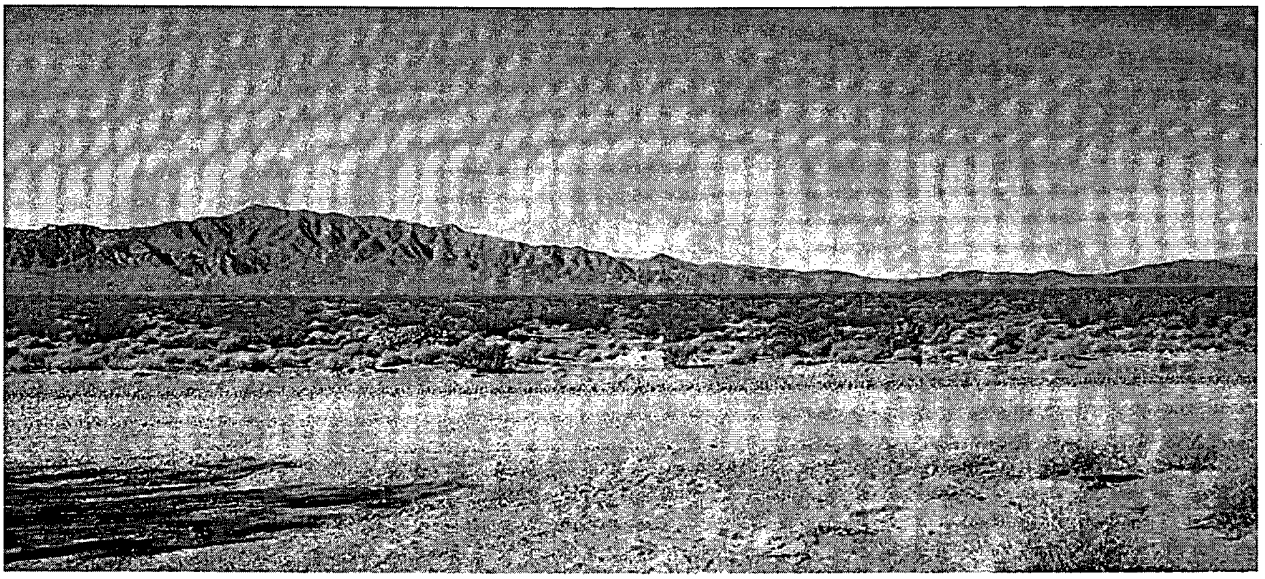
Degree of Contrast		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form			X			X			X			
	Line			X			X			X			
	Color			X				X		X			
	Texture			X			X				X		

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
See Chapter 4 - Mitigation

Evaluators Names:
Conrad Langley, Marc Schwartz

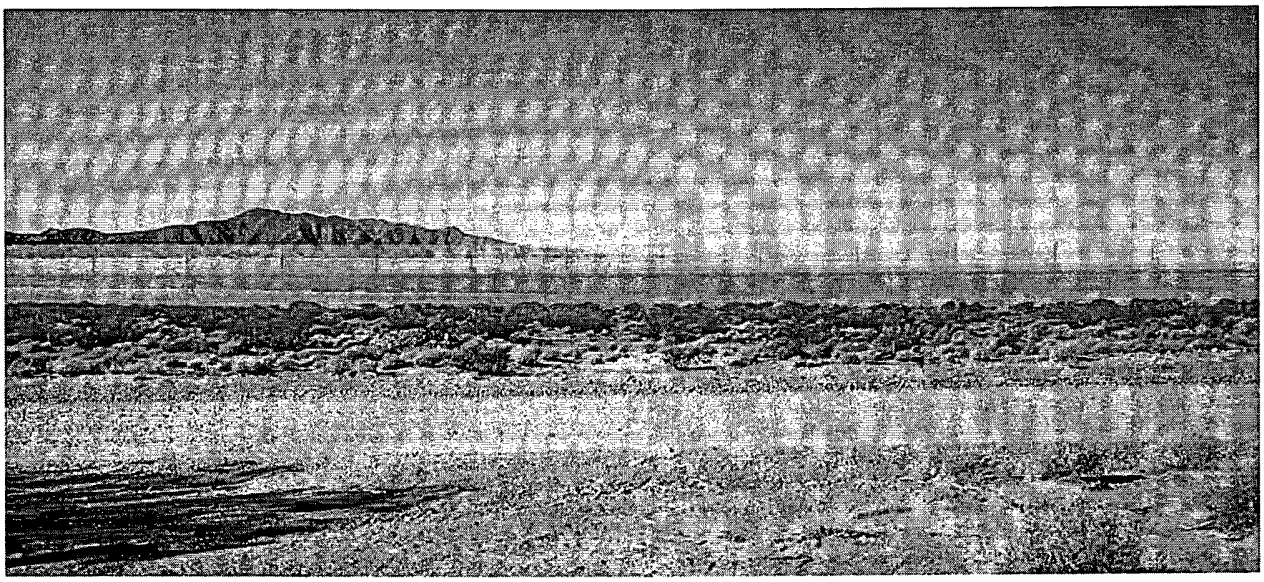
Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities



KOP 1 – View facing west from Sandy Lane residence

Moderate/ Strong contrast would result from construction and operation of the proposed project with naturalistic project setting designated as VRM Class IV. The construction of the project would result in substantial grading and the clearing of vegetation with a moderate contrast resulting from vegetation removal. The proposed project structures would be seen from KOP 1 at a distance of approximately 700 feet and would be seen from a level viewing position with the dominant view being of the proposed semi-transparent wind fence, the first row of solar collectors and potentially the tops of power block components (at a distance of .75 mile). As viewed from KOP 1, the site topography descends towards the southwest helping minimize the impacts of the taller power-block elements such as the cooling tower and the salt storage tanks. Overall impacts are anticipated to be high.

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities



Simulated Condition 1 – View facing west from Sandy Lane residence
Refer to Figure 4-11 AB for simulation parameters

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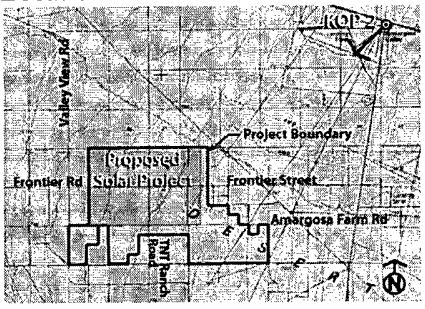
VISUAL CONTRAST RATING WORKSHEET

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

Project Name:	**Location**	Location Sketch
Amargosa Farm Road Solar Project		
Key Observation Point : 2	Township 15S	
Lathrop Wells Rest Area	Range 50E	
VRM Class: IV	Section 18	



Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Horizontal (foreground) Triangular, Irregular (background)	Low, horizontal (foreground and mid-ground)	Linear, geometric (foreground to mid-ground)
Line	Horizontal (foreground) Undulating (background)	Regular (foreground to background)	Vertical, diagonal (foreground) Horizontal (mid-ground)
Color	Tan (foreground and mid-ground) Dark Brown/brown (background)	Browns, Dark green (foreground to mid-ground)	Grey, brown (foreground)
Texture	Fine (foreground) Coarse (background)	Fine to (foreground) Fine (mid and background)	Regular, fine (foreground to mid-ground)

Proposed Activity Description (Facility)

Facilities – Transmission Lines (tl), Solar Fields (sf), and Power Block (pb)

	Landform/Water	Vegetation	Structures
Form	Not Visible	Not Visible	Linear (tl), linear, rectangular (sf), tall, cylindrical (pb) (Mid-ground)
Line	Not Visible)	Not Visible	Linear (sf, tl) vertical (pb) (mid-ground)
Color	Not Visible	Not Visible	Silver-blue, shiny (sf) tan/brown (pb) (mid-ground)
Texture	Not Visible	Not Visible	Fine (sf, tl) medium (pb) (mid-ground/background)

Degree of Contrast

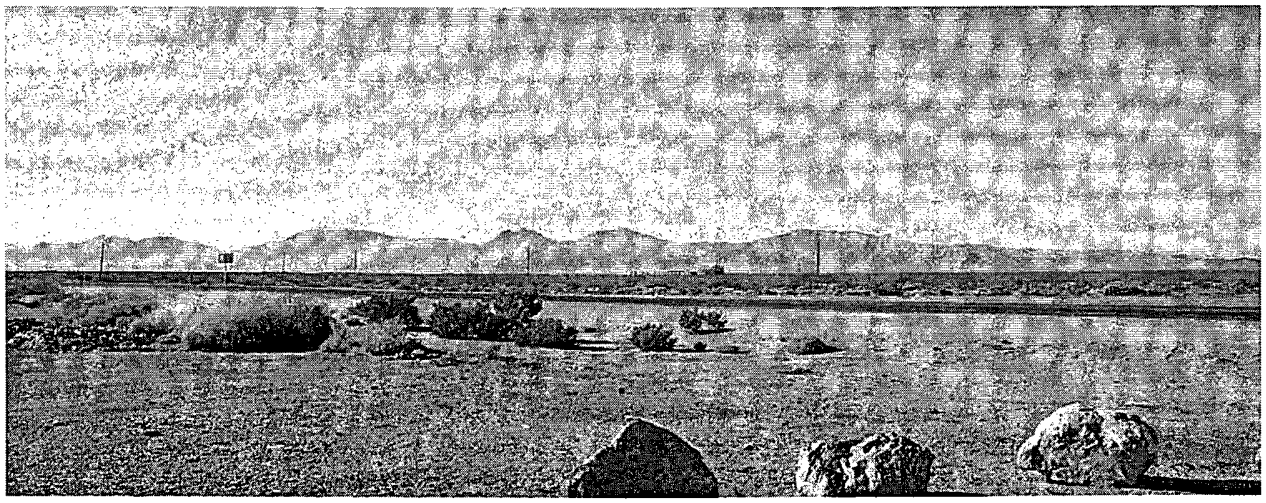
Degree of Contrast		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form			X					X		X		
	Line				X			X				X	
	Color				X				X			X	
	Texture				X				X			X	

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
See Chapter 4 - Mitigation

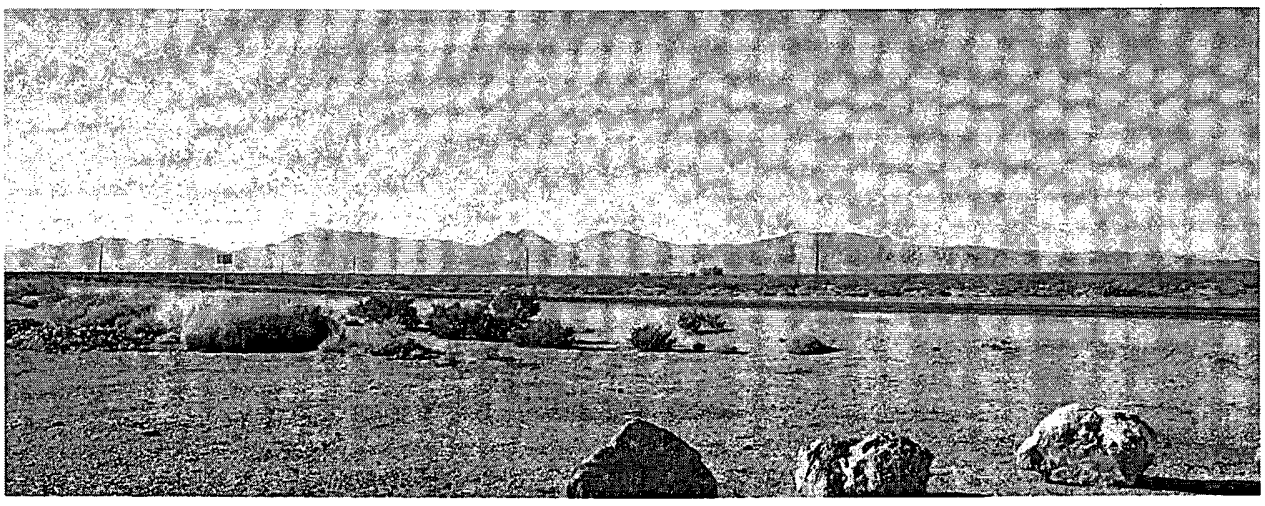
Evaluators Names:
Conrad Langley, Marc Schwartz

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities



KOP 2 - View facing southwest from Lathrop Wells rest area

Weak contrast would result from construction and operation of the proposed project with modified project setting designated as VRM Class IV. The construction of the project would result in substantial grading and the clearing of vegetation, but is unlikely that the contrast of modifications to landform and vegetation would be seen from KOP 2. The proposed project powerblock structures (i.e. dry cooling unit and salt-storage tanks) would be partially screened from KOP 2 at a distance of approximately 6 miles and would be seen from a level viewing position with backdropped views, further reducing the overall perceived impacts. Overall Impacts are anticipated to be low.

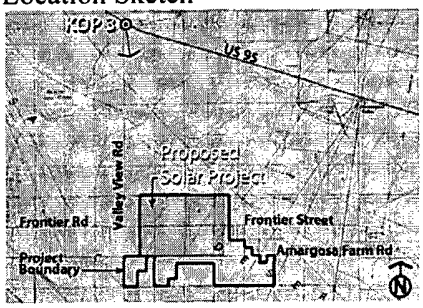


Simulated Condition 2 - View facing southwest from Lathrop Wells rest area
Refer to Figure 4-8 AB for simulation parameters

VISUAL CONTRAST RATING WORKSHEET

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

Project Name:	**Location**	Location Sketch
Amargosa Farm Road Solar Project		
Key Observation Point : 3	Township 15S	
East Bound US 95	Range 48E	
VRM Class: IV	Section 2	



Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Horizontal (foreground) Triangular, Irregular (background)	Low, horizontal (foreground and mid-ground)	Linear, geometric (foreground to mid-ground)
Line	Horizontal (foreground) Undulating (background)	Regular (foreground to background)	Vertical, diagonal (foreground) Horizontal (mid-ground)
Color	Tan (foreground and mid-ground) Dark Brown/brown (background)	Browns, green (foreground to background)	Grey, brown (foreground)
Texture	Fine (foreground) Mid to Coarse (background)	Fine (foreground to background)	Regular, fine (foreground to mid-ground)

Proposed Activity Description (Facility)

Facilities – Transmission Lines (tl), Solar Fields (sf), and Power Block (pb)

	Landform/Water	Vegetation	Structures
Form	Flat, Horizontal (sf) (mid-ground)	Geometric from clearing (sf) (mid-ground)	Linear (tl), linear, rectangular (sf), tall, cylindrical (pb) (mid-ground)
Line	Horizontal, linear (sf), (mid-ground)	Regular, linear (sf) (mid-ground)	Linear (sf, tl) vertical and rectangular (pb) (mid-ground)
Color	Not Visible	Green/brown (mid-ground)	Silver-blue, shiny (sf) tan/brown (pb) (mid-ground)
Texture	Not Visible	Fine (mid-ground)	Fine (sf, tl) medium (pb) (mid-ground/background)

Degree of Contrast

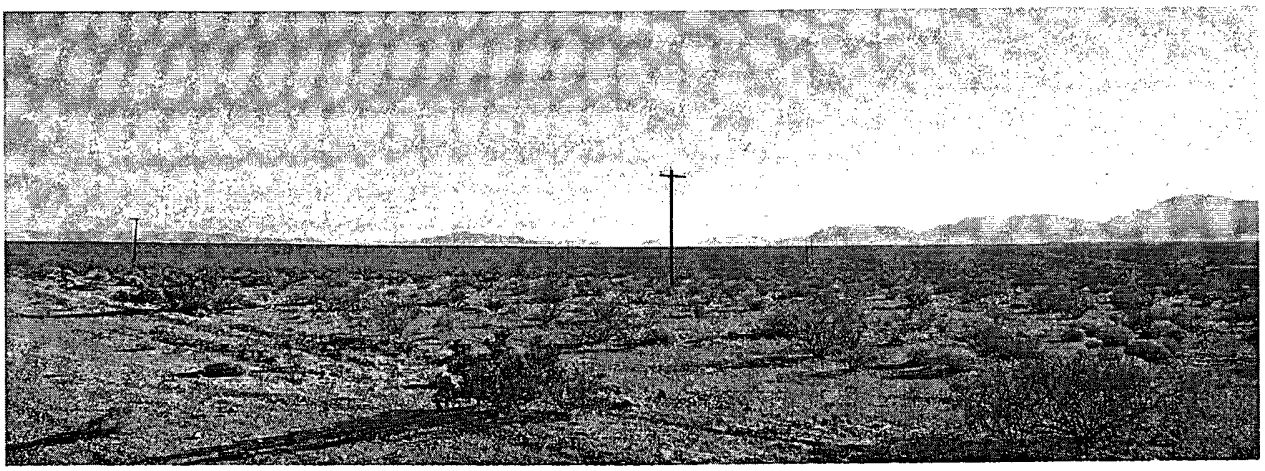
Degree of Contrast		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form			X			X				X		
	Line			X				X			X		
	Color			X				X			X		
	Texture			X				X				X	

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
Refer to Chapter 4 – Mitigation Measures

Evaluators Names:
Conrad Langley, Marc Schwartz

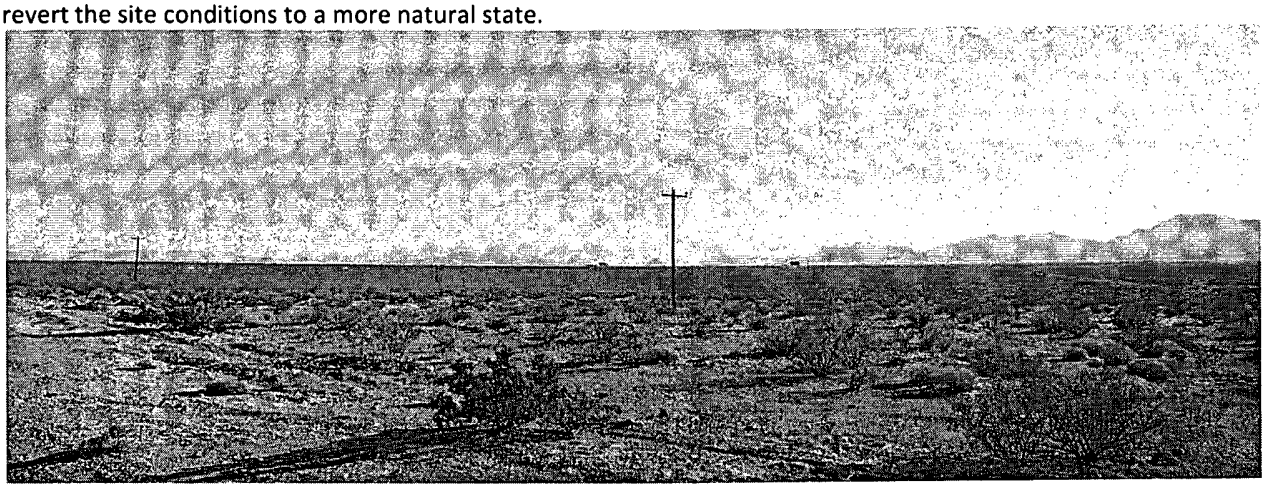
Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities



KOP 3 – View facing south from US95

Weak/Moderate contrast would result from construction and operation of the proposed project with a naturalistic project setting designated as VRM Class IV. The construction of the project would result in substantial grading and the clearing of vegetation, but is unlikely that the contrast of modifications to landform and vegetation will result in increased project contrast from this KOP. The proposed project structures would be seen from KOP 3 at a distance of approximately 5 ½ miles and would be seen from a level viewing position. Project components expected to be seen are the powerblock (i.e. dry cooling unit, salt storage tanks) that are rectangular and geometric in form and hard-edged lines. The solar troughs would be seen as a thin low, continuous line that sits on the horizon line. Overall impacts are anticipated to be moderate/low.

For the duration of construction, a temporary construction access road would be built from US 95 to the northern project boundary. During this construction phase, overall contrast would raise to a moderate impact due to the low, partially blocked nature of the construction road. Post-construction restoration efforts are anticipated to revert the site conditions to a more natural state.

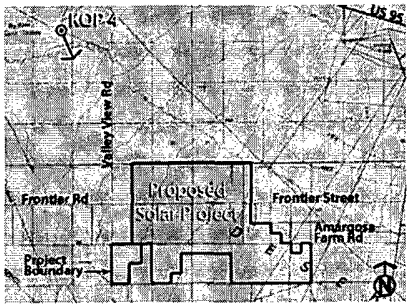


Simulated Condition 3 - View facing south from US95
Refer to Figure 4-7 AB for simulation parameters

VISUAL CONTRAST RATING WORKSHEET

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

Project Name:	**Location**	Location Sketch
Amargosa Farm Road Solar Project		
Key Observation Point : 4	Township 15S	
Big Dune	Range 48E	
VRM Class: IV	Section 16	



Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Horizontal (foreground) Irregular (background)	Low, horizontal (foreground and mid-ground)	N/A
Line	Horizontal (foreground) Undulating (background)	Regular (foreground to background)	N/A
Color	Tan (foreground and mid-ground) Dark Brown/brown (background)	Brown/Dark green (mid-ground)	N/A
Texture	Fine (foreground) Coarse (background)	Patchy, Coarse (foreground) Fine (mid and background)	N/A

Proposed Activity Description (Facility)

Facilities – Transmission Lines (tl), Solar Fields (sf), and Power Block (pb)

	Landform/Water	Vegetation	Structures
Form	Flat, Horizontal (sf) (mid-ground)	Geometric from clearing (sf) (mid-ground)	Linear (tl), linear, rectangular (sf), tall, cylindrical (pb) (mid-ground)
Line	Horizontal, linear (sf), (mid-ground)	Regular, linear (sf) (mid-ground)	Linear (sf, tl) vertical (pb) (mid-ground)
Color	Not Visible	Green/brown (mid-ground)	Silver-blue, shiny (sf) tan/brown (pb) (mid-ground)
Texture	Not Visible	Fine (mid-ground)	Fine (sf, tl) medium (pb) (mid-ground/background)

Degree of Contrast

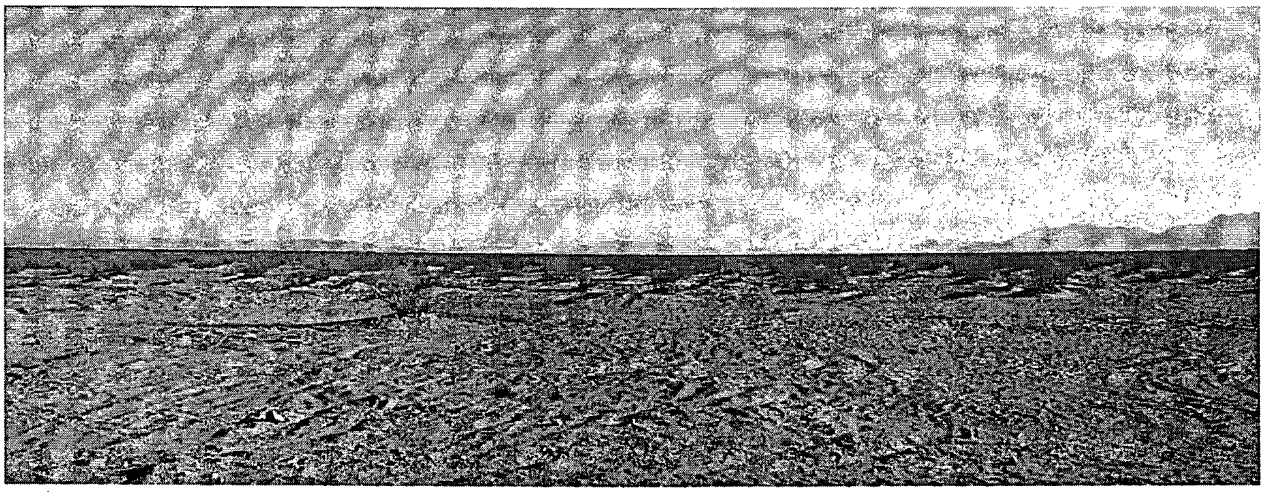
Degree of Contrast		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X			X			X		
	Line				X			X			X		
	Color				X				X			X	
	Texture				X				X			X	

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
See Chapter 4 - Mitigation

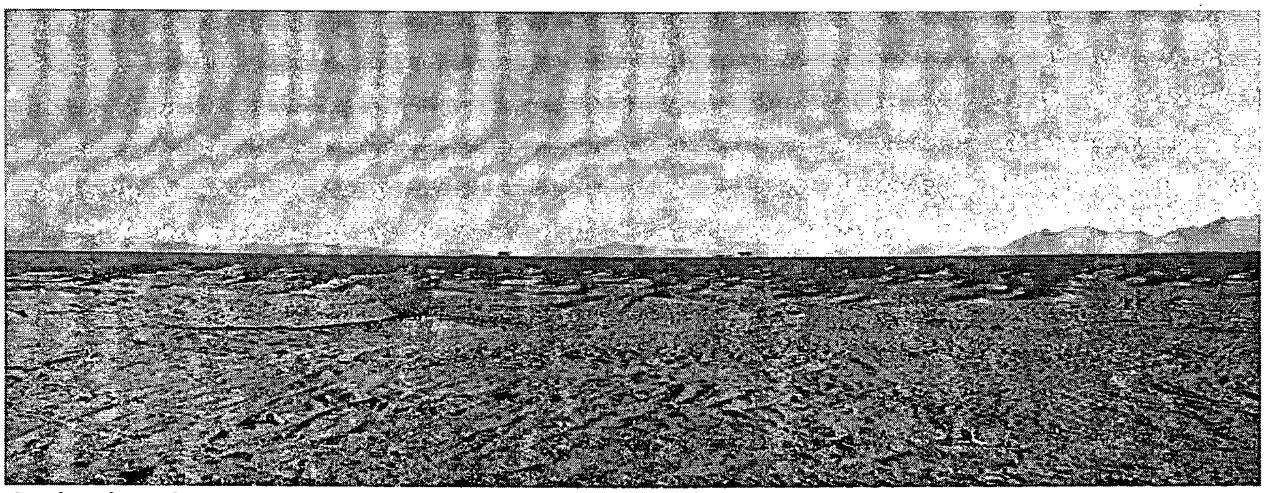
Evaluators Names:
Conrad Langley, Marc Schwartz

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities



KOP 4 – view facing southeast from Big Dune Recreation Area

Weak / Moderate contrast would result from the construction and operation of the proposed project within a naturalistic setting. The construction of the project would result in substantial grading and the clearing of vegetation, but is unlikely that the contrast of modifications to landform and vegetation would be seen from KOP 4. The proposed project structures will be seen from KOP 4 at a distance of approximately 3.75 miles and would be seen from a level viewing position, further reducing the overall perceived impacts. Project components expected to be seen are the powerblock (i.e. dry cooling unit, salt storage tanks) that are rectangular and geometric in form and hard-edged lines. The solar troughs would be seen as a thin low, continuous line that sits on the horizon line. Overall impacts are anticipated to be moderate/low.

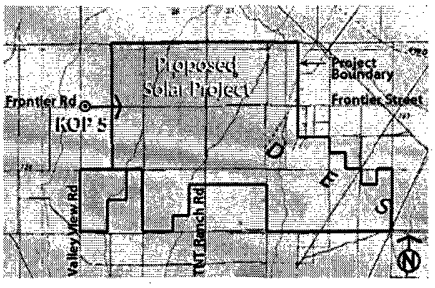


Simulated Condition 4 – view facing southeast from Big Dune Recreation Area
Refer to Figure 4-9 AB for simulation parameters

VISUAL CONTRAST RATING WORKSHEET

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

Project Name:	**Location**	Location Sketch
Amargosa Farm Road Solar Project		
Key Observation Point : 5	Township 16S	
Valley View Road	Range 49E	
VRM Class: IV	Section 11	



Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, Horizontal (foreground) Irregular (background)	Low, horizontal (foreground and mid-ground)	Linear, Vertical (poles)
Line	Horizontal (foreground) Undulating (background)	Regular (foreground to background)	vertical
Color	Tan (foreground and mid-ground) Dark Brown/brown (background)	Brown/Dark green (mid-ground)	brown
Texture	Fine (foreground and mid-ground) Coarse (background)	Patchy, Coarse (foreground) Fine (mid and background)	Fine, regular

Proposed Activity Description (Facility)

Facilities – Transmission Lines (tl), Solar Fields (sf), Power Block (pb), and Wind Fence (wf)

	Landform/Water	Vegetation	Structures
Form	Flat, Horizontal (sf)	Geometric from clearing (sf) (foreground)	Linear (tl), linear, rectangular (sf, wf), tall, geometric, rectangular, (pb) (foreground)
Line	Horizontal, linear (sf)	Regular, linear (sf)	Linear (sf, tl, wf) vertical (pb) (foreground)
Color	Light brown	Green/brown	Silver-blue, shiny (sf) tan/brown (pb, wf) (foreground)
Texture	Fine	Fine	Fine (sf, tl, wf) medium (pb) (foreground to background)

Degree of Contrast

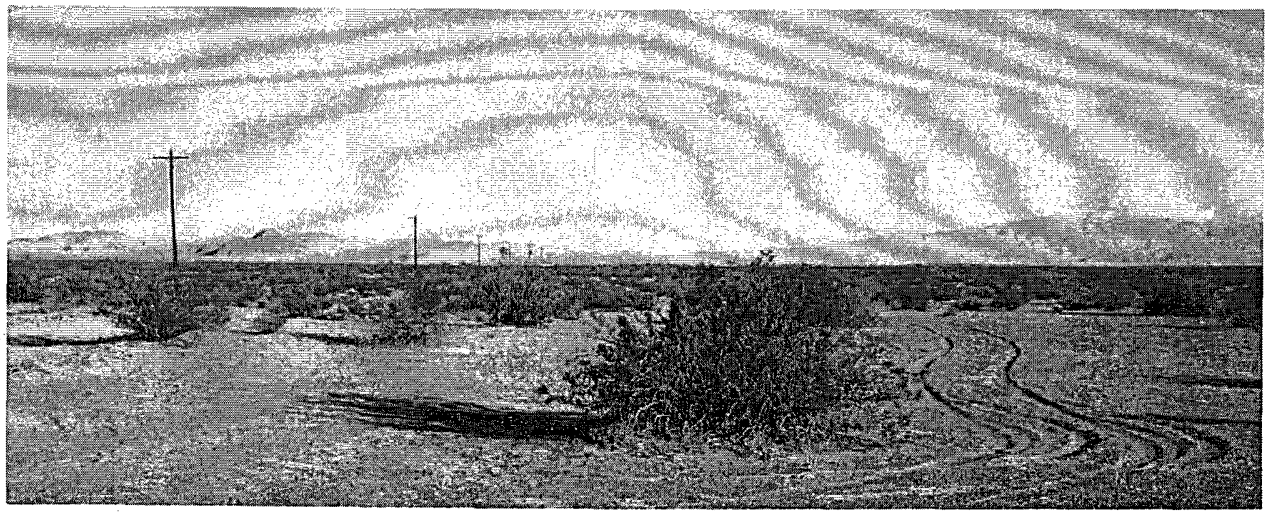
Degree of Contrast		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form	X				X				X			
	Line	X					X			X			
	Color		X				X			X			
	Texture		X				X				X		

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
See Chapter 4 - Mitigation

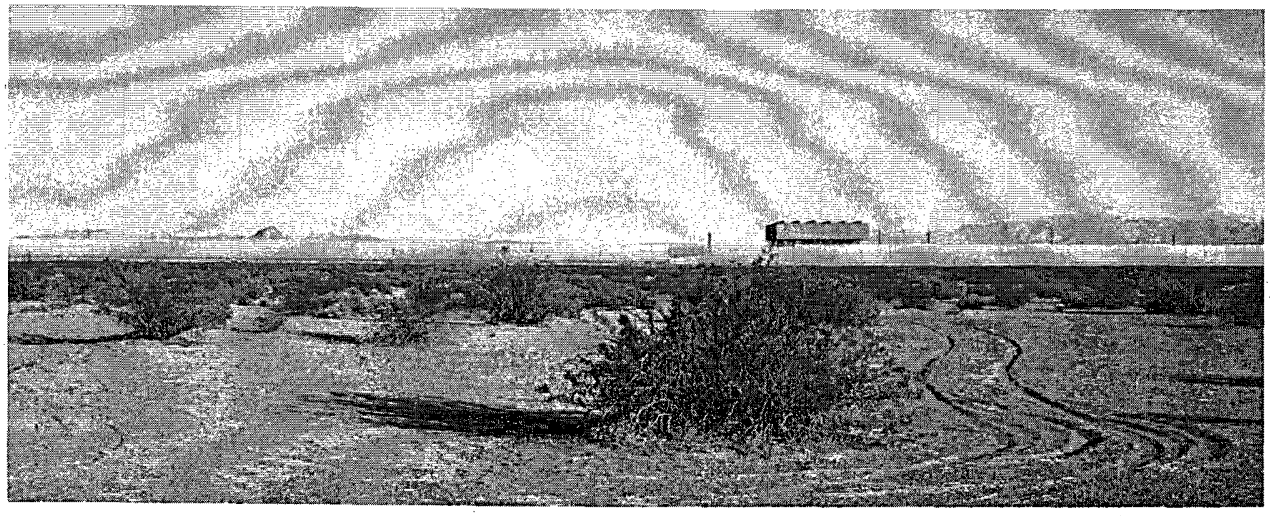
Evaluators Names:
Conrad Langley, Marc Schwartz

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities



KOP 5 – View facing west from Valley View Estates

Moderate / strong contrast would result from construction and operation of the proposed project with naturalistic project setting designated as VRM Class IV. The construction of the project would result in substantial grading and the clearing of vegetation with moderate contrast resulting from vegetation removal. The proposed project structures would be seen from KOP 5 at a distance of a 1/4 mile and would be seen from a level viewing position with the dominant view being of the proposed semi-transparent wind fence, the first row of solar collectors and the upper parts of the power block components (at a distance of .75 miles). Overall impacts are anticipated to be high.

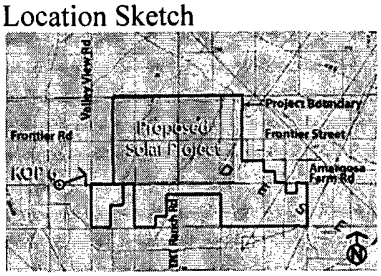


Simulated Condition 5 – View facing west from Valley View Estates
Refer to Figure 4-10 AB for simulation parameters

VISUAL CONTRAST RATING WORKSHEET

District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

Project Name:	**Location**	Location Sketch
Amargosa Farm Road Solar Project		
Key Observation Point : 6	Township 16S	
Amargosa Farm Road	Range 48E	
VRM Class: IV	Section 15	



Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal (foreground) Irregular (background)	Low, horizontal (foreground and mid-ground)	Linear, narrow, vertical (poles)
Line	Horizontal (foreground) Undulating, jagged (background)	Regular (foreground to background)	vertical
Color	Tan (foreground and mid-ground) Dark Brown/brown, tan (background)	Green, Pale yellow (foreground) Brown/Dark green (mid-ground)	brown
Texture	Fine (foreground and mid-ground) Coarse (background)	Patchy, Coarse (foreground) Fine (mid and background)	Fine, regular

Proposed Activity Description (Facility)

Facilities – Transmission Lines (tl), Solar Fields (sf), and Power Block (pb)

	Landform/Water	Vegetation	Structures
Form	Flat, Horizontal (sf) (mid-ground)	Geometric from clearing (sf) (mid-ground)	Linear, rectangular (sf) (foreground), Linear (tl), tall, geometric, cylindrical (pb) (mid-ground)
Line	Horizontal, linear (sf), (mid-ground)	Regular, linear (sf) (mid-ground)	Linear, horizontal (sf, tl, fence), rectangular, vertical (pb) (foreground)
Color	Light brown	Green/brown (mid-ground)	Silver-blue, shiny (sf) tan/brown (pb) (foreground)
Texture	Fine	Fine (mid-ground)	Fine (sf, tl) medium (pb) (foreground to background)

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X		X			X			
	Line				X		X			X			
	Color			X				X		X			
	Texture			X				X			X		

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
See Chapter 4 - Mitigation

Evaluators Names:
Conrad Langley, Marc Schwartz

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

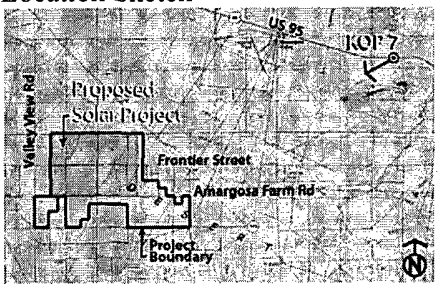
KOP 6 – view facing east-northeast from Amargosa Farm Road

Moderate / strong contrast would result from construction and operation of the proposed project with naturalistic/pastoral project setting designated as VRM Class IV. The construction of the project will result in substantial grading and the clearing of vegetation, however only resulting with weak contrast from this KOP. The proposed project structures would be seen from KOP 6 at a distance of approximately 1.25 miles and would be seen from a level viewing position with the dominant view being of the proposed project wind fence, the first row of solar collectors, and tops of power block components.

The 250 foot Amargosa Farm Road realignment would be most evident from this KOP with project components (assembly hall, switchyard, administrative building, and drainage/detention structures) being situated on the south side of the re-aligned road. Dense vegetative screening from the residential areas would reduce perceived impacts to proposed facilities located on the south side of Amargosa Farm Road. These project components would increase the project contrast, thus increasing the overall impacts for travelers as they move west to east towards the project. Overall impacts are anticipated to be moderate/high.

VISUAL CONTRAST RATING WORKSHEET

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

Project Name:	**Location**	Location Sketch
Amargosa Farm Road Solar Project	Township 15S	
Key Observation Point : 7	Range 50E	
West Bound 95	Section 22	
VRM Class: IV		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Horizontal (foreground) Triangular, Irregular (background)	Low, horizontal (foreground and mid-ground)	Linear, geometric (foreground to mid-ground)
Line	Horizontal (foreground) Undulating, irregular (background)	Regular (foreground to background)	Diagonal (foreground to Mid-ground)
Color	Tan (foreground and mid-ground) Dark Brown/brown (background)	Browns, green, reddish-browns (foreground to background)	Grey (foreground)
Texture	Fine (foreground) Mid to Coarse (background)	Fine (foreground to background)	Regular, fine (foreground to mid-ground)

Proposed Activity Description (Facility)

Facilities – Transmission Lines (tl), Solar Fields (sf), and Power Block (pb)

	Landform/Water	Vegetation	Structures
Form	Flat, Horizontal (sf) (Mid-ground)	Geometric from clearing (sf) (background)	Linear (tl), linear, rectangular (sf), geometric (pb) (background)
Line	Horizontal, linear (sf), (Mid-ground)	Regular, linear (sf) (background)	Linear (sf, tl) vertical (pb) (background)
Color	Not Visible	Green/brown, reddish brown (background)	Silver-blue, shiny (sf) tan/brown (pb) (background)
Texture	Not Visible	Fine (background)	Fine (sf, tl) medium (pb) (Mid-ground/background)

Degree of Contrast

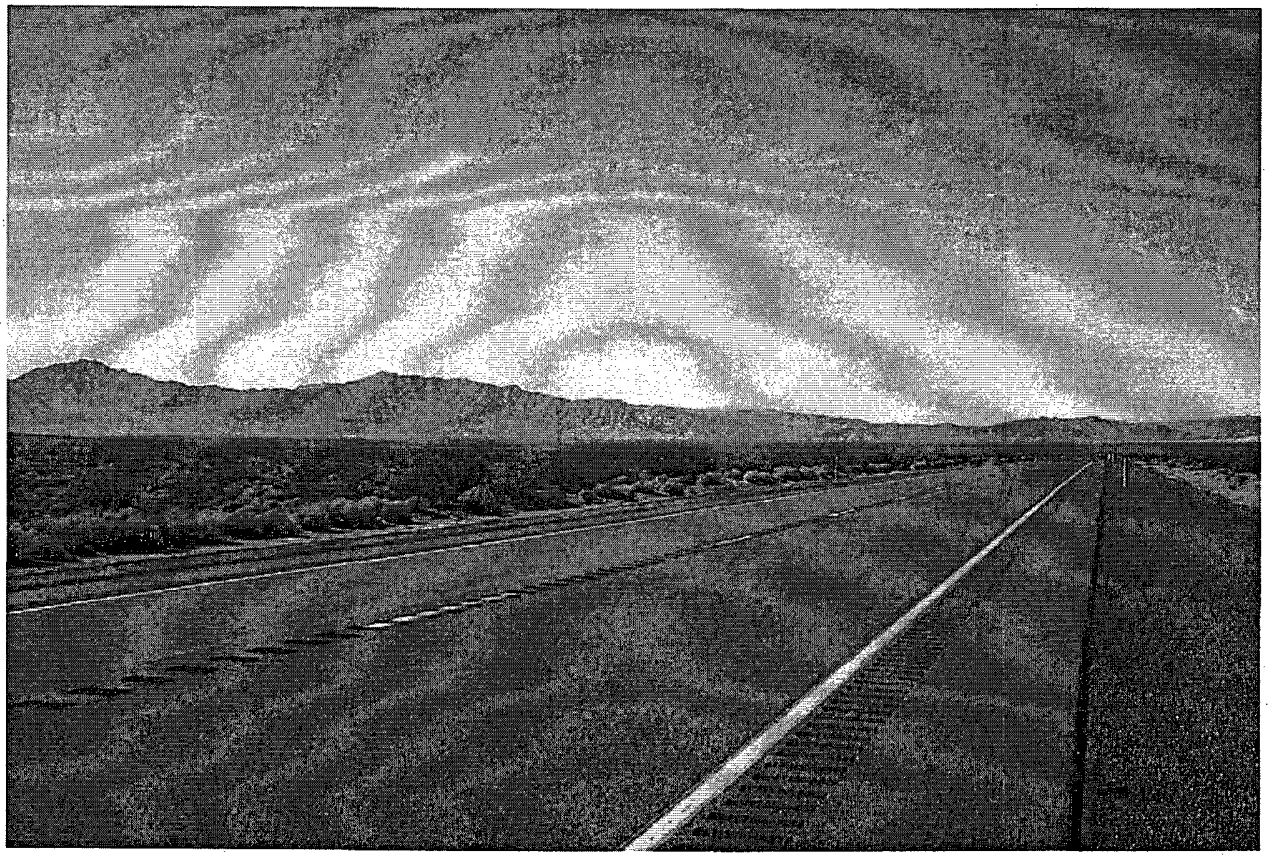
Degree of Contrast		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X				X			X	
	Line				X				X			X	
	Color				X				X			X	
	Texture				X				X			X	

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
See Chapter 4 - Mitigation

Evaluators Names:
Conrad Langley, Marc Schwartz

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

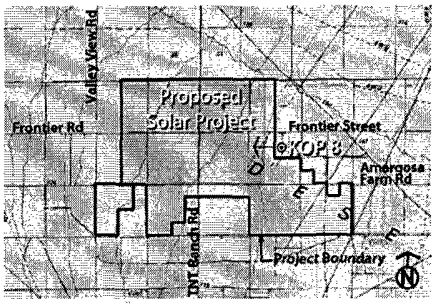


KOP 7 – View facing west-southwest from US95

Weak contrast would result from construction and operation of the proposed project with a naturalistic project setting designated as VRM Class IV. The construction of the project would result in substantial grading and the clearing of vegetation, but is unlikely that the contrast of modifications to landform and vegetation would be seen from this KOP. The proposed project structures would be seen from KOP 7 at a distance of approximately 8 ½ miles and would be seen from a level viewing position with backdropped views, further reducing the overall perceived impacts. Overall impacts are anticipated to be low.

VISUAL CONTRAST RATING WORKSHEET

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

Project Name:	**Location**	Location Sketch
Amargosa Farm Road Solar Project	Township 16S	
Key Observation Point : 8	Range 49E	
Atomic Road / Frontier Road	Section 8	
VRM Class: IV		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal (foreground) Triangular (background)	Low to tall (foreground) Low (mid to background)	Geometric, rectilinear (foreground) linear, Vertical(mid-ground)
Line	Horizontal (foreground) Undulating (background)	Regular, vertical (foreground) Regular, horizontal (mid ground)	Vertical (mid-ground)
Color	Tan (foreground) Brown and dark brown (background)	Dark greens and browns	Brown
Texture	Fine (foreground) Coarse (background)	Coarse (foreground) Fine (mid and background)	Fine (background)

Proposed Activity Description (Facility)

Facilities – Transmission Lines (tl), Solar Fields (sf), Power Block (pb), and Wind Fence (wf)

	Landform/Water	Vegetation	Structures
Form	Flat (sf) (foreground)	Geometric from clearing (sf) (foreground)	Linear (tl), linear, rectangular (sf, wf), tall, geometric, cylindrical (pb) (foreground)
Line	Horizontal, linear (sf), foreground)	Regular, linear (sf) (foreground)	Linear (sf, tl, wf) vertical (pb) (foreground)
Color	Tan (sf) (foreground)	Green (foreground)	Silver-blue, shiny (sf) tan/brown (pb, wf) (foreground)
Texture	Fine (foreground)	Coarse (foreground)	Fine to medium (foreground/background)

Degree of Contrast

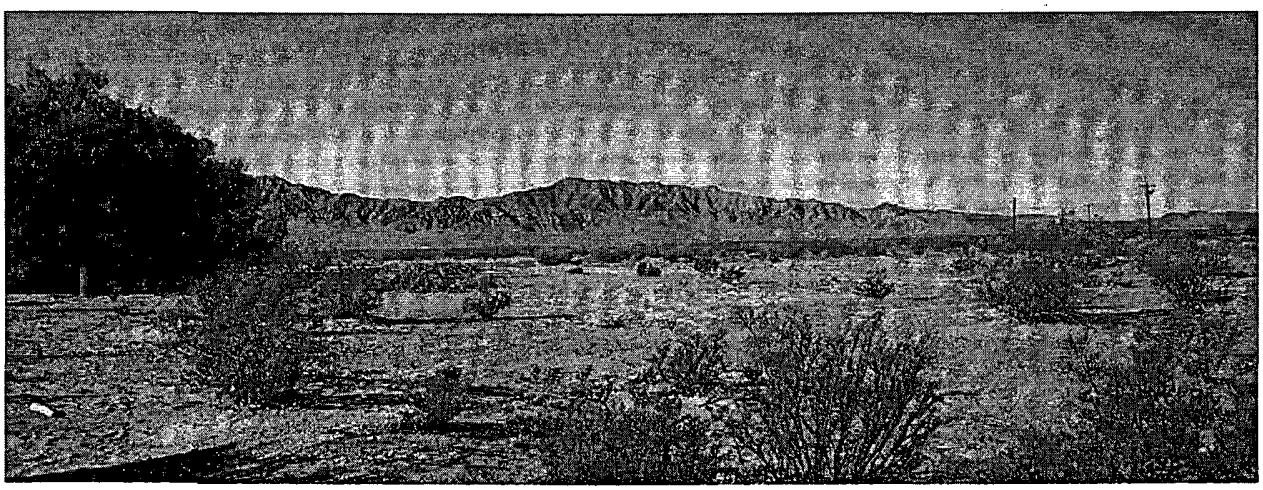
Degree of Contrast		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X		X			X			
	Line				X		X			X			
	Color			X				X		X			
	Texture			X			X				X		

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
See Chapter 4 - Mitigation

Evaluators Names:
Conrad Langley, Marc Schwartz

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

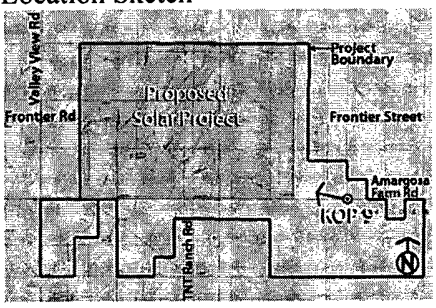


KOP 8 – View facing west from Atomic Road

Moderate / strong contrast would result from construction and operation of the proposed project with naturalistic project setting designated as VRM Class IV. The construction of the project would result in substantial grading and the clearing of vegetation, with a moderate/weak contrast of the vegetation removal and grading from this vantage point. The proposed project structures would be seen from KOP 8 at a distance of approximately ¼ mile and would be seen from a level viewing position with the dominant view being of the proposed project wind fence and potentially the first row of solar collectors and tops of power block components. Dense vegetative screening from the nearby residences would range from obscuring some direct views and completely screening other views, thereby further reducing the overall perceived impacts. Overall impacts are anticipated to be high / moderate.

VISUAL CONTRAST RATING WORKSHEET

Date: December 2009	
District: Southern Nevada District	
Resource Area: Pahrump	
Activity (program): Solar Facilities	

Project Name:	**Location**	Location Sketch
Amargosa Farm Road Solar Project	Township 16S	
Key Observation Point : 9	Range 49E	
Amargosa Farm Road	Section 9	
VRM Class: IV		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal (foreground and mid-ground) Irregular (background)	Low, horizontal (foreground and mid-ground) Vertical, pyramidal (mid-ground)	Linear, vertical (poles) Linear, narrow (road)
Line	Horizontal (foreground and mid-ground) Undulating, diagonal (background)	Regular (foreground to background) Vertical (mid-ground)	Vertical (poles) Straight, horizontal (road)
Color	Tan (foreground and mid-ground) Dark Brown/brown (background)	Brown/green (foreground) Brown, green, dark green (mid-ground)	Brown (poles) Dark grey (road)
Texture	Fine (foreground and mid-ground) Coarse (background)	Patchy, coarse (foreground) Fine (mid and background)	Fine, regular (poles) Fine, continuous (road)

Proposed Activity Description (Facility)

Facilities – Transmission Lines (tl), Solar Fields (sf), Power Block (pb), and Wind Fence (wf)

	Landform/Water	Vegetation	Structures
Form	Flat, Horizontal (sf) (foreground)	Geometric from clearing (sf, pb road alignment) (foreground)	Linear (tl), linear, rectangular (sf, wf), tall, geometric, cylindrical (pb) (foreground)
Line	Horizontal, linear (sf), (foreground)	Regular, linear (sf) (foreground)	Linear (sf, tl, wf) vertical, geometric (pb) (foreground)
Color	Tan	Brown/green (foreground)	Silver-blue, shiny (sf) tan/brown (pb, wf) (foreground)
Texture	Fine	Patchy, course (foreground)	Fine (sf, tl, wf) medium (pb) (foreground to background)

Degree of Contrast

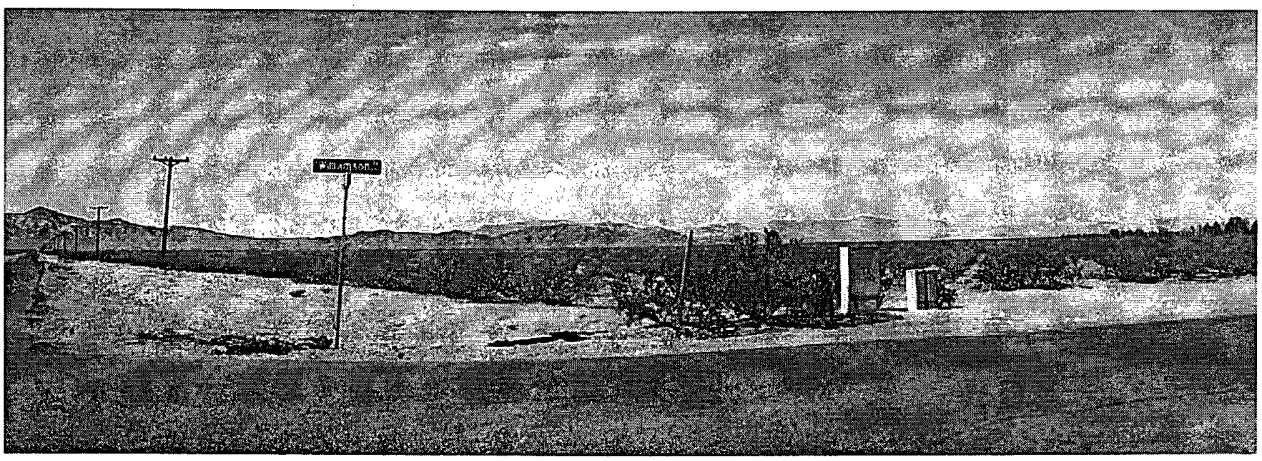
Degree of Contrast		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form			X			X			X			
	Line			X			X			X			
	Color		X				X			X			
	Texture			X			X			X			

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
See Chapter 4 - Mitigation

Evaluators Names:
Conrad Langley, Marc Schwartz

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities



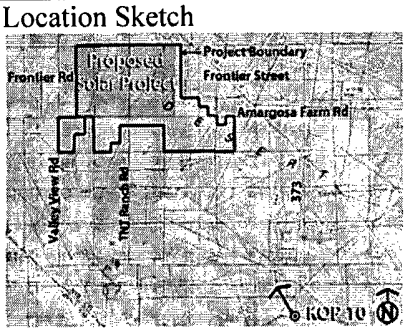
KOP 9 – View facing northwest from Amargosa Farm Road

Moderate / strong contrast would result from construction and operation of the proposed project with slightly modified project setting designated as VRM Class IV. The construction of the project would result in substantial grading and the clearing of vegetation with a high/moderate contrast of these elements from this KOP. The proposed project structures would be seen from KOP 9 at a distance of approximately ¾ of a mile and would be seen from a level viewing position with the dominant view being of the proposed project wind fence, solar collectors and tops of power block components.

The 250 foot Amargosa Farm Road realignment would be most evident from this KOP with project components (assembly hall, switchyard, administrative building, and drainage/detention structures) being situated on the south side of the re-aligned road. These project components would increase the project contrast, thus increasing the overall impacts for travelers as they move west to east towards the project. Overall impacts are anticipated to be moderate / high.

VISUAL CONTRAST RATING WORKSHEET

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

Project Name:	**Location**	Location Sketch
Amargosa Farm Road Solar Project	Township 17S	
Key Observation Point : 10	Range 49E	
Northbound NV 373	Section 11	
VRM Class: IV		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal (foreground and mid-ground) Undulating (background)	Low, horizontal (foreground) Low, horizontal; vertical, rounded (mid-ground)	Linear, narrow (foreground to mid-ground) Geometric (mid-ground)
Line	Horizontal (foreground and mid-ground) Undulating (background)	Regular (foreground) Regular; low, vertical (mid-ground)	Straight, horizontal (foreground to mid ground) Simple, geometric (mid-ground)
Color	Tan (foreground and mid-ground) Dark Brown/brown (background)	Browns, green (foreground and mid-ground)	Grey (foreground to mid-ground) White (mid-ground)
Texture	Fine (foreground) Medium to coarse (background)	Fine (foreground) Medium to coarse (background)	Fine, continuous (foreground to mid-ground) Medium (mid-ground)

Proposed Activity Description (Facility)

Facilities – Transmission Lines (tl), Solar Fields (sf), and Power Block (pb)

	Landform/Water	Vegetation	Structures
Form	Not Visible	Geometric from clearing (sf, pb) (background)	Linear (tl), linear, rectangular (sf), tall, cylindrical (pb) (background)
Line	Not Visible	Regular, linear (sf, pb) (background)	Linear (sf, tl) vertical (pb) (background)
Color	Not Visible	Browns, green (background)	Silver-blue, shiny (sf) tan/brown (pb) (background)
Texture	Not Visible	Fine (background)	Fine (sf, tl, pb) (background)

Degree of Contrast

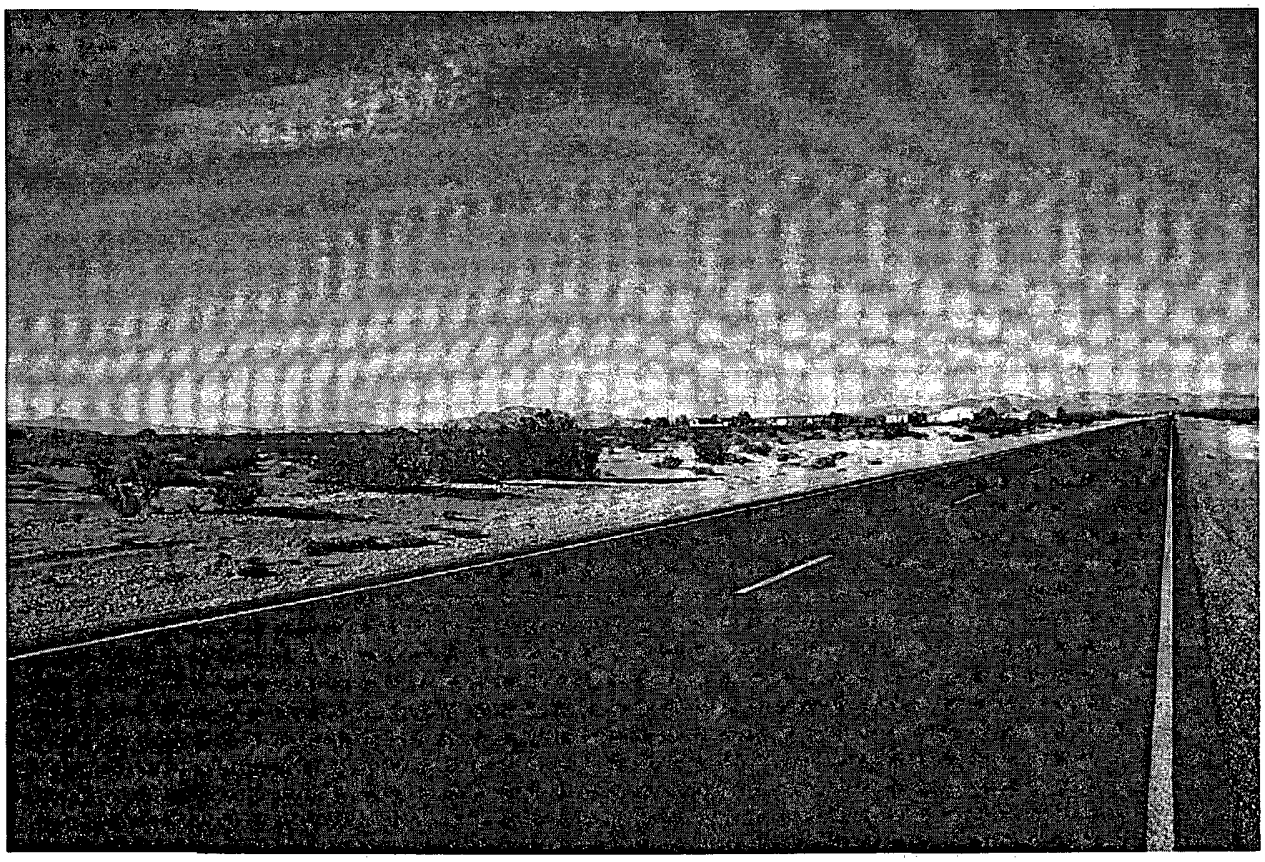
Degree of Contrast		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X				X			X	
	Line				X				X			X	
	Color				X				X			X	
	Texture				X				X			X	

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
See Chapter 4 - Mitigation

Evaluators Names:
Conrad Langley, Marc Schwartz

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

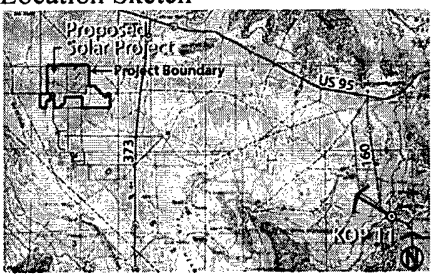


KOP 10 – view facing north-northwest from NV 373

Weak contrast would result from construction and operation of the proposed project with modified project setting designated as VRM Class IV. The construction of the project would result in substantial grading and the clearing of vegetation, but is unlikely that the contrast of modifications to landform and vegetation will be seen from this KOP. The proposed project structures would be seen from KOP 10 at a distance of approximately 5 ½ miles and would be seen from a level viewing position with backdropped views. Existing natural vegetation and vegetative screening from residential, commercial structures, and town infrastructure areas further reduce the overall perceived impacts. Overall impacts are anticipated to be low.

VISUAL CONTRAST RATING WORKSHEET

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

Project Name:	**Location**	Location Sketch
Amargosa Farm Road Solar Project		
Key Observation Point : 11	Township 27N	
NV 160	Range 52E	
VRM Class: IV	Section 26	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal (foreground) Irregular (background)	Low, horizontal (foreground and mid-ground)	Linear, vertical (poles) Linear, narrow (road)
Line	Horizontal (foreground) Undulating (background)	Regular (foreground to background)	Vertical (poles) Straight, horizontal (road)
Color	Tan, light tan (foreground and mid-ground) Dark Brown/brown (background)	Browns, green (foreground to background)	Light brown (poles) Dark grey (road)
Texture	Fine (foreground and mid-ground) Coarse (background)	Fine (foreground to background)	Fine, regular (poles) Fine, continuous (road)

Proposed Activity Description (Facility)

Facilities – Transmission Lines (tl), Solar Fields (sf), and Power Block (pb)

	Landform/Water	Vegetation	Structures
Form	Not Visible	Not Visible	Linear, geometric
Line	Not Visible	Not Visible	Linear
Color	Not Visible	Not Visible	Blue/Silver
Texture	Not Visible	Not Visible	Fine

Degree of Contrast

Degree of Contrast		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X				X				X
	Line				X				X			X	
	Color				X				X			X	
	Texture				X				X				X

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
See Chapter 4 - Mitigation

Evaluators Names:
Conrad Langley, Marc Schwartz

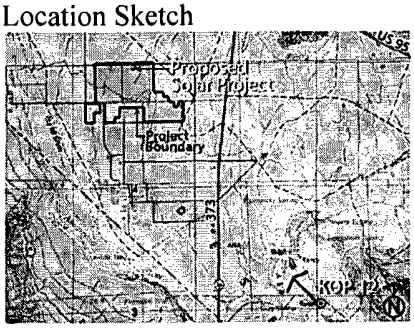
Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

KOP 11 – view facing west from SR 160

Weak contrast would result from construction and operation of the proposed project with a naturalistic setting designated as VRM Class IV. The construction of the project would result in substantial grading and the clearing of vegetation, but is unlikely that the contrast of modifications to landform and vegetation would be seen from this KOP. The proposed project structures will be seen from KOP 11 at a distance of 21 ½ miles and would be seen from a superior viewing position as travelers along NV 160 head down into the valley. Structures would be visible to travelers from this viewing position; however, the distance from the proposed project coupled with backdropped views, would reduce the overall perceived impacts. Overall impacts are anticipated to be low.

VISUAL CONTRAST RATING WORKSHEET

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

Project Name:	**Location**	Location Sketch
Amargosa Farm Road Solar Project	Township 18S	
Key Observation Point : 12	Range 50E	
Ash Meadows – Crystal Springs boardwalk	Section 3	
VRM Class: IV		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	horizontal (foreground to background)	Low to tall (foreground) Low (mid to background)	Geometric (foreground)
Line	Linear, Horizontal (foreground) Undulating (background)	Irregular (foreground) Regular, horizontal (mid-ground to background)	Diagonals (mid-ground)
Color	White, Tans (foreground) Brown and dark brown (background)	Dark greens and browns	Brown
Texture	Fine (foreground to background)	fine (foreground), coarse and patchy (mid-ground) Fine (background)	Coarse (foreground) Fine (background)

Proposed Activity Description (Facility)

Facilities – Transmission Lines (tl), Solar Fields (sf), and Power Block (pb)

	Landform/Water	Vegetation	Structures
Form	Not Visible	Not Visible	Geometric, linear
Line	Not Visible	Not Visible	Low, Linear
Color	Not Visible	Not Visible	Blue/Silver
Texture	Not Visible	Not Visible	Fine

Degree of Contrast

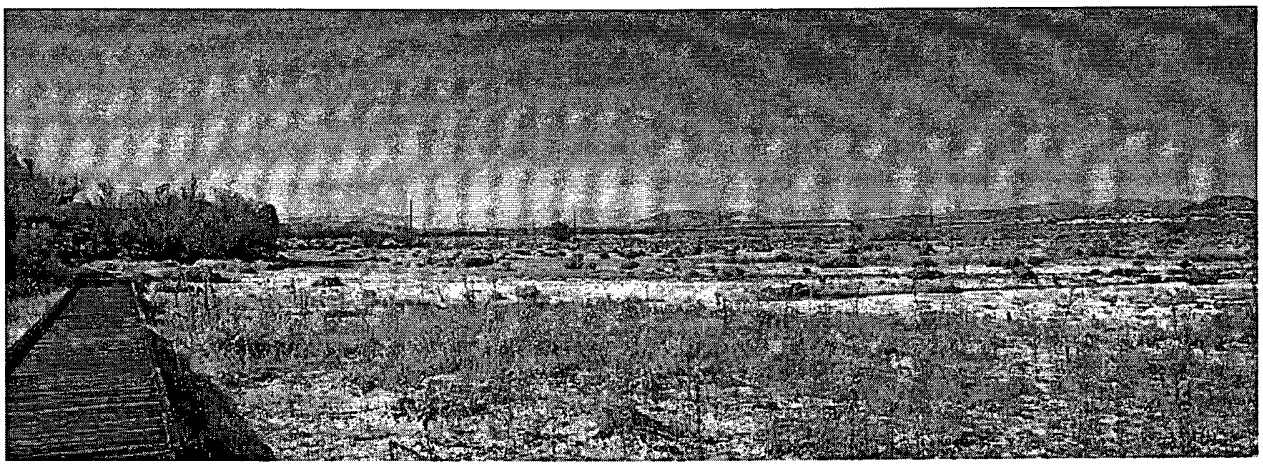
Degree of Contrast		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X				X				X
	Line				X				X				X
	Color				X				X				X
	Texture				X				X				X

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
See Chapter 4 - Mitigation

Evaluators Names:
Conrad Langley, Marc Schwartz

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

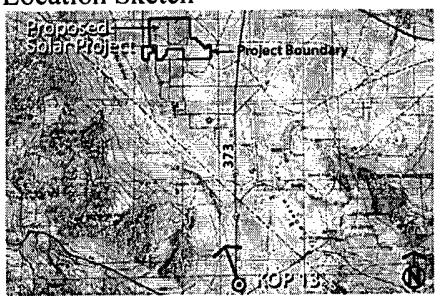


KOP 12 – view facing northwest from Crystal Springs boardwalk, Ash Meadows

Weak contrast would result from construction and operation of the proposed project with a naturalistic setting designated as VRM Class IV. The construction of the project would result in substantial grading and the clearing of vegetation, but is unlikely that the contrast of modifications to landform and vegetation would be seen from this KOP. The proposed project structures would likely be not seen from KOP 12 given that the proposed project will be at a distance of 12 ½ miles and would be seen from a slightly inferior viewing position, further reducing the overall perceived impacts. Overall impacts are anticipated to be low.

VISUAL CONTRAST RATING WORKSHEET

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

Project Name:	**Location**	Location Sketch
Amargosa Farm Road Solar Project		
Key Observation Point : 13	Township 25N	
Northbound CA127 – Death Valley Junction	Range 5E	
VRM Class: IV	Section 11	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal (foreground) Triangular, irregular (background)	Low, horizontal (foreground and mid-ground)	Linear, vertical (poles) Linear, narrow (road)
Line	Horizontal (foreground) Undulating, diagonal, irregular (background)	Regular (foreground to background)	Vertical (poles) Straight, horizontal (road)
Color	Tan (foreground and mid-ground) Dark Brown/brown (background)	Browns, green, pale yellow (foreground to background)	Brown (poles) Dark grey (road)
Texture	Fine (foreground) Fine to Coarse (background)	Fine (foreground to background)	Fine, regular (poles) Fine, continuous (road)

Proposed Activity Description (Facility)

Facilities – Transmission Lines (tl), Solar Fields (sf), and Power Block (pb)

	Landform/Water	Vegetation	Structures
Form	Not Visible	Not Visible	Linear, rectangular (sf), tall, cylindrical (pb) (background)
Line	Not Visible	Not Visible	Linear (sf) vertical (pb) (background)
Color	Not Visible	Not Visible	Silver-blue, shiny (sf) tan/brown (pb) (background)
Texture	Not Visible	Not Visible	Fine (sf, pb) (background)

Degree of Contrast

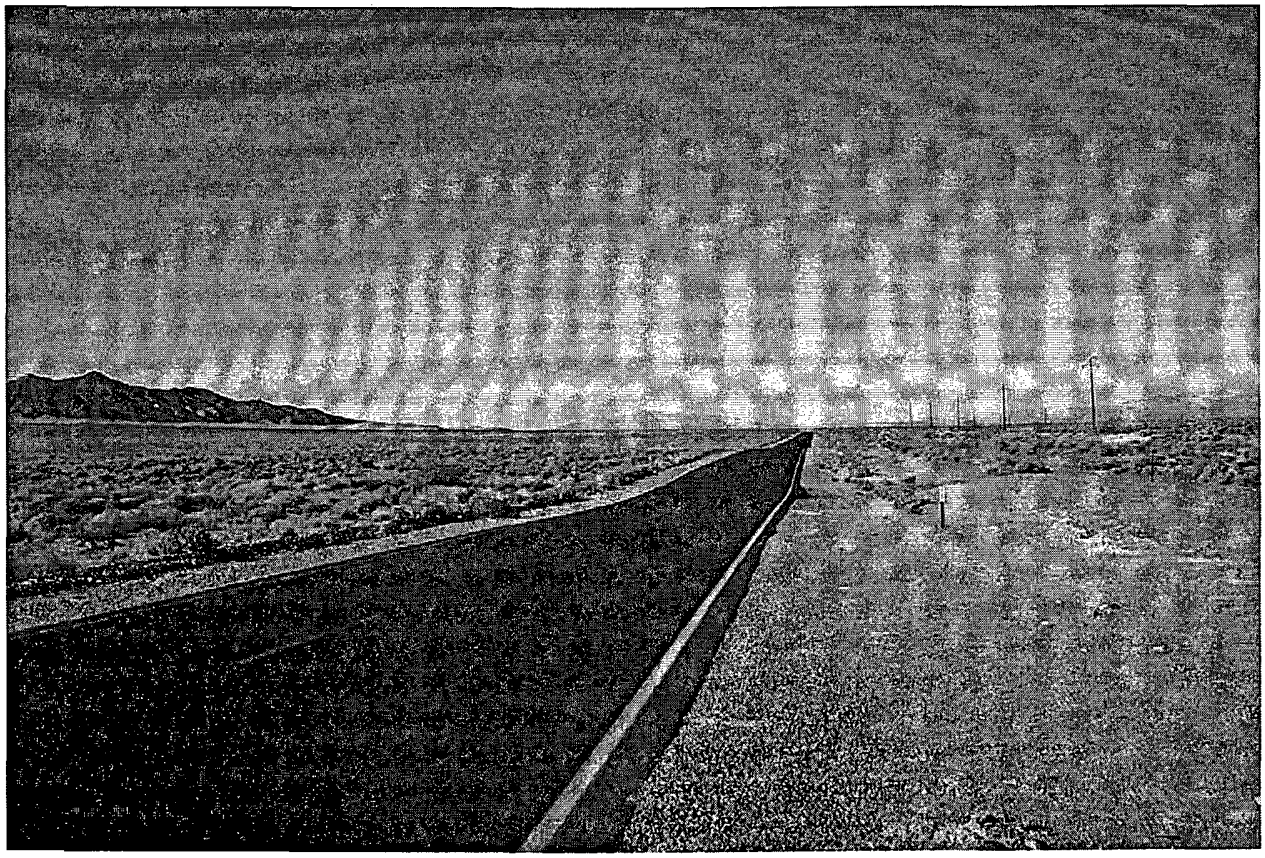
Degree of Contrast		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X				X				X
	Line				X				X				X
	Color				X				X				X
	Texture				X				X				X

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
See Chapter 4 - Mitigation

Evaluators Names:
Conrad Langley, Marc Schwartz

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

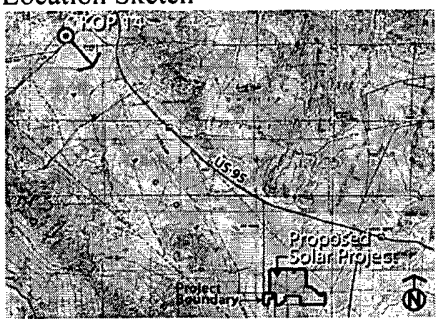


KOP 13 – view facing north-northwest from NV373/CA127, north of Death Valley Junction

Weak contrast would result from construction and operation of the proposed project within a naturalistic project setting designated as VRM Class IV. The construction of the project will result in substantial grading and the clearing of vegetation, but is unlikely that the modifications to landform and vegetation would be seen from this KOP. The proposed project powerblocks would likely be seen from KOP 13 at a distance of approximately 18 miles and would be seen from a level viewing position, but atmospheric conditions would further reduce the overall perceived impacts with changes in topography further decreasing the possibility of overall perceived impacts. Overall impacts are anticipated to be low.

VISUAL CONTRAST RATING WORKSHEET

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

Project Name:	**Location**	Location Sketch
Amargosa Farm Road Solar Project		
Key Observation Point : 14	Township 12S	
Rhyolite cemetery	Range 46E	
VRM Class: IV	Section 21	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Horizontal, flat (foreground) Triangular, Irregular (background)	Low, horizontal (foreground and mid-ground)	Low, geometric (foreground)
Line	Horizontal (foreground) Undulating, jagged (background)	Regular (foreground to background)	Straight, horizontal and vertical (foreground)
Color	Tan (foreground and mid-ground) Dark Brown/brown (background)	Browns, green (foreground to background)	Brown (foreground)
Texture	Fine (foreground) Medium to Coarse (background)	Patchy, course (foreground) Fine (mid-ground to background)	Fine (foreground)

Proposed Activity Description (Facility)

Facilities – Transmission Lines (tl), Solar Fields (sf), and Power Block (pb)

	Landform/Water	Vegetation	Structures
Form	Not Visible	Not Visible	Linear, geometric
Line	Not Visible	Not Visible	Low, linear
Color	Not Visible	Not Visible	Blue, Silver
Texture	Not Visible	Not Visible	Fine

Degree of Contrast

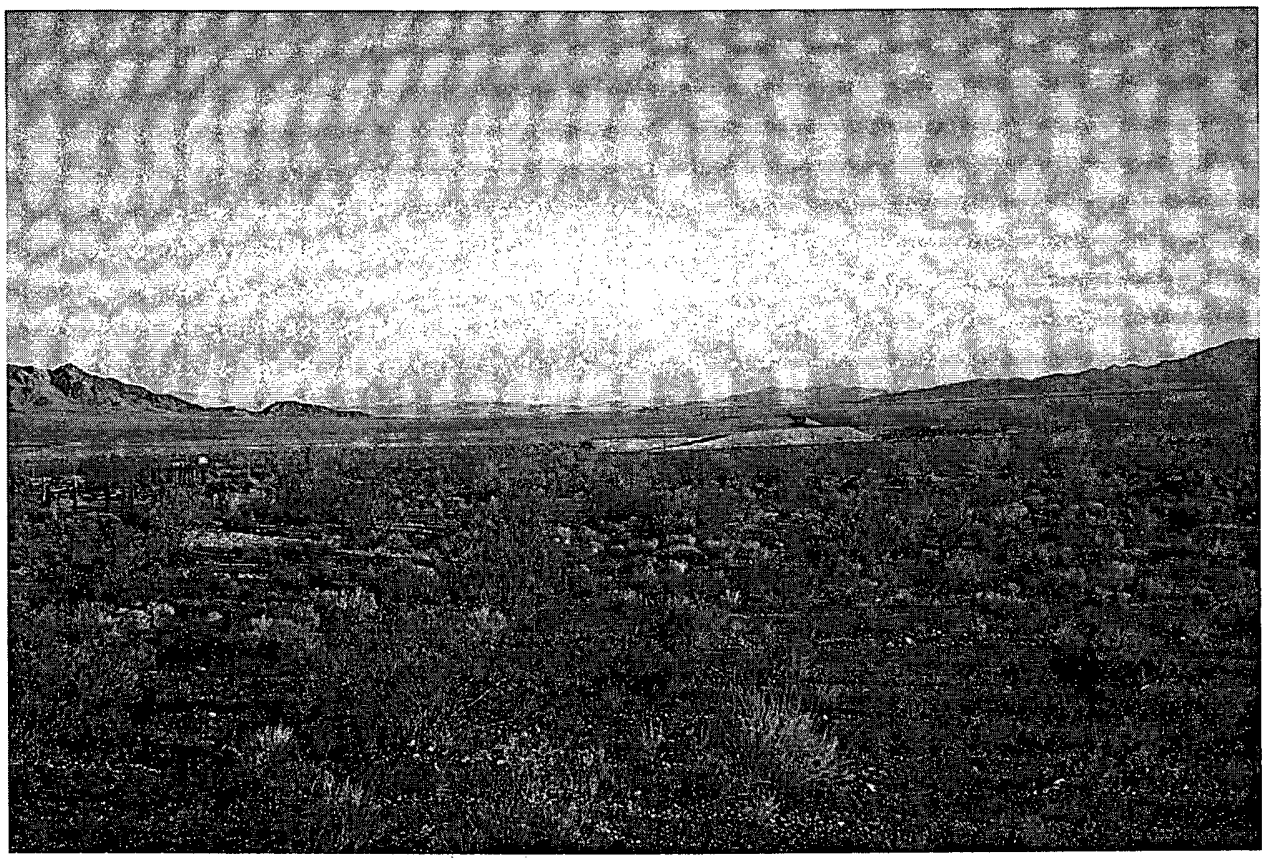
Degree of Contrast		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X				X			X	
	Line				X				X			X	
	Color				X				X			X	
	Texture				X				X			X	

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
See Chapter 4 - Mitigation

Evaluators Names:
Conrad Langley, Marc Schwartz

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

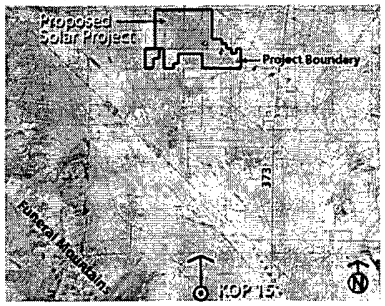


KOP 14 – View facing east-southeast from Rhyolite Cemetery

Weak contrast would result from construction and operation of the proposed project with semi-modified (due to landfill) project setting designated as VRM Class IV. The construction of the project would result in substantial grading and the clearing of vegetation, but is unlikely that the modifications to landform and vegetation would be seen from this KOP. The proposed project structures would be seen from KOP 14 at a distance of approximately 25 miles and would be seen from a slightly-superior viewing position with partial obstructions from topography, further reducing the overall perceived impacts. Possible views of mirrors in the later afternoon may raise contrast level to weak /moderate. Overall impacts are anticipated to be low.

VISUAL CONTRAST RATING WORKSHEET

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities

Project Name:	**Location**	Location Sketch
Amargosa Farm Road Solar Project	Township 26N	
Key Observation Point : 15	Range 4E	
Funeral Mountains Wilderness	Section 7	
VRM Class: IV		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal (foreground) Triangular, Irregular (background)	Low, horizontal (foreground and mid-ground)	None visible
Line	Horizontal (foreground) Undulating, irregular (background)	Regular (foreground to background)	None visible
Color	Tan (foreground and mid-ground) Dark Brown/brown, tan (background)	Browns, green, reddish-browns (foreground to background)	None visible
Texture	Fine (foreground) Medium to Coarse (background)	*Fine (foreground to background)*	None visible

Proposed Activity Description (Facility)

Facilities – Transmission Lines (tl), Solar Fields (sf), and Power Block (pb)

	Landform/Water	Vegetation	Structures
Form	Flat, Horizontal (sf, pb) (background)	Geometric from clearing (sf, pb) (background)	Linear, rectangular (sf), tall, cylindrical (pb) (background)
Line	Horizontal, linear (sf, pb), (background)	Regular, linear (sf, pb) (background)	Linear (sf) vertical (pb) (background)
Color	Light brown	Green/brown, reddish brown (background)	Silver-blue, shiny (sf) tan/brown (pb) (background)
Texture	Fine	Fine (background)	Fine (sf) medium (pb) (background)

Degree of Contrast

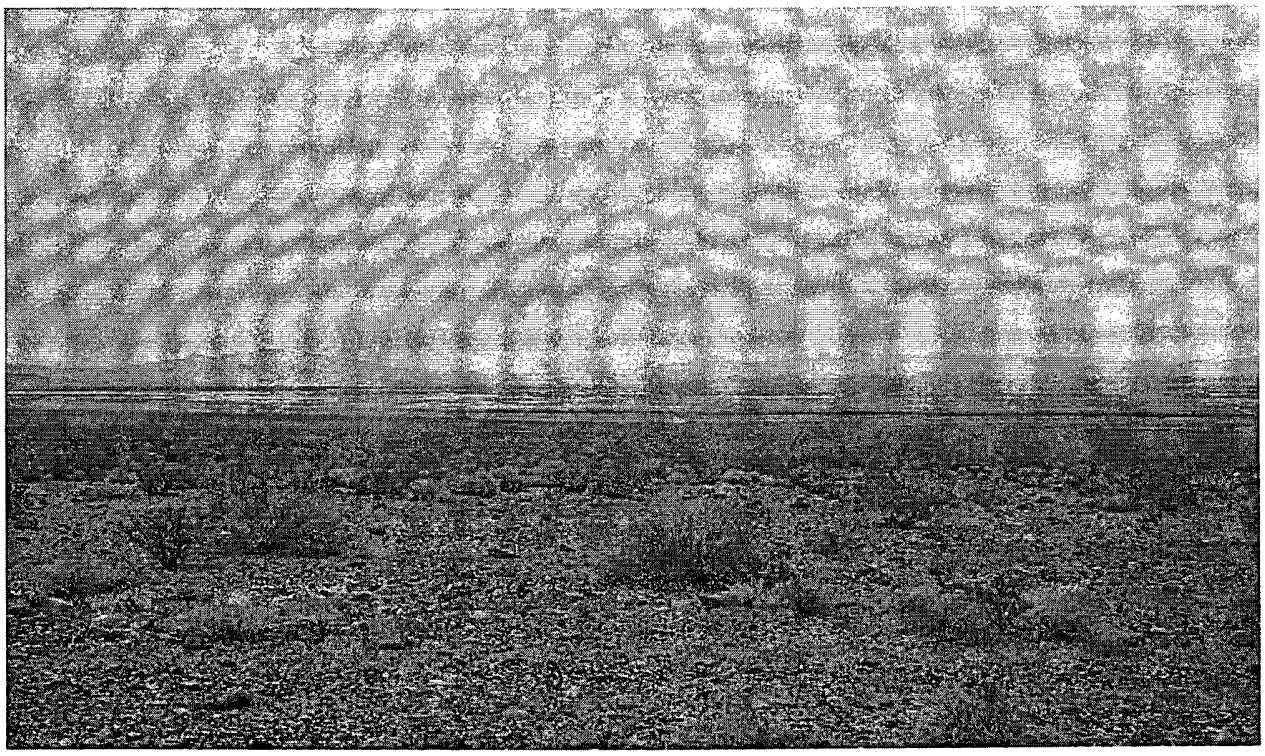
		Features											
		Landform/ Water Body				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X				X			X	
	Line				X			X				X	
	Color				X			X			X		
	Texture				X				X			X	

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
See Chapter 4 - Mitigation

Evaluators Names:
Conrad Langley, Marc Schwartz

Date: December 2009
District: Southern Nevada District
Resource Area: Pahrump
Activity (program): Solar Facilities



KOP 15 – View facing south from Funeral Mountain Wilderness

Moderate contrast would result from construction and operation of the proposed project with moderately modified project setting designated as VRM Class IV. The construction of the project would result in substantial grading and the clearing of vegetation, but is unlikely that the contrast of modifications to landform and vegetation would result in increased project contrast from this vantage point. The proposed project structures would be seen from KOP 15 at a distance of 13 miles and would be seen from a superior viewing position. Due to the north-south orientation of the solar troughs as seen from this KOP, the likelihood of mirrors reflecting the blue sky would be minimized except during mid-day hours. Solar collectors, power block components, and ancillary facilities would be seen increasing the contrast in the structure's form and line; however, the distance from the proposed project coupled with backdropped views, will reduce the overall perceived impacts. Overall impacts will be moderate.

Appendix E

Conceptual Stormwater Control Plan

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CONCEPTUAL STORMWATER CONTROL PLAN

Amargosa Farm Road Solar Project

Nye County, Nevada

Job No.: SML0801.000
Date: December 2008

Prepared By:
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Mark J. Failla, P.E.
NV Professional Engineer No. 14566

Assisted By: Steve Jones, P.E.

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- Exhibit C – Existing Condition Offsite Drainage Map
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- Exhibit E – Proposed Condition Drainage Map
- Exhibit F – Flood Control Facilities Map – Perimeter Facilities
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Appendix B: Conceptual Grading Plan & Typical Sections

Appendix C: Electronic Data CD

1 INTRODUCTION

1.1 Project Overview & Study Purpose

Solar Millennium, LLC is proposing to develop approximately 7,810 acres of property for utilization of solar power generation. Exhibit A included in Appendix A is a location map for the project and provides the limits of the property boundary. The initial phase of the project focuses on utilization of approximately 4,100 acres of the total 7,810 acres.

The purpose of this study is to provide a conceptual stormwater control plan for development of the initial 4,100 acres project site. More specifically this study provides the following:

- Summary of site research and data collection
- Discussion of FEMA floodzone impacts
- Discussion of local design requirements
- Summary of existing and proposed hydrologic analyses
- Summary of conceptual stormwater control facilities

This study is intended to provide only a conceptual stormwater plan for protection of the project site from onsite and offsite storm flows. As such, this study provides only a summary of results and conclusions and supporting hydrologic and hydraulic computations have been purposely omitted. This study is not suitable for submittal to Nye County in support of detailed grading and improvements plans and it is acknowledged that technical studies in support of future improvement plans will be required.

1.2 Site Description

The project site is located in Amargosa Valley, Nye County, Nevada approximately four miles southwest of the intersection of State Route 373 and U.S. Highway 95. Amargosa Farm Road (Farm Road) traverses the southern portion of the property in an east/west direction. Farm Road will be relocated as a part of this project along the frontage of the solar field in order to accommodate the modular layout of the field.

The project site is flat with an average 1-percent slope falling from northeast to southwest across the site. The site consists of desert shrub with numerous defined, intermittent and braided washes traversing in a southwesterly direction.

The project site is located with the watershed of the Forty-Mile Wash as determined by USGS quad maps and the USGS National Hydrography Data Set. The Forty-Mile Wash consists of an approximate 330 square mile drainage area measured to the southern property line of the project site. The section of the Forty-Mile Wash impacting the site is considered alluvial based on site field investigation and review of aerial photography. The apex of the Forty-Mile Wash is clearly identifiable approximately one-half mile north of Interstate 95.

1.3 FEMA Flood Zone Designation

The project site is currently located in a Federal Emergency Management Agency (FEMA) Zone X as depicted on the effective Flood Insurance Rate Map (FIRM) Panels 320018 4125C, 320018 4150C, 320018 4225 C and 320018 4250C dated September 28, 1990. A Zone X is defined by FEMA to be areas determined to be outside the 0.2% annual chance floodplain. Zone X designations are not regulated by FEMA. Exhibit B identifies the project site on the current effective FIRMs and has been included in Appendix A for reference.

The Forty-Mile Wash, north of U.S. Highway 95 is located within a FEMA designated Zone A Special Flood Hazard Area (SFHA). A Zone A SHFA is defined by FEMA to be areas subject to inundation by the 1% annual chance flood event, no base flood elevations determined. Zone A designations are regulated by FEMA. It is noted that although the portion of the Forty-Mile Wash located within the project site is not located within a FEMA Zone A, the site will clearly exhibit impacts due to flooding. As such, FEMA has no regulatory authority within the project site and it will not be required to submit any information to FEMA for development of the project area.

1.4 Regional Flood Control Master Plan

No regional flood control master plan exists for this area of Nye County.

2 METHODOLOGY

2.1 Compliance

The methodologies utilized in the preparation of this study are in compliance with the *Nye County Guidelines for Design and Review of Development Engineering Submissions, dated February* 2005, (Nye County Guidelines, Reference 1) and the *Clark County Regional Flood Control District's Hydrologic and Drainage Design Manual* (CCRFCD Manual, Reference 2). Per the Nye County Guidelines, the CCRFCD Manual is to be used for all methodologies not covered in the Nye County Guidelines.

2.2 Hydrologic Modeling

Modeling: The SCS Unit Hydrograph Method (SCS Method) within the U.S. Army Corp of Engineers HEC-1 Flood Hydrograph Package was utilized to determine peak flow rates. The SCS Method utilizes precipitation, drainage area, curve number and lag time parameters to determine peak flow rates.

Precipitation: Rainfall depths have been obtained from the NOAA Atlas 14 Precipitation Server. Six-hour precipitation values were obtained for the 10-year, 25-year and 100-year storm events for onsite basin analysis and 100-year only were obtained for offsite analysis. Precipitation values were obtained for the site and each individual offsite basin at the centroid of each area. Appropriate drainage area reduction factors (DARFs) referenced from the CCRFCD Manual have been applied to watersheds exceeding 0.5 square mile in area. The Storm Distribution No.3 (SDN 3) from Table 503

in the CCRFCD Manual was used for drainage areas less than 8 square miles. The SDN4 was used for drainage areas greater than 8 square miles and less than 12 square miles. The SDN5 was used for drainage areas greater than or equal to 12 square miles.

Curve Number: The SCS curve number loss rate methodology was utilized to approximate infiltration for the drainage subbasins. Soils data utilized for the hydrologic analyses presented in this study have been referenced from the NRCS Web Soil Survey and the NRCS Soil Data Mart websites. This survey delineates soil types and provides the Hydrological Soil Group (HSG) designation for each soil unit. Curve numbers (CN) were developed for the subbasins based upon existing and proposed condition land use.

Lag Time: The lag time is defined as the time measured from the center of mass of effective rainfall to the time to peak of the outflow hydrograph. The lag time is related to the time of concentration as 0.6 times the time of concentration.

The time of concentration is defined as the time required for runoff to flow from the hydraulically most distant point of a subbasin to the outlet point of the subbasin. Per the CCRFCD Manual, time of concentration (T_C) is a combination of an initial overland time (T_i), and travel time (T_t) in a ditch, channel, gutter, storm sewer, etc.

For offsite drainage areas larger than 1 square mile, the CCRFCD Manual recommends the use of a USBR derived equation to determine the lag time and was utilized for the hydrologic analyses. For onsite basins exceeding 1 square mile, lag times were determined utilizing methodologies from Section 602 of the CCRFCD Manual as they were determined to result in more reasonable results.

2.3 Hydraulic Modeling

Flood Control Facilities: Flood control facilities were conceptually sized and analyzed by normal depth methodologies utilizing the Flowmaster Version 7.0 software by Haestad Methods.

Flood Plain Analysis: The existing condition flood plain analysis was conceptually analyzed utilizing the HEC-RAS computer program by the U.S. Army of Engineers. It is noted that the HEC-RAS program may not be the most appropriate methodology to analyze the alluvial fan condition that impacts the site and that a more appropriate method such as Flo-2D may be required for future evaluation for the project.

3 EXISTING DRAINAGE CONDITION

3.1 Definition of Existing Condition

The existing condition considers the offsite and onsite land use and drainage patterns as they currently exist.

3.2 Discussion of Existing Condition

The contributing drainage area to the Forty-Mile Wash was determined to be approximately 330 square miles measured to the southern property boundary. Various subbasins were evaluated in order to determine peak flows rates in areas of interest. Exhibit C included in Appendix A identifies the offsite drainage areas utilized in the hydrologic evaluation.

Concentration points PT1, PT2 and PT3, as well as Subbasins SUB10 and SUB11 were created to determine existing condition peak flow rates at key locations along the southern property line. These locations have been utilized for comparison to the proposed condition peak flow rates at the same location in order to ensure that existing condition peak flows at the property boundary will not be exceeded by development of the project site. Exhibit D included in Appendix A identifies the onsite drainage areas utilized in the hydrologic evaluation.

In order to estimate the limits of the existing Forty-Mile Wash 100-year flood plain impacting the site a HEC-RAS hydraulic model was prepared. Exhibit H included in Appendix A depicts the estimated 100-year flood plain limits through the project site.

3.3 Summary of Existing Condition Flows

Exhibits C and D included in Appendix A provide a summary of peak 100-year flow rates determined for the existing condition drainage areas evaluated by this study. The following table provides a summary of peak 100-year flow rates determined at the key locations discussed above.

Table 1: Existing Condition Peak Flow at Key Locations

Subbasin/Concentration Point	Q_{100} (cfs)
PT1	9,596
PT2	129
PT3	262
SUB10	880
SUB11	482

4 PROPOSED DRAINAGE CONDITION

4.1 Definition of Proposed Condition

The proposed condition is identical to the existing condition with the exception that onsite areas were assessed with a developed land use, and drainage patterns were routed based on proposed conveyance facilities.

4.2 Discussion of Proposed Condition

The proposed condition was assessed in order to determine impacts due to development of the site and to support flood control facility design for protecting the project site. The general concept of the proposed conceptual stormwater control plan is to limit post-development peak flow rates to pre-development limits, and return the flow to the same location and in the same manner as the existing condition in accordance with Nevada Drainage Law.

Concentration points PT1, RPT2 and PT4, as well as Subbasins 789 and SUB11 were created to provide comparison to the same locations evaluated for the existing condition along the southern property line. Exhibit E included in Appendix A identifies the drainage areas utilized in the proposed condition hydrologic evaluation for use in facility design and for comparison to existing conditions.

In order to assess onsite drainage conditions and to determine onsite facility design, Subbasins SITEA, SITEB, SITEC and SITED were subdivided based on proposed drainage patterns. Peak 10, 25 and 100-year storm flows were pro-rated from the parent basin (i.e.: SITEA, SITEB, etc.) in order to determine onsite peak flow rates at key locations necessary for onsite facility design. Prorated Subbasins A-A, B-A, C-A, D-A, A-B, B-B, C-B, and D-B were created based on typical proposed onsite drainage patterns and have also been identified on Exhibit E.

4.3 Summary of Proposed Condition Flows

Exhibits E included in Appendix A provides a summary of peak 100-year flow rates determined for the proposed condition drainage areas evaluated by this study. The following table provides a summary of peak 100-year flow rates determined at the key locations discussed above.

Table 2: Proposed Condition Peak Flow at Key Locations

Subbasin/Concentration Point	Q_{100} (cfs)
PT1	9594
RPT2	121
PT4	846
SUB789	133
SUB11	482

The following table provides a comparative summary of the existing and proposed condition discharge flow values at equivalent locations.

Table 3: Comparison Summary – Existing Condition vs. Proposed Condition

Comparison Location (Existing/Proposed)	Existing Condition Flow Q_{100}	Proposed Condition Flow Q_{100}
PT1/PT1	9,596	9,594
PT2/RPT2	129	121
PT3/789	262	133
SUB10/PT4	880	846
SUB11/SUB11	482	482

Review of the table above indicates that post-development peak flowrates will be limited to pre-development conditions based on the proposed conceptual stormwater control plan.

5 CONCEPTUAL STORMWATER CONTROL FACILTITES

5.1 Alternatives Assessment

Various alternatives were considered in the assessment of protecting the project site from offsite storm flows. The alternative assessment generally considered feasibility, construction cost and community advantages. The following two alternatives were considered the most viable:

1. Provide a regional offsite detention basin at the apex of the Forty-Mile Wash located north of U.S. Highway 95: This alternative would effectively and considerably reduce existing condition peak storm flow downstream of U.S. Highway 95. This alternative would allow reduction in size of perimeter flood control facilities necessary for protection of the project site. Additionally, this alternative would benefit all properties downstream of the detention basin. Since this alternative requires the detention basin to be located at the apex of the Forty-Mile Wash, the primary negative is that the detention basin would be located outside of the current BLM Land Grant request area.

2. Provide 100% interception and conveyance for the entire existing condition flow from the Forty-Mile Wash: This alternative would provide site perimeter flood control facilities with sufficient capacity to intercept and convey the peak 100-year storm event flow from the Forty-Mile Wash. This alternative is considered more expensive than Alternative No. 1; however it would be entirely located on the subject project and not reliant on offsite property.

Although Alternative No.1 appears to be a viable and financially more attractive choice; for purposes of this study, Alternative No.2 was selected due to the fact that it is within the current site boundary. As the project progresses it is likely that Alternative No.1 will be pursued with Nye County and BLM further.

5.2 Offsite Runoff – Stormwater Control Facilities

As discussed above and for purposes of this study, Alternative No. 2 was selected to intercept and convey offsite flow. In general, the protection of the property from the Forty-Mile Wash will be provided by means of a continuous concrete lined channel around the northern and western perimeter of the site. The channel has been designed to effectively intercept the 100-year storm event offsite runoff and convey the concentrated flow to the southwest corner of the property. The southwest corner of the property has been identified as the historic discharge location of the Forty-Mile Wash (Concentration Point PT1). The channel will discharge within the property limits and energy dissipation facilities will be provided in order to disperse the concentrated flow back to a shallow sheet flow condition prior to leaving the property boundary. As discussed in Section 4.3, the flow will be returned to the Forty-Mile Wash in the historic quantity, location and manner in accordance with Nevada Drainage Law.

Additionally, a concrete lined channel is proposed along the eastern side of the solar field in order to intercept and collect flows impacting the Phase 1 development from the east. Similar to the Forty-Mile Wash channel, the concentrated flow will be released on property in its historic location (Concentration Point PT4) and an energy dissipation facility will be provided in order to return the flow to a shallow sheet flow condition prior to leaving the property. The flow will be returned in the historic quantity, location and manner in accordance with Nevada Drainage Law.

Perimeter channels are recommended to be concrete lined due to the high velocity potential and for maintenance reasons.

Exhibit F, included in Appendix A, provides the locations, design flows, design slopes and facility geometry for the conceptual perimeter facilities considered necessary to protect the site from offsite storm flows.

5.3 Onsite Runoff – Stormwater Control Facilities

Due to the size of the solar field area, the site itself has potential to generate large storm flows during a rain event. For this reason, onsite stormwater control facilities are necessary to protect onsite facilities, and to convey stormwater runoff to historic discharge locations in both quantity and manner of flow.

In order to assess onsite facilities, the solar field project area was divided into four typical quadrants identified as SITEA, SITEB, SITEC and SITED (see Exhibit E). Each quadrant is assumed to have equivalent storm flow and facility designs. The general concept is that each quadrant will consist of a series of open channel facilities (Minor Channels) intercepting and conveying stormwater runoff to a concrete lined channel facility (Major Channels) located along the west side of each quadrant. Each of the four Major Channels is designed to intercept and convey the 100-year storm event design

flow from each section. All Minor Channels within each section are designed to intercept and convey the 25-year storm event to the Major Channels. This concept was selected in order to reduce costs for onsite drainage facilities, while still providing desired flood protection. All Major Channels are recommended as concrete lined for purposes of reliability and maintenance.

Exhibit G, included in Appendix A, provides the locations, design flows, design slopes and facility geometry for the conceptual onsite facilities considered necessary to protect the site from storm flows.

In addition to onsite channel facilities, an onsite detention basin is considered necessary in order to limit post-development flows at Concentration Point PT2 to pre-development limits. The onsite detention basin facility location and size is indicated on Exhibit G.

As a result of the anticipated re-alignment of Amargosa Farm Road along the southern boundary of the solar field area, numerous underground culvert facilities will be necessary to convey storm flow from the onsite open channel facilities below the roadway. The locations of the culvert facilities have been located on Exhibit G.

6 CONCLUSION

The hydrologic and hydraulic analyses, and the stormwater control facilities presented in this study are considered conceptual. Detailed technical analyses will be required in support of future grading and improvement plans as required by Nye County.

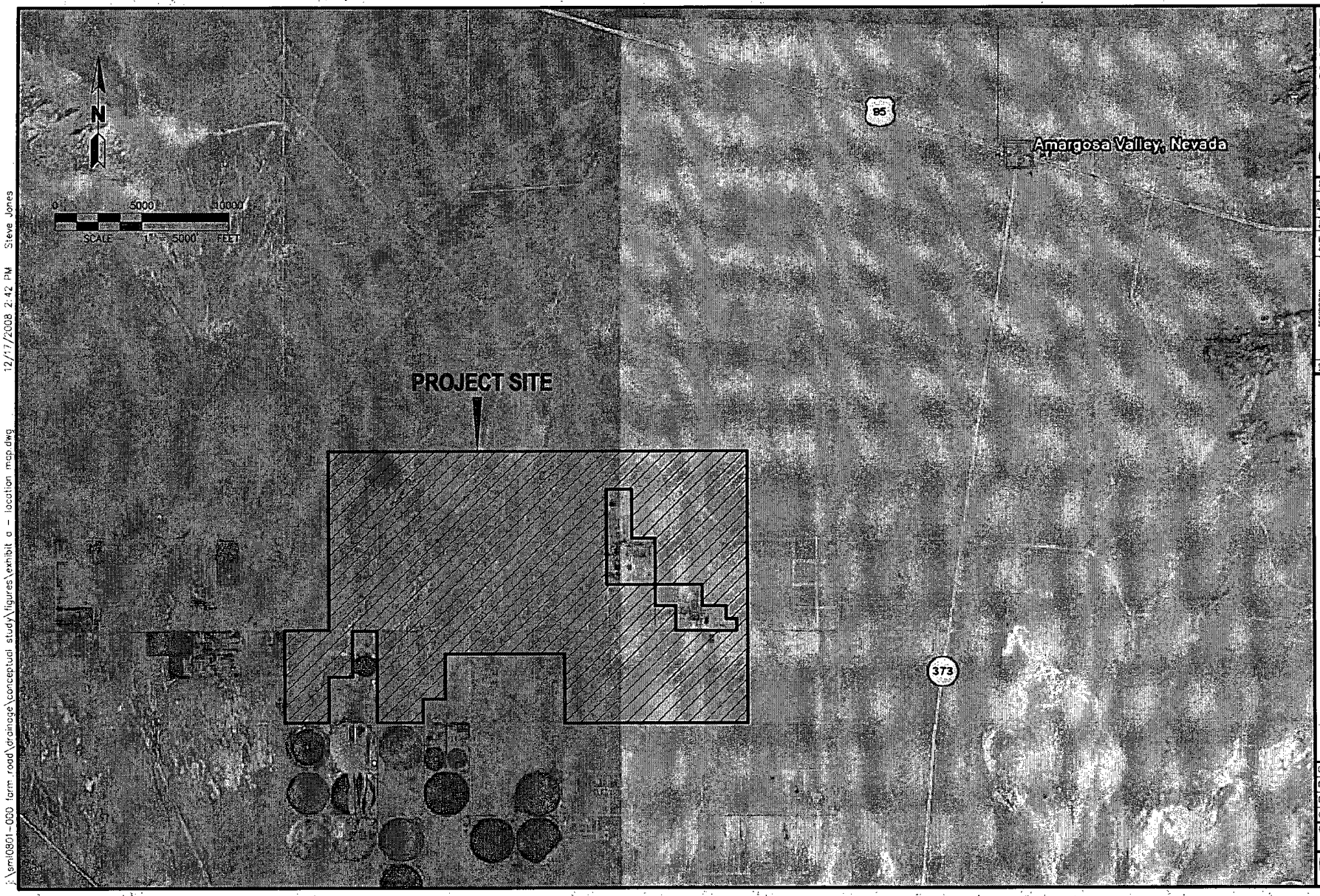
The conceptual stormwater control facilities presented in this study provide a design in accordance with Nevada Drainage Law. More specifically, the design presents a drainage concept that returns offsite and onsite developed flow to historic locations in both quantity and manner, thus not resulting in any adverse impacts to downstream property owners.

A conceptual grading plan and typical drainage channel sections have been included in Appendix B.

7 REFERENCES

1. *Hydrologic Criteria and Drainage Design Manual.* Clark County Regional Flood Control District, 1990.

2. *Guidelines for Design and Review of Development Engineering Submissions*, February 2005, Nye County Department of Public Works.



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NO.	DESCRIPTION	DATE	BY	DATE CHK	APP

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

SOLAR MILENNIUM, LLC

AMARGOSA FARM ROAD SOLAR PROJECT
LOCATION MAP

DATE: 11/17/08
DRAFTER: SMJ
DESIGNER: SMJ
CHECKED: MJF
PROJECT NO. SML0801.000

EXHIBIT A
SHEET 1 OF 1

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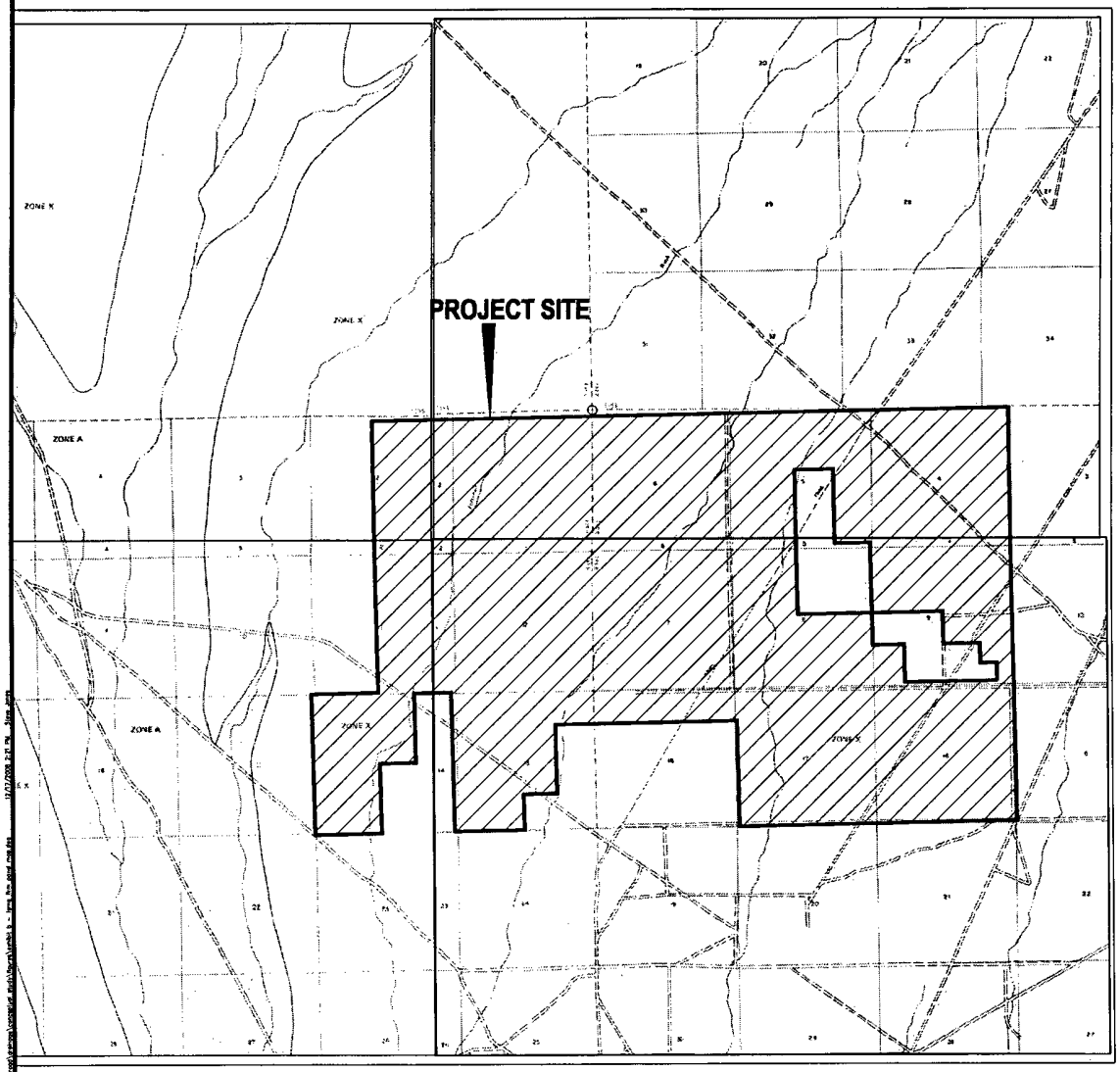

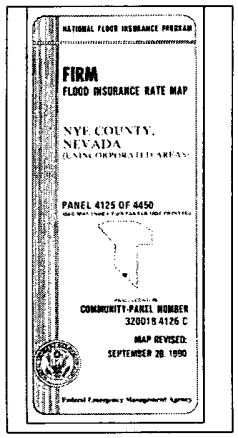

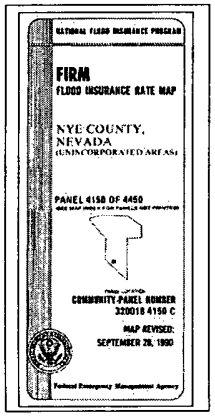

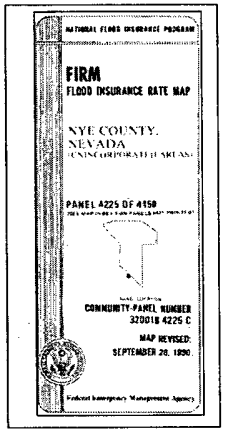

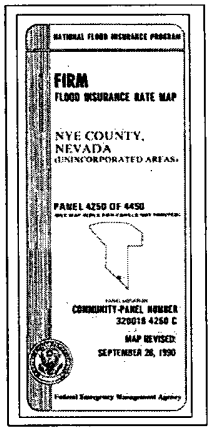

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
PHONE (702) 434-0707 EMAIL LAS VEGAS, NEVADA
FAX (702) 434-0709

NO.	DESCRIPTION	DATE	BY	APP.	APP. DATE

SOLAR MILENNIUM, LLC

AMARGOSA FARM ROAD SOLAR PROJECT

FEMA FIRM PANEL MAP

DATE: 11/17/06
DRAFTER: SMJ
DESIGNER: SMJ
CHECKED: MJF
PROJECT NO.
SML0601-000

EXHIBIT B
SHEET 1 OF 1

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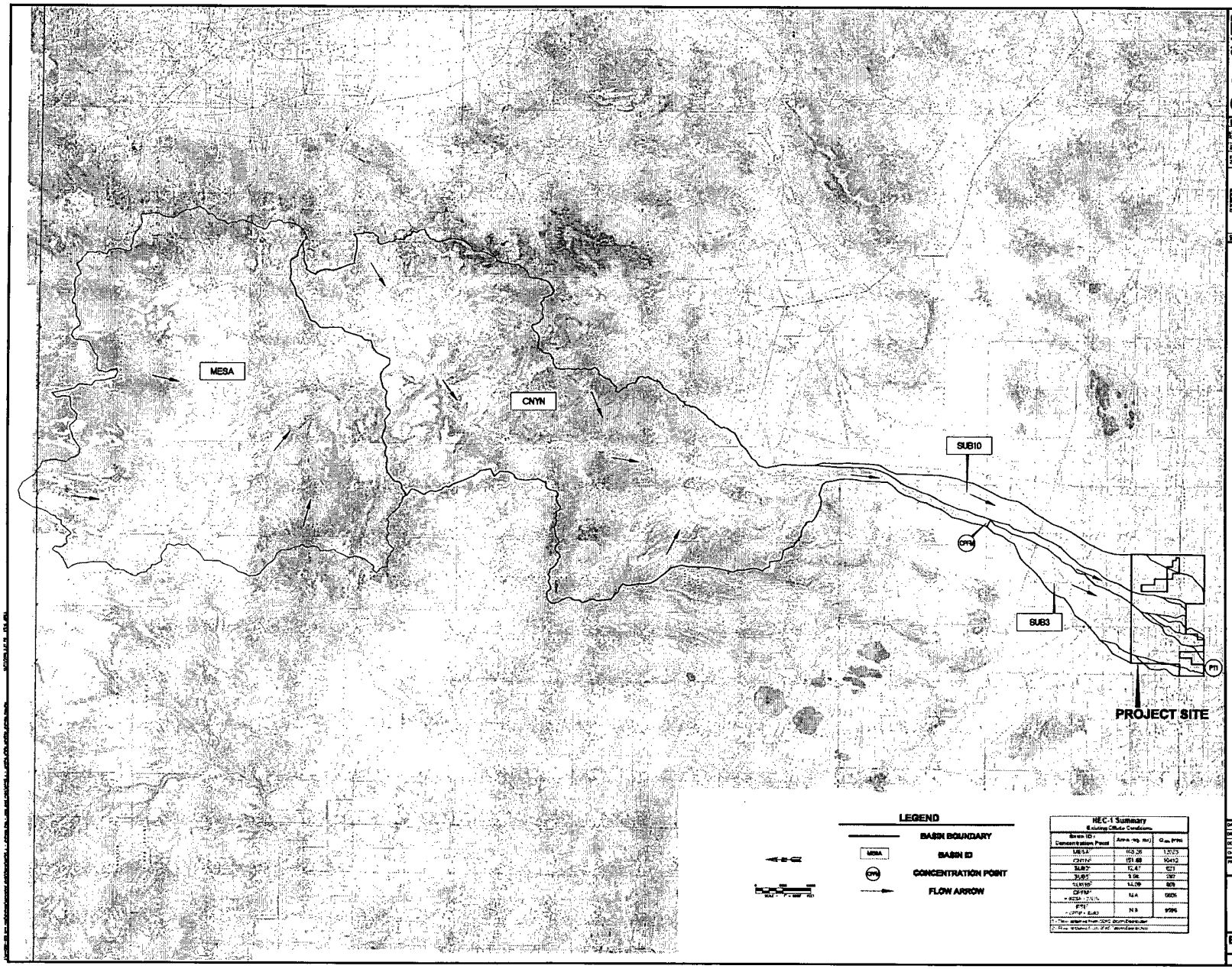

HEC-1 Summary
Existing Offsite Conditions

Basin ID / Concentration Point	Area (sq. mi.)	Q_{100} (cfs)
MESA[1]	103.36	12075
CNYN[1]	151.68	10412
SUB10[1]	12.47	621
SUB3[1]	3.96	287
SUB10[2]	14.09	809
CPFM[2] = MESA + CNYN	N/A	9806
PT1[2] = CPFM + SUB3	N/A	9796

1 - Flow assumed from SDFC Storm Distribution
2 - Flow assumed from SDFC Storm Distribution

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

NO.	DESCRIPTION	DATE	BY	CK.	APP.

SOLAR MILENNIUM, LLC
AMARGOSA FARM ROAD SOLAR PROJECT
EXISTING CONDITION OFFSITE DRAINAGE MAP

DATE: 11/26/08
DRAFTER: SMJ
DESIGNER: SMJ
CHECKED: SMJ
PROJECT NO.
[illegible]

EXHIBIT C
SHEET 1 OF 1

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Appendix F

Nye County Development Agreement

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BILL NO. 2010-10

NYE COUNTY ORDINANCE NO. 390

SUMMARY: An Ordinance adopting a Development Agreement with Amargosa Valley Solar 1, LLC for the Development of Two 242 Mega Watt Solar Power Plants.

TITLE: AN ORDINANCE ADOPTING A DEVELOPMENT AGREEMENT WITH AMARGOSA VALLEY SOLAR 1, LLC FOR THE DEVELOPMENT OF TWO 242 MEGA-WATT SOLAR POWER PLANTS ON PROPERTY LOCATED WITHIN THE TOWN OF AMARGOSA VALLEY, NYE COUNTY, NEVADA; AND PROVIDING FOR OTHER MATTERS PROPERLY RELATING THERETO.

THE BOARD OF COMMISSIONERS OF THE COUNTY OF NYE, STATE OF NEVADA, DOES HEREBY ORDAIN:

1. In accordance with the provisions of Section 278.0203 of the Nevada Revised statutes and Chapter 16.32 of the Nye County Code, a development agreement for the siting and development of two (2) 242 mega-watt solar power plants within the Town of Amargosa Valley, County of Nye is hereby adopted.

2. Severability. If any provision of this Ordinance or amendments thereto, or the application thereof to any person, thing or circumstance is held to be invalid, such invalidity shall not affect the validity of provisions or applications of this Ordinance or amendments thereto which can be given effect without the invalid provisions or applications, and to this end the provision of this Ordinance and amendments thereto are declared to be severable.

3. Constitutionality. If any section, clause or phrase of this Ordinance shall be declared unconstitutional buy a court of competent jurisdiction, the remaining provisions of this Ordinance shall continue in full force and effect.

4. Effective Date. This Ordinance shall be in full force and effect from and after passage, approval, and publication as required by law, to wit, from and after the 1st day of July, 2010.

Proposed on the 4th day of May, 2010.

Proposed by Commissioner: Eastley.

Adopted on the 1st day of June, 2010.

Vote:	Ayes:	#	Commissioners:	Hollis, Borasky, Eastley, Wichman, Quitevis
	Nays:	#	Commissioners:	None
	Absent:	#	Commissioners:	None

Gary Hollis, Chairman
Nye County Board of
County Commissioners

Sandra "Sam" L. Merlino
Nye County Clerk and Ex-Officio
Clerk of the Board

A DEVELOPMENT AGREEMENT

BY AND BETWEEN

NYE COUNTY,

AND

AMARGOSA VALLEY SOLAR 1, LLC

Adopted June 1, 2010

Effective July 1, 2010

862936.25

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This Development Agreement (the "Agreement") is made and entered into this 1st day of June, 2010 by and between the County of Nye, State of Nevada (hereinafter "County") and Amargosa Valley Solar 1, LLC. (hereinafter "Developer"), as the Developer of the Amargosa Valley Solar Power Project (the "ASPP").

RECITAL OF PREMISES, PURPOSE AND INTENT

A. Developer or its affiliate controls or has a right of way application with the BLM to develop and operate the ASPP on that certain real property described and shown on Exhibit "A" attached hereto and incorporated herein by reference (hereinafter the "Property") containing approximately 6,360 acres of land, which is the subject of this Agreement. Developer desires to construct a renewable energy project on the Property.

B. The County has authority, pursuant to NRS Chapter 278.0201 to 278.0207 and Nye County Nye County Code, Chapter 16.32, to enter into development agreements with persons having a legal or equitable interest in real property to establish long-range plans for the development of such property.

C. All preliminary processing with regard to this Agreement has been duly completed in conformance with all applicable laws, rules and regulations. The Nye County Board of County Commissioners (hereinafter "BoCC"), having given notice as required by law, held a public hearing on June 1, 2010, to consider Developer's application seeking approval of the form of this Agreement and the execution hereof by the BoCC. At that hearing, the BoCC found that this Agreement is consistent with the County's plans, policies and regulations, including the Amargosa Valley Area Plan and the Master Plan, and that the execution of this Agreement on behalf of the County is in the public interest and is lawful in all respects.

D. On the 1st day of June, 2010the BoCC adopted Ordinance No. 390 approving this Agreement and authorizing the execution hereof by duly constituted officers of the County. Said ordinance took effect on the 1st day of July, 2010. The County agrees to record a certified copy of the ordinance as required by NRS Chapter 278.

E. The County desires to enter into this Agreement in conformance with the requirements of NRS Chapter 278, and as otherwise permitted by County Code, law and this Agreement, to ensure the land use impacts on public services in connection with the Proposed Development are mitigated, as limited to and

further defined within specific exhibits attached hereafter, to further the goals and values of the Amargosa Valley Area Plan and the Master Plan, to promote the health, safety and general welfare of the County and its inhabitants, to minimize uncertainty in planning for and securing orderly development of the Property and surrounding areas, to insure attainment of the maximum efficient utilization of resources within the County in a way that provides the highest economic benefit and least fiscal cost to its citizens, and to otherwise achieve the goals and purposes for which the laws governing development agreements were enacted. The conditions stated in this Agreement will reasonably mitigate the land use impacts that the development of the Property will have on the citizens of Nye County. The County and Developer acknowledge that the conditions of this Agreement were not an inducement for any other land use decision relating to the Property or other action by the County.

The County finds and determines, and the Developer agrees, that the conditions established in this agreement are unique to the Proposed Development and were negotiated at arms length between the County and the Developer, and that the conditions of this Agreement have no binding or precedential effect with regard to future development agreements in the County, and cannot be relied upon by the parties to this Agreement, or future applicants for rezoning, subdivision plat, or other land use approvals in other development agreements.

This Agreement is consistent with and will implement the goals and objectives of the County Code generally, Title 16 Chapter32 specifically, the Amargosa Valley Area Plan and the Master Plan.

NOW THEREFORE, for and in consideration of the foregoing recitals and of the mutual covenants and promises set forth herein, the parties do hereby agree as follows:

SECTION 1. DEFINITIONS.

For all purposes of this Agreement, except as otherwise expressly provided or unless the context otherwise requires, the following terms shall have the following meanings:

"Affiliate" means an entity, partnership or corporation which Developer controls, or in which Developer has a controlling interest or which controls Developer.

"Agreement" has the meaning assigned to it in the first paragraph hereof, and at any given time includes all addenda and exhibits incorporated by reference and all amendments which hereafter are duly entered into in accordance with the terms of this Agreement.

"Applicable Rules" means and refers to:

1. The following provisions of the Nye County Code, as it existed on the Effective Date:

   a) Nye County Code, Title 15, Chapters 15.12 (Flood Damage Prevention), 15.16 (Uniform Construction Codes) and 15.20 (Board of Building and Safety Appeals) as may be amended at any time during the term of this Agreement by building codes that apply uniformly throughout the County; and

   b) Title16; and

2. This Agreement.

The term "Applicable Rules" does not include:

1. Any ordinances, laws, policies, regulations or procedures adopted by a governmental entity other than the County;

2. Any fee or monetary payment prescribed by County ordinance which is uniformly applied to development and construction similar to the Proposed Development and subject to the County's jurisdiction, including any increase of fees or monetary payments that are cost-based and uniformly applied to all development and construction within the County or a designated service area. This Definition does not preclude the County obtaining full cost recovery for any cost-based services or infrastructure that are based on variables such as inflation, construction and consumer price indexing to the extent permitted by Nevada or federal law; or

3. Any applicable state or federal law or regulation.

"BLM" means the Bureau of Land Management.

"BoCC" means the Board of County Commissioners.

"Code" means the Nye County Code, as amended by Nye County Ordinances and Resolutions adopted by the BoCC, and including all rules, regulations, standards, criteria, manuals and other references adopted therein.

"County" means the County of Nye, State of Nevada, together with its

successors and assigns.

"Developer" means Amargosa Valley Solar 1, LLC., as the Developer of the land constituting the Property and its successors and assigns, if any, as permitted under the terms of Section 3.8 of this Agreement.

"Discretionary Approval" means an approval that involves the exercise of significant and extensive factual or legal judgment by the County.

"Effective Date" means the effective date of an ordinance adopted by the BoCC that approves the execution of this Agreement.

"Engineering Standards" means those uniform standards adopted by the County for the design of roads, drainage, and other infrastructure, as may be amended from time to time. The Engineering Standards are currently set forth in the "Guidelines for Design and Review of Development Engineering Submissions," pursuant to Nye County Resolution 2005-02.

"Land Use Application" means any application seeking any approval authorized or required by the Applicable Rules.

"Land Use Plan" means the drawings and specifications attached in Exhibit B.

"Landscape and Buffer Plan" means the drawings and specifications attached in Exhibit C.

"Master Plan" means the 1994 Nye County Comprehensive Plan dated May 3, 1994.

"Master Traffic Impact Analysis" means a comprehensive traffic study prepared in conformance with this Agreement, as amended or conditioned and finally approved by the County.

"NRS" means the Nevada Revised Statutes.

"Planning Department" means the Planning and Development Department of the County.

"Planning Director" means the Director of the County's Planning Department, or his or her designee(s).

"Property" means that certain real property as shown on Exhibit "A".

"Proposed Development" means all development within the boundaries

depicted in Exhibit A, as further described in Exhibits B-E.

"Public Works Director" or "Director of Public Works" means the Director of the County's Department of Public Works or their designee(s).

"Technical Drainage Study" means a study prepared in conformance with this agreement, as amended or conditioned and approved by the County.

"Town Advisory Board" means the Amargosa Valley Town Advisory Board.

"Uniform" means applicable throughout the County.

SECTION 2. GENERAL PURPOSE AND INTENT.

This Agreement is predicated upon the following facts and findings:

2.1 County Intent.

The County desires to enter into this Agreement in conformity with the requirements of NRS 278.0201 and as otherwise permitted by law and this Agreement to provide for public services, public uses and impact mitigation, to promote the health, safety and general welfare of the County and its inhabitants, to minimize uncertainty in planning for and securing orderly development of the Proposed Development and surrounding areas, to insure attainment of the maximum efficient utilization of resources within the County in a way that provides the highest economic benefit and least fiscal cost to its citizens, to reasonably mitigate the impacts that the development of the Property will have on the citizens and lands of Nye County, and otherwise achieve the goals and purposes for which the laws authorizing development agreements were enacted.

2.2 Developer Intent.

In accordance with the legislative intent evidenced by NRS Chapter 278, Developer wishes to obtain reasonable assurances that Developer may develop the Proposed Development in accordance with the conditions established in this Agreement. Developer acknowledges that there may be certain insufficient public services, which includes facilities and infrastructure, existing or planned at this time, and in order to develop the Proposed Development, Developer is willing to enter into this Agreement in order to provide certain public services, facilities and infrastructure in the area of the Proposed Development. The Developer's decision to commence development of the Proposed Development is based on expectations of proceeding and the right to proceed with the Proposed Development in accordance with this Agreement and the Applicable Rules. Developer further acknowledges that this Agreement was made a part of

the record at the time of its approval by the BoCC and that the Developer agrees without protest to the requirements, limitations, or conditions imposed by this Agreement.

2.3 Incorporation of Recitals.

The foregoing recitals shall be deemed true and correct in all respects with respect to this Agreement and shall serve as the basis for the interpretation of this Agreement.

SECTION 3. GENERAL PROVISIONS.

3.1 Binding Agreement.

This Agreement shall be binding on and inure to the benefit of the parties hereto and their successors and assigns, including any future and subsequent purchasers.

3.2 Reliance on the Applicable Rules.

The County and Developer agree that Developer will be permitted to complete the entire Proposed Development in accordance with this Agreement and the Applicable Rules.

3.3 Modification of Applicable Rules.

County and Developer acknowledge and agree that this Agreement is specific to the Proposed Development and may not be amended, modified or changed with respect to the Proposed Development without the express written consent of Developer and County, except as otherwise explicitly provided in this Agreement and by state statute. In the event the County adopts new ordinances, rules or regulations, such new ordinances, rules or regulations will not apply to the Proposed Development for the duration of this Agreement except as provided herein.

3.4 Application of Subsequently Enacted Rules.

Except as expressly provided by this Agreement, County hereby agrees that no standard, policy, resolution or regulation regarding infrastructure improvements, subdivision, land use, zoning, growth management, timing and phasing of construction, or construction methods shall be imposed by the County upon the Proposed Development, except those in effect at the time of this Agreement. County may hereafter, during the term of this Agreement, apply to the Proposed Development only those rules, regulations, ordinances, laws, general or specific plans, and official policies promulgated or enacted after the Effective Date that:

(a) are not in conflict with the Applicable Rules, or

(b) that are permitted by subsection 3.5, below.

3.5 Imposition of New Fees or Standards.

Notwithstanding the terms of Section 3.3 and 3.4, above:

(a) The Proposed Development is subject to all of the following regulations, fees, or other requirements in effect now or in the future:

(1) uniform cost-based fees subject to any credits or offsets required by the fee ordinances or Nevada law; and

(2) except as provided herein, all regulations governing construction standards and specifications including, without limitation, the County's building code, plumbing code, mechanical code, electrical code, fire code and grading code, and all other uniform construction codes then applicable in the County; and

(3) uniform processing fees and charges of every kind and nature imposed by the County to cover the estimated actual costs to the County of processing applications for Permits or for monitoring compliance with any Permits granted or issued; and

(4) uniform estimated costs for completing required public improvements that are used to calculate costs for maintenance or warranty guarantees, bonds, or other guarantees or assurances to complete the public improvements that are required for the Proposed Development; and

(5) except as provided herein, uniform procedural regulations relating to hearing bodies, petitions, applications, notices, findings, records, hearings, reports, recommendations, appeals and any other matter of procedure, provided such procedures are uniformly applied throughout the County to all substantially similar types of development projects and properties; and

(6) the Engineering Standards; and

(7) uniform laws and regulations that are reasonably necessary to protect the public health, safety or welfare; and

(8) new or changed County ordinances, regulations, plans or policies specifically mandated and required by changes in state or federal laws or regulations. In such event, the provisions of Section 3.6 and 3.7 of this Agreement are applicable.

(b) Notwithstanding the foregoing, should the County adopt or amend new standards, ordinances, rules, regulations or policies that exceed the limitations of Section 3.5(a), County shall provide written notice to Developer within thirty (30) days of adoption or amendment of the same to allow Developer sufficient time to conduct due diligence. If the County provides the above stated notice, Developer may reject such new or amended matters by giving written notice to County. If Developer fails to give such written notice within forty-five (45) days of receipt of notice by the County, such ordinances, rules, regulations or policies are deemed accepted by the Developer. County and Developer shall execute a supplement to this Agreement evidencing Developer's acceptance of any new or amended ordinance, rule, regulation or policy.

3.6 Conflicting Federal or State Rules.

In the event that any conflicting federal or state laws or regulations, enacted after the Effective Date, prevent or preclude compliance with one or more provisions of this Agreement or require changes in plans, maps or permits approved by the County, this Agreement shall remain in full force and effect as to those provisions not affected.

3.7 Cooperation in Performance.

The parties hereto agree to cooperate with each other in good faith and to take such additional actions, including the execution and delivery of documents and instruments, as may be necessary or appropriate, to fully effectuate and carry out the terms, provisions, purposes and intent of this Agreement. Without limiting the foregoing, County agrees that it will not object to any applicable federal and state approvals required for the Proposed Development without first notifying Developer of its objection. The Developer shall not have a right to obtain any Discretionary Approval from the County, however it shall not be unreasonably withheld from the Developer.

3.8 Assignment.

The Developer shall not sell, transfer, ground lease or assign the Property or this Agreement in whole or in part to any person (other than an Affiliate of the Developer or in accordance with Section 3.8(f)), partnership, joint venture, firm, company or corporation (any of the foregoing, an "Assignee") without the written

consent of the County, which shall not be unreasonably withheld.

(a) The Assignee shall assume in writing all obligations of Developer hereunder, and provide substitute security in a form and an amount acceptable to the County for any security previously provided by Developer in compliance with the Applicable Rules, if any.

(b) The Assignee shall assume all duties and obligations of Developer.

(c) Documentation of the financial stability of any Assignee shall be provided to County prior to the assignment. The County, using reasonable financial criteria, will approve, approve with conditions, or disapprove such transfer in order to ensure that the Assignee has the same ability to fulfill the obligations of this Agreement as the Developer.

(d) Except as expressly provided herein, no assignment or transfer of any portion of the Proposed Development shall relieve Developer of its obligations hereunder, and such assignment or transfer shall be subject to all of the terms and conditions of this Agreement. The County may, in its reasonable discretion, release the Developer of one or more of such obligations in a writing agreed to and executed by the County.

(e) This subsection shall have no effect upon the validity of obligations recorded as covenants, conditions, restrictions or liens against parcels of real property.

(f) Subject to subsections (a) through (e) above, Developer has full discretion and authority to transfer, assign or encumber the Proposed Development or portions thereof to financing parties, in connection with financing transactions that are related to the Proposed Development, without the permission of or notice to County. All such financing transactions shall be subject to the terms and conditions of this Agreement.

3.9 Amendment of Agreement.

Except as otherwise permitted by NRS Chapter 278 and this Agreement, this Agreement may be amended from time to time upon the mutual written consent of the parties hereto. All proposed amendments shall be considered solely by the BoCC for adoption or rejection, provided however that the BoCC reserves the right to require the Developer to consult with the Town Advisory Board if a proposed amendment would, in the County's opinion, affect that entity.

3.10 Indemnity; Hold Harmless.

Except as expressly provided in this Agreement, Developer shall hold County, its officers, employees, and representatives harmless from liability for damage or claims for damage for personal injury, including death and claims for property damage which may arise from the direct operations of Developer or those of its employees, which relate to the development of the Proposed Development. Developer agrees to and shall defend County and its officers, employees, and representatives from actions for damages caused by reason of Developer's activities in connection with the development of the Proposed Development, provided that County gives prompt notice to Developer of such actions and claims and cooperates with Developer in the resolution of such actions and claims, including any settlement thereof. Developer agrees to provide and pay all costs, attorneys fees, and damages related to a defense for County in any legal action filed in a court of competent jurisdiction by a third party alleging any such claims or challenging the validity of this Agreement. The provisions of this Section shall not apply to the extent such damage, liability, or claim is proximately caused by the intentional or negligent act of County, its officers, agents, employees, or representatives.

3.11 Binding Effect of Agreement.

The burdens of this Agreement bind, and the benefits of this Agreement inure to, the parties' respective successors in interest and the Property which is the subject of this Agreement.

3.12 Relationship of Parties.

It is understood that the contractual relationship between County and Developer is such that Developer is not an agent of County for any purpose and County is not an agent of Developer for any purpose.

3.13 Entire Agreement.

This Agreement constitutes the entire understanding and agreement of the parties. This Agreement integrates all of the terms and conditions mentioned herein or incidental hereto and supersedes all negotiations or previous agreements between the parties with respect to all of any part of the subject matter hereof.

3.14 Waivers.

All waivers of the provisions of this Agreement must be in writing and signed by the appropriate officers of County and/or Developer, as the case may be.

3.15 Recording; Amendments.

Promptly after execution hereof, an executed original of this Agreement shall be recorded in the Official Records of Nye County, Nevada. Except as otherwise provided by NRS Chapter 278, all amendments hereto must be in writing signed by the appropriate officers of County and Developer in a form suitable for recordation in the Official Records of Nye County, Nevada. Upon completion of the performance of this Agreement, or its earlier revocation or termination, a statement evidencing said completion, revocation or termination shall be signed by the appropriate officers of the County and Developer and shall be recorded in the Official Records of Nye County, Nevada.

The Clerk of the Nye County Commission must record any agreement with a federal, state or local agency that is executed in full or partial fulfillment of any requirement of this Agreement, within a reasonable time after approval of the agreement, with the County Recorder. The Developer shall provide a true, signed original agreement to the Clerk of the Nye County Commission for this purpose.

3.16 Headings; Exhibits; Cross References.

The recitals, headings and captions used in this Agreement are for convenience and ease of reference only and shall not be used to construe, interpret, expand or limit the terms of this Agreement. All exhibits attached to this Agreement are incorporated herein by the references contained herein. Any term used in an exhibit hereto shall have the same meaning as in this Agreement unless otherwise defined in such exhibit. All references in this Agreement to sections and exhibits shall be to sections and exhibits to this Agreement, unless otherwise specified.

SECTION 4. PLANNING, DEVELOPMENT AND MAINTENANCE OF THE PROPOSED DEVELOPMENT.

4.1 Permitted Uses, Height and Size of Structures.

Pursuant to NRS Chapter 278, this Agreement must set forth the maximum height and size of structures to be constructed in the Proposed Development, the density of uses and the permitted uses of the land.

(a) The permitted structures and uses of the Property shall be those either depicted in Exhibit B or described in Exhibit D.

(b) Subject to modifications mutually agreeable to County and Developer, the Proposed Development shall comply with the Land Use Plan attached in Exhibit B hereto. Notwithstanding the above, where feasible, all administrative and service buildings constructed on the site

shall utilize colors to emulate the natural colors found in the surrounding area (a color palette of browns, tans, etc.).

(c) The parties agree that the Proposed Development will contain design elements to mitigate the visual impact of the project. Accordingly, subject to modifications mutually agreeable to County and Developer, the Proposed Development shall conform to the Landscape and Buffer Plan attached as Exhibit C.

(d) To the extent feasible, exterior lighting shall be directed downward and designed to minimize its impact on the dark-sky visual environment. Prior to commencement of construction, Developer shall provide the Planning Director a lighting plan for review.

(e) The Proposed Development must comply with any other requirements, limitations, or conditions imposed by this Agreement.

4.2 Effect of Amendments.

County acknowledges that Developer is anticipating that the entire Property will be developed in accordance with this Agreement and with any future amendments thereto, provided however, that the Proposed Development shall be developed in accordance with the Applicable Rules as set forth herein.

4.3 Modifications to the Proposed Development.

(a) A nonmaterial modification is a modification made by the Developer that:

(1) meets or exceeds the requirements of this Agreement;

(2) does not increase the amount of land area covered by this Agreement; and

(3) does not involve a substantial change to the Land Use Plan or the Landscape and Buffer Plan; and

(4) involves the rearrangement of uses or structures depicted in the Development Plan if such change is within the scope of the applicable state and federal approvals of the Proposed Development.

(b) Nonmaterial modifications shall be provided to the Planning Director for his or her information.

(c) A material modification includes any modification that does not qualify as a nonmaterial modification and shall be processed as an amendment to this Agreement.

4.4 Additional Property.

Developer may not include property outside the boundaries of the Proposed Development within the terms of this Agreement without the prior approval of the BoCC. If Developer requests additional property to be included, the BoCC must reconsider additional impacts of the proposed additional development and must ensure that all impacts are appropriately mitigated through Developer contributions, impact fees, and any other allowable revenue source. Furthermore, the BoCC reserves the right to adjust the terms of this Agreement as a condition for allowing the addition of property.

4.5 Processing of Applications.

(a) The County acknowledges the Developer's desire to have timely reviews of studies, maps, plans, applications for permits, Land Use Applications and other authorizations for development of and within the Proposed Development submitted by Developer (collectively, the "Applications"). The County Schedule (defined below) does not apply to the public hearing portion of any Application for which a public hearing is required under the Applicable Rules. Applications submitted to the County Planning Department shall be forwarded by the County to the Amargosa Valley Planning Committee for its information.

(b) The County deems the schedule ("County Schedule") set forth in the table below to be a reasonable estimate of time for the County to process Applications. Developer acknowledges that County's ability to process reviews in accordance with the County Schedule is based on Developer's quality of submission and timely and accurately addressing the written comments provided by the County with respect to such Applications. Should County reject any submission due to its lack of clarity and completeness, the submission will be returned to the Developer within the timeframes set forth in the County Schedule and the review time shall be restarted upon resubmission of complete submittals. The County Schedule is expressed in Business Days ("bd") from the date of a complete submittal. Failure of County to complete its review within the timeframes in the County Schedule shall not require the County to approve any of the Applications.

Category	1st Review	2nd Review	3rd and Subsequent Reviews*	Mylar/Map Signatures
1. Hydrology Studies	15 bd	10 bd	5 bd	N/A
2. Traffic Studies	15 bd	10 bd	5 bd	N/A
3. All other Land Use Applications	15 bd	10 bd	5 bd	5 bd

*If 3rd or subsequent review is required

(c) Developer shall have the option to request County to utilize a consulting firm or outside consultant ("Consultant") to process the Application at Developer's expense pursuant to the provisions of subsection (d) below. County may also, in its own discretion, utilize a Consultant.

(d) Whenever the Parties utilize a Consultant, the Consultant shall enter into a standard County professional services agreement governing the terms of their relationship ("Consultant Agreement"). The Consultant Agreement shall contain the following provisions:

(1) Developer shall pay cost of the Consultant; and

(2) The Developer shall have the right to evaluate the performance of the Consultant.

(e) The Parties' decision to use a Consultant does not extend the time frames set forth in the county Schedule without the mutual written agreement of the parties.

SECTION 5 REVIEW AND DEFAULT

5.1 Frequency of Reviews; Biennial Review.

Pursuant to NRS Chapter 278.0205.1 and Section 16.32.110 of the Code, the BoCC may, pursuant to written notice to Developer, review the development once every twenty-four (24) months during the term of this Agreement. In the event the BoCC provides such notice, Developer shall have sixty (60) days to provide a written report to BoCC containing information regarding the progress of development of the Proposed Development. In the event Developer fails to submit such a report, Developer shall be in default of this Agreement. If at the time of review an issue not previously identified in writing is required to be

addressed, the review at the request of either party shall be continued to afford reasonable time for response.

5.2 Opportunity to be Heard.

The report required by this Section shall be considered solely by the BoCC in accordance with the rules and procedures of Section 16.32 of the Nye County Code. County and Developer shall each be permitted an opportunity to be heard orally and in writing before the BoCC regarding performance of the parties under this Agreement.

5.3 General Provisions-Default.

In the event of any noncompliance with any provision of this Agreement, the party alleging such noncompliance shall deliver to the other in writing not less than thirty (30) days after the event of noncompliance a notice of default. The time of notice shall be measured from the date of certified mailing. The notice of default shall specify the nature of the alleged default and the manner and period of time in which the default may be satisfactorily corrected, during which period the party alleged to be in default shall not be considered in default for the purposes of termination or institution of legal proceedings. Such cure period shall not be less than sixty (60) days, nor exceed ninety (90) days. If the default is corrected within the period, then no default shall exist and the noticing party shall take no further action. If the default is not corrected, the party charging noncompliance may elect any one or more of the following courses.

(a) Option to Terminate. After proper notice and the expiration of the above-referenced period for correcting the alleged default, the party alleging the default may give (unless the default has been cured or waived prior to such date) notice of intent to amend or terminate this Agreement as authorized by NRS Chapter 278. Following any such notice of intent to amend or terminate, the matter shall be scheduled and noticed as required by law for consideration and review solely by the BoCC.

(b) Amendment or Termination by County. Following consideration of the evidence presented before the BoCC and a finding that a default has occurred by Developer and remains uncorrected, County may amend (pursuant to Section 3.9) or terminate this Agreement. In the event of default by Developer, County shall have the option, in its discretion, to maintain this Agreement in effect, and seek to enforce all of Developer's obligations hereunder under the procedures set forth in this Section and Section 5.5. County also reserves the right to terminate this Agreement and pursue collection and/or performance of any of Developer's obligations that were required by this Agreement up to the point of termination.

Termination shall not in any manner rescind, modify, or terminate any vested right in favor of Developer, as determined under the Applicable Rules and Nevada Law, existing or received as of the date of the termination and to the extent that Developer has performed its obligations under this Agreement. Developer shall have sixty (60) days after receipt of written notice of termination to institute legal action pursuant to Section 5.5 hereof.

(c) Termination by Developer. In the event County substantially defaults under this Agreement, Developer shall have the right to terminate this Agreement after the hearing set forth in this Section. Developer shall have the option, in its discretion, to maintain this Agreement in effect, and seek to enforce all of County's obligations hereunder under the procedures set forth in this Section and Section 5.5.

(d) Waiver. Failure or delay in giving notice of default shall not constitute a waiver of any default. Except as otherwise expressly provided in this Agreement, any failure or delay by any party in asserting any of its rights or remedies in respect of any default shall not operate as a waiver of any default or any such rights or remedies, or deprive such party of its right to institute and maintain any actions or proceedings that it may deem necessary to protect, assert, or enforce any of its rights or remedies.

5.4 Unavoidable Delay, Extension of Time.

Neither party hereunder shall be deemed to be in default, and performance shall be excused, where delays or defaults are caused by war, insurrection, strikes, walkouts, riots, floods, earthquakes, fires, casualties, acts of God, restrictions imposed or mandated by governmental entities, failure of governmental agencies (other than County) to perform acts or deeds necessary to the performance of this Agreement, enactment of conflicting state or federal laws or regulations, new or supplementary environmental regulations, litigation, or similar matters beyond the control of the parties ("Force Majeure"). In addition, nonperformance of a party hereunder shall be excused as a result of the failure of the other party to perform under this Agreement which failure of the other party actually causes such nonperformance. If written notice of any such delay is given to County within sixty (60) days after the commencement of a Force Majeure, an automatic extension of time, unless otherwise objected to by County within thirty (30) days of such written notice, shall be granted coextensive with the period of the Force Majeure, or longer as may be required by circumstances or as may be subsequently agreed to between County and Developer.

5.5 Legal Action.

County and Developer agree that they would not have entered into this Agreement if either were to be liable for damages under or with respect to this Agreement that would be greater than without this Agreement. Accordingly, County and Developer may pursue any course of action or equity available for breach, except that neither party shall be liable to the other or to any other person for any monetary damages for a breach of this Agreement that are greater than such damages or liability would have been without this Agreement pursuant to the Applicable Rules. Prior to the institution of any legal action, the party seeking legal action must give the thirty (30) day notice of default as set forth in Section 5.3. Following such notice, and the failure of the notified party to cure such non-compliance within the time period set forth in Section 5.3 , a public hearing must be held by the BoCC where the allegations will be considered and a decision regarding their merits will be reached. Any judicial review of this decision or any legal action taken pursuant to this Agreement will be heard by the court, and the decision of the BoCC shall be reviewed in conformance with Nevada law. Judicial review of the decision of the BoCC shall be limited to the evidence presented to the BoCC at the public hearing. Jurisdiction for judicial review or any judicial action under this Agreement shall reside exclusively with the Fifth Judicial District Court, State of Nevada.

5.6 Notices.

All notices required by this Section shall be sent in accordance with Section 9.

5.7 Applicable Laws; Attorneys' Fees.

This Agreement shall be construed and enforced in accordance with the laws of the State of Nevada. Each party shall bear its own attorneys' fees and court costs in connection with any legal proceeding hereunder.

SECTION 6. INFRASTRUCTURE OBLIGATIONS AND LAND USE MITIGATION MEASURES

6.1 Generally

(a) Developer shall provide the infrastructure and land use mitigation measures described in this Section.

(b) All bonds, including performance bonds, letters of credit and bank guarantees to be provided by Developer that are required to provide financial assurance for the provision or maintenance of infrastructure pursuant to this Section must be issued by an entity that has at least an AAA rating with A.M. Best, A- by Standard and Poors

or Baa3 by Moody's Investor Services, obtained by Developer to cover One Hundred and Fifteen percent (115%) of the estimated cost of infrastructure identified by any Master Studies or the County Engineer or his or her designee.

(c) Developer shall make a good faith effort to purchase a reasonable amount of goods related to operation of the facility from Nye County vendors; provided such goods are comparable in price, quality and availability to goods otherwise available for purchase by Developer and such goods are not subject to an exclusive purchasing contract. Developer shall conduct annual vendor information sessions in Nye County to educate vendors regarding Developer's procurement process.

To the extent allowed under applicable laws, Developer shall accept delivery of all construction and related materials within the boundaries of the Proposed Development. Notwithstanding the above, Developer shall pay a use tax in accordance with NAC 372.055 for any construction and related materials for which Developer cannot through reasonable diligence accept delivery at the Proposed Development, or such delivery would result in an unreasonable delay to the construction of the Facility. Provided, however, nothing in this paragraph shall require payment of a use tax to the extent Developer has been granted a partial abatement pursuant to NRS 701A.300 to 701A.390 (AB 522-2009-Sections 28 and 106.5). Developer shall provide County with copies of all sales tax filings it makes with the State of Nevada. County shall have the right to audit such filings to ensure compliance with the provisions of this Agreement.

(d) County acknowledges that certain rights-of-way and easements outside the boundaries of the Proposed Development may be necessary for development and construction of the improvements described in this Agreement. The County shall cooperate (including, where applicable, being the applicant for state and federal approvals) with Developer (at Developer's cost and expense) in obtaining such necessary rights-of-way and easements, so as not to delay development and construction of such improvements. In the event the parties are unable to obtain the necessary right-of-way or easement in the time or manner consistent with the Developer's obligation to complete the improvement, County and Developer may agree to adjust the timeline. In the alternative, and when supported in the studies contemplated by this Agreement, the parties may agree, in writing, that Developer may proceed with the

development and use of an alternative right-of-way or easement approved by County.

(e) Developer shall comply with the applicable provisions of NRS 361.157 and NRS 361.159.

(f) Prior to commencement of construction, Developer shall amend the boundaries of its BLM right of way application to remove all property east of the alignment of Williamson Road.

6.2 Emergency Services

(a) Facility Emergency Plan. Prior to accepting hazardous materials within the boundaries of the Proposed Development, Developer shall provide the County a facility emergency plan which contains:

1) a description of the training, equipment, facilities and procedures that will be used to respond to emergencies occurring within the boundaries of the Proposed Development; and

2) certification that such equipment, facilities and procedures have been approved by all applicable state and federal authorities.

(b) Response Protocols. County and Developer shall jointly develop emergency response protocols and shall jointly establish the respective responsibilities of the Parties.

(c) Sheriff. Within 60 days of obtaining financing for construction of the ASPP, and annually thereafter for the term of the Agreement, Developer agrees to pay County $20,000 for County's use in providing law enforcement services. County agrees to use such funds solely for the purpose of providing law enforcement services in the Town of Amargosa.

(d) Fire Protection Training. Developer shall annually, for as long as the ASPP is operating, provide emergency and fire protection training for up to four (4) individuals identified by County. County shall give priority to individuals who serve in the Amargosa Volunteer Fire Department. Such training shall be the equivalent of training provided to Developer's on-site personnel.

(e) Water Supply. Within 60 days of obtaining financing for construction of the ASPP, Developer shall provide County, in a location selected by Developer, for as long as the ASPP is operating, access to a water

supply for County's use in responding to fires within the Town of Amargosa. County agrees to utilize the water supply only for such purposes.

6.3 Medical Services

Within 60 days of obtaining financing for the construction, and annually thereafter for the term of the Agreement, Developer agrees to pay County $20,000 for County's use in providing staff and equipment for County's medical clinic for the benefit of community medical services. County agrees to use such funds solely for such purpose.

6.4 Water.

The parties acknowledge that the Developer will have adequate water rights for the Property and the County has no role in the allocation of water. Developer shall advise County of all applications it files for state or federal approval of the appropriation and use of water for the Proposed Development.

6.5 Sanitary Sewer.

(a) Developer shall provide sanitary sewer system facilities as needed to mitigate the impacts of the Proposed Development. County has no obligations, and is not obligated to pay any financial costs, associated with obtaining the construction or maintenance of sanitary sewer facilities or the acquisition of rights-of-way, permits, easements, or other interests not owned by Developer necessary to construct the facilities required in this Section.

(b) With respect the location, design and operation of any proposed wastewater treatment facility, the Developer shall ensure full compliance with applicable Nevada State laws and regulations, and in particular, the implementation of NAC 445A.285 and Nevada Division of Environmental Protection WTS-21.

6.6 Transportation.

(a) Traffic Studies. Prior to commencement of construction, Developer shall submit a Master Traffic Impact Analysis for review and approval by County. The Analysis shall address the impacts, if any, of the transportation of employees to and from the Proposed Development. Developer shall provide the improvements required in the approved Master Traffic Impact Analysis in order to mitigate

the land use impacts of the Proposed Development.

(b) Valley View Boulevard. Developer will improve Valley View Boulevard (the "Access Road"), in accordance with the approved Master Traffic Impact Analysis. County agrees that, until such time as the Access Road is completed and available for use, Developer can utilize other access routes depicted on Exhibit E. Upon completion of construction of the Proposed Development, Developer shall restore the Access Road to the standards prescribed in the Master Traffic Impact Analysis.

(c) Realignment of Amargosa Farm Road. Developer, at its cost, shall realign Amargosa Farm Road in conformance with the Land Use Plan. The current alignment of Amargosa Farm Road shall remain open and available for use by the general public until construction of the new alignment is complete. Upon completion of construction of the new alignment: 1) Developer shall dedicate or otherwise transfer rights to the new alignment to County; and 2) County shall vacate or abandon its interests in the old alignment.

(d) Reimbursement for Cost to Construct the Access Road. County acknowledges that the Access Road may provide benefit to property outside the Proposed Development. Therefore, County agrees to require, as allowed by law, as a condition to development of any such benefitting properties, that the proponent of the development reimburse a prorata share of Developer's cost to improve and restore the Access Road. If reimbursements are made, County either will collect them from other benefitting properties and reimburse Developer in an amount equal to such reimbursements or facilitate direct payment to Developer, as allowed by law. For purposes of this subsection, the Access Road shall be deemed to provide a benefit to property if based on applicable law, either: 1) the property takes access to or from the Access Road; or 2) the proposed development will create significant traffic that will use the Access Road.

6.7 Storm Drainage

(a) Technical Drainage Study. Prior to commencement of construction, Developer will submit to the County a Technical Drainage Study for the Proposed Development for review and approval by the County. Developer shall provide the improvements required in the approved Technical Drainage Study in order to mitigate land use impacts of the Proposed Development.

(b) Maintenance and repair of all proposed easements for drainage/utility use shall be the sole responsibility of the Developer. The Developer shall provide a maintenance bond or letter of credit to the County to guarantee maintenance and repair of all drainage and storm water management facilities and utility easements while this Agreement is effective or while Developer has the right to use the Property, whichever is longest. The amount of the security shall be a minimum of 115% of estimated costs.

6.8 Assurance for Completion and Maintenance of Improvements.

Developer shall provide performance bonds or irrevocable commercial letters of credit for all roadway and storm drainage improvements that are identified in this Agreement and/or through an approved Master Traffic Impact Analysis and the approved Technical Drainage Study. Such bond amounts or letters of credit shall reflect 115% of the total estimated cost for the work to be done by Developer under this Agreement as determined or approved by the Director of Public Works, and shall be adjusted no less frequently than every two years, for inflation and escalation in construction cost using a published and generally accepted cost index.

6.9 Maintenance of Landscape Buffer Improvements.

Developer may, at its option, subject to approval of County, transfer maintenance of some or all of the improvements shown on the Landscape and Buffer Plan to County. In such event, the Parties shall execute a license and maintenance agreement or other binding documentation, which shall require Developer to reimburse County for its annual costs to complete the maintenance.

6.10 Limitation on Developer's Obligations

Except for the payment of applicable sales and property taxes (less allowable reductions and abatements), Developer shall have no obligation to participate in, pay, contribute or otherwise provide any further exaction, including assessments or fees, or to provide facilities or improvements beyond those specifically identified in this Section.

SECTION 7. EMPLOYMENT

The parties agree that the provision of employment opportunities for local and County residents will assist in mitigating the impacts of the Proposed Development, and acknowledge that the Developer has an incentive to hire local or County residents. Accordingly, Developer agrees that, during operations, it will use commercially reasonable efforts to ensure that a significant portion of the personnel employed and assigned to the project will be full time employees with benefits. Developer further agrees that it will conduct public meetings in the Town of Armagosa to provide information about employment opportunities relating to the Proposed Development: 1) at least twice prior to commencement of construction; and 2) at least twice prior to commencement of operations. Developer further agrees to assist the Great Basin Community College in developing a curriculum to train potential employees.

Subject to all applicable legal requirements, conditions of financing, and other requirements applicable to the ASPP, including but not limited to Department of Energy Loan Guarantee requirements, Davis-Bacon and related Acts, and any other applicable requirements, Developer will make commercially reasonable efforts to hire applicants who reside in Nye County for the construction and operations of the ASPP and to request its contractors and subcontractors for the construction and operations of the ASPP to do the same, provided that such applicants are in Developer's sole discretion qualified for such employment. Developer will provide County prior notice of its intent to enter into any labor agreement for the construction or operation of the ASPP.

SECTION 8. CONSTRUCTION STANDARDS AND INSPECTIONS

8.1 Construction Standards.

(a) County and Developer acknowledge that construction of the Proposed Deveopment will be governed by specialized state and federal codes and regulations (the "Construction Standards"). It is the parties' intent to establish a procedure for certifying compliance with the Construction Standards that minimizes unnecessary delay and cost to both County and Developer.

(b) Prior to commencing construction, Developer shall provide County:

1) a description of the applicable Construction Standards;

2) a list of the state, federal and other authorities responsible for ensuring compliance with the Construction Standards;

3) the qualifications needed for a person to inspect construction within the Proposed Development and to certify compliance with the Construction Standards; and

4) a copy of all construction plans and drawings prepared for use in certifying compliance with the Construction Standards.

8.2 Inspection and Certification.

Developer shall have construction within the Proposed Development inspected by an independent consultant with the qualifications set forth in section 8.1 (b) (3) above. Upon completion of each inspection, Developer shall provide County a certification from the consultant that the construction complies with the Construction Standards.

8.3 Conflict with Applicable Rules.

To the extent that the Construction Standards conflict with the Applicable Rules, the Construction Standards shall control. The provisions of Chapters 15.16 and 15.20 of the Code shall govern only if: I) the proposed construction activity is specifically governed by those chapters; and II) the activity is not governed by the Construction Standards.

SECTION 9. NOTICES/RECORDATION.

9.1 All notices, demands and correspondence required or provided for under this Agreement shall be in writing and delivered in person or mailed by express mail or certified mail postage prepaid, return receipt requested. Notices shall be addressed as follows:

To County:

County of Nye,
A political subdivision
250 N. Hwy 160, Suite 1
Pahrump, Nevada 89048
Attention: Planning Director

To Developer:

Amargosa Valley Solar 1, LLC
1625 Shattuck Avenue
Suite 270
Berkeley, CA 94703

With Copy to: Solar Millennium, LLC
Attention: Legal Counsel
1625 Shattuck Avenue
Suite 270
Berkeley, CA 94703

Either party may change its address and/or contact persons by giving notice in writing to the other and thereafter notices, demands and other correspondence shall be addressed and transmitted to the new address. Notices given in the manner described shall be deemed delivered on the day of personal delivery or the date delivery of mail is first attempted.

9.2 Recording. Promptly after execution hereof, County shall record an executed original of this Agreement in the Official Records of Nye County, Nevada. Upon completion of the performance of this Agreement, or its earlier expiration, revocation or termination, a statement evidencing said completion, revocation or termination shall be signed by the appropriate officers of the County and Developer and shall be recorded in the Official Records of Nye County, Nevada.

SECTION 10. SEVERABILITY OF TERMS.

If any term or other provision of this Agreement is held to be invalid, illegal or incapable of being enforced by any rule of law or public policy, all other conditions and provisions of this Agreement shall nevertheless remain in full force and effect, provided that the invalidity, illegality or unenforceability of such terms does not materially impair the parties' ability to consummate the transactions contemplated hereby. If any term or other provision is invalid, illegal or incapable of being enforced, the parties hereto shall, if possible, amend this Agreement so as to affect the original intention of the parties.

SECTION 11. DURATION OF AGREEMENT.

11.1 Except as provided herein, this Agreement shall expire 5 years after the Effective Date.

11.2 Developer may terminate this Agreement any time prior to commencement of construction by delivering written notice to County that Developer was unable to obtain financing or any required state or federal approval of the Proposed Development.

11.3 The BoCC may, in its reasonable discretion, extend the term of this

Agreement upon the following conditions:

(a) Developer provides written notice of its desire for an extension to County prior to the expiration of the original term of this Agreement; and

(b) Developer is not in default of this Agreement.

11.4 When approved by the BoCC, the extension shall be granted in writing after:

(a) notice of intention to amend the Agreement has been published as provided in NRS 278.0205; and

(b) the BoCC has approved an ordinance approving the extension that includes:

(1) a statement of the justification for the extension; and

(2) the duration of the extension; and

(3) any further conditions agreed to by the BoCC and the applicant, which conditions may be incorporated by reference in the ordinance.

11.4 Expiration of this Agreement, or any extension thereof, shall not in any manner affect Developer's right to operate the ASPP, and shall not rescind, modify or terminate any vested right in favor of Developer, as determined by Nevada law, to the extent that Developer has performed its obligations under this Agreement.

Permanent cessation of operations and decommissioning of the ASPP shall be done in compliance with all applicable state and federal permits and regulations.

In Witness Whereof, this Agreement has been executed by the parties on the day and year first above written.

COUNTY:	DEVELOPER:
Board of County Commissioners	Amargosa Valley Solar 1, LLC.
By: Gary Hollis	By:

Name: Josef Eichhammer

Approved as to Form:

Title: CEO

SUBSCRIBED AND SWORN TO before me
on this 28, day of June, 2010.

Attest:

County Clerk

By: [signature], Deputy Con

Notary Public in and for said County and State Contra Costa County CALIFORNIA

ANTOINETTE JONASSON
COMM. # 1707057
NOTARY PUBLIC - CALIFORNIA
CONTRA COSA COUNTY
My Comm Expires Nov. 24, 2010

EXHIBIT A

Legal Description and Map Showing Boundaries of Property Subject To Agreement

EXHIBIT B

Land Use Plan

EXHIBIT C

Landscape and Buffer Plan

EXHIBIT D

Description of Project/Permitted Uses

EXHIBIT E

Map Showing Access Routes

EXHIBIT A

LEGAL DESCRIPTION

AND

MAP SHOWING BOUNDARIES OF PROPERTY SUBJECT TO AGREEMENT

Legal Description of Property

TOWNSHIP 16 SOUTH, RANGE 48 EAST, MOUNT DIABLO MERIDIAN

SECTION 1 - ALL
SECTION 2 - EAST 1/2
SECTION 11 - EAST 1/2
SECTION 12 - ALL
SECTION 13 - WEST 1/2, NW 1/4 SE 1/4, SW 1/4 NE 1/4, N 1/2 NE 1/4
SECTION 14 - W 1/2, W 1/2 NE 1/4 , (NE 1/4 NE 1/4 PRIVATE PARCEL)

TOWNSHIP 16 SOUTH, RANGE 49 EAST, MOUNT DIABLO MERIDIAN

SECTION 5 - WEST 1/2
SECTION 6 - ALL
SECTION 7 - ALL
SECTION 8 - W 1/2, SE 1/4
SECTION 9 - SW 1/4 SW 1/4
SECTION 16 - W 1/2, NE 1/4 NE 1/4, S 1/2 NE 1/4, SE 1/4
SECTION 17 - ALL
SECTION 18 - N 1/2 NW 1/4, N 1/2 NE 1/4

ALL LANDS LYING IN NYE COUNTY, NEVADA

Map Showing Boundaries of Property Subject to Agreement

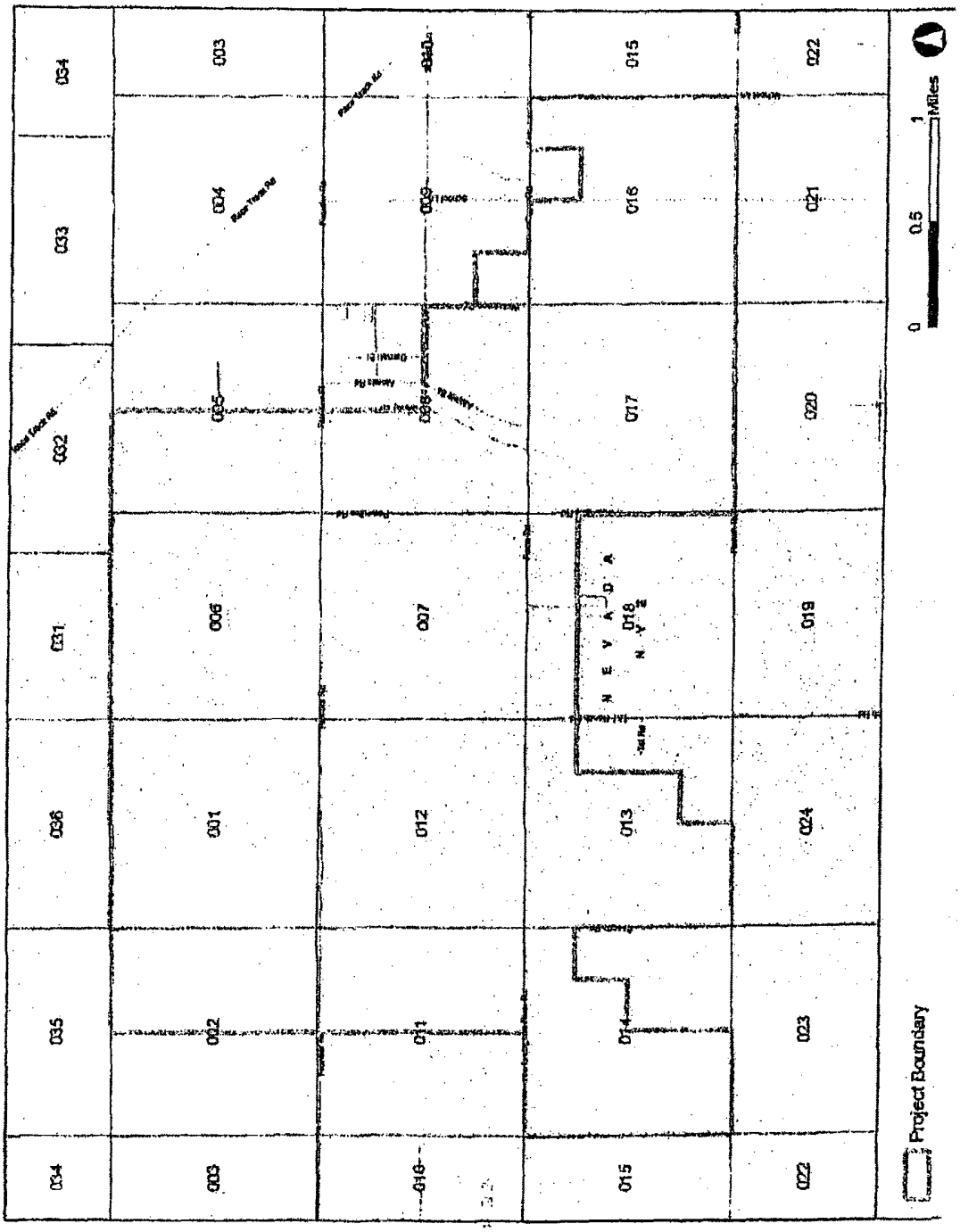
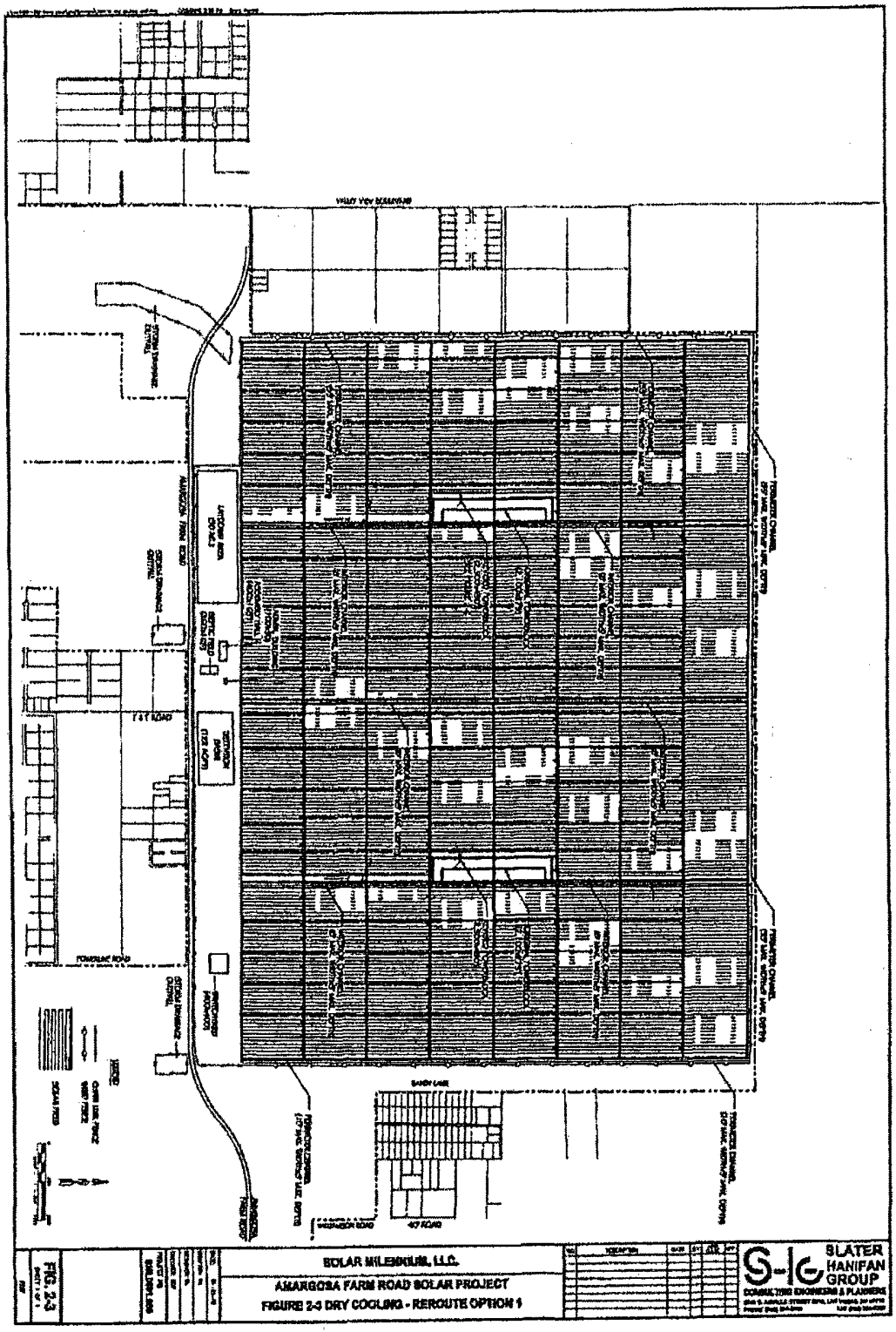
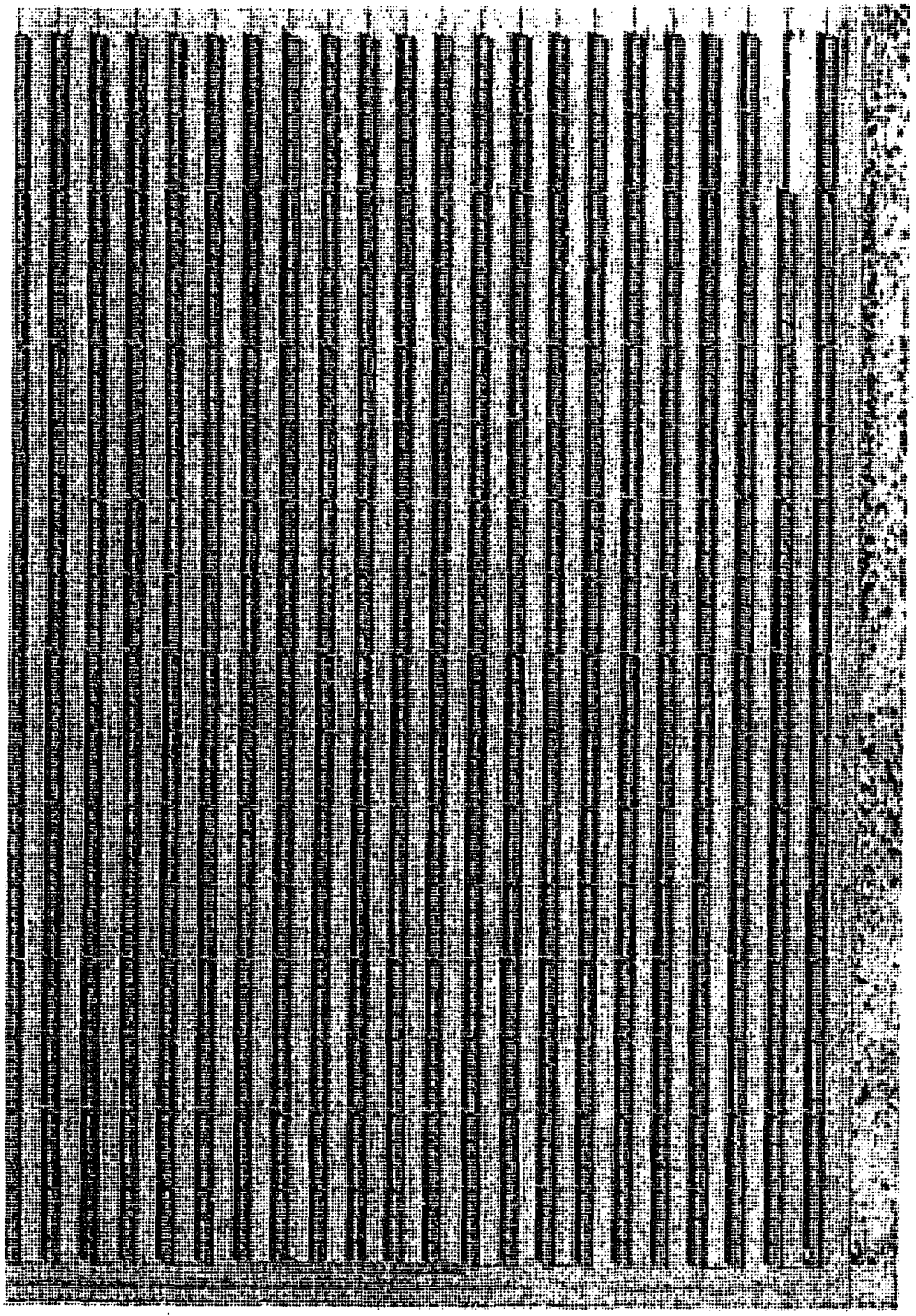
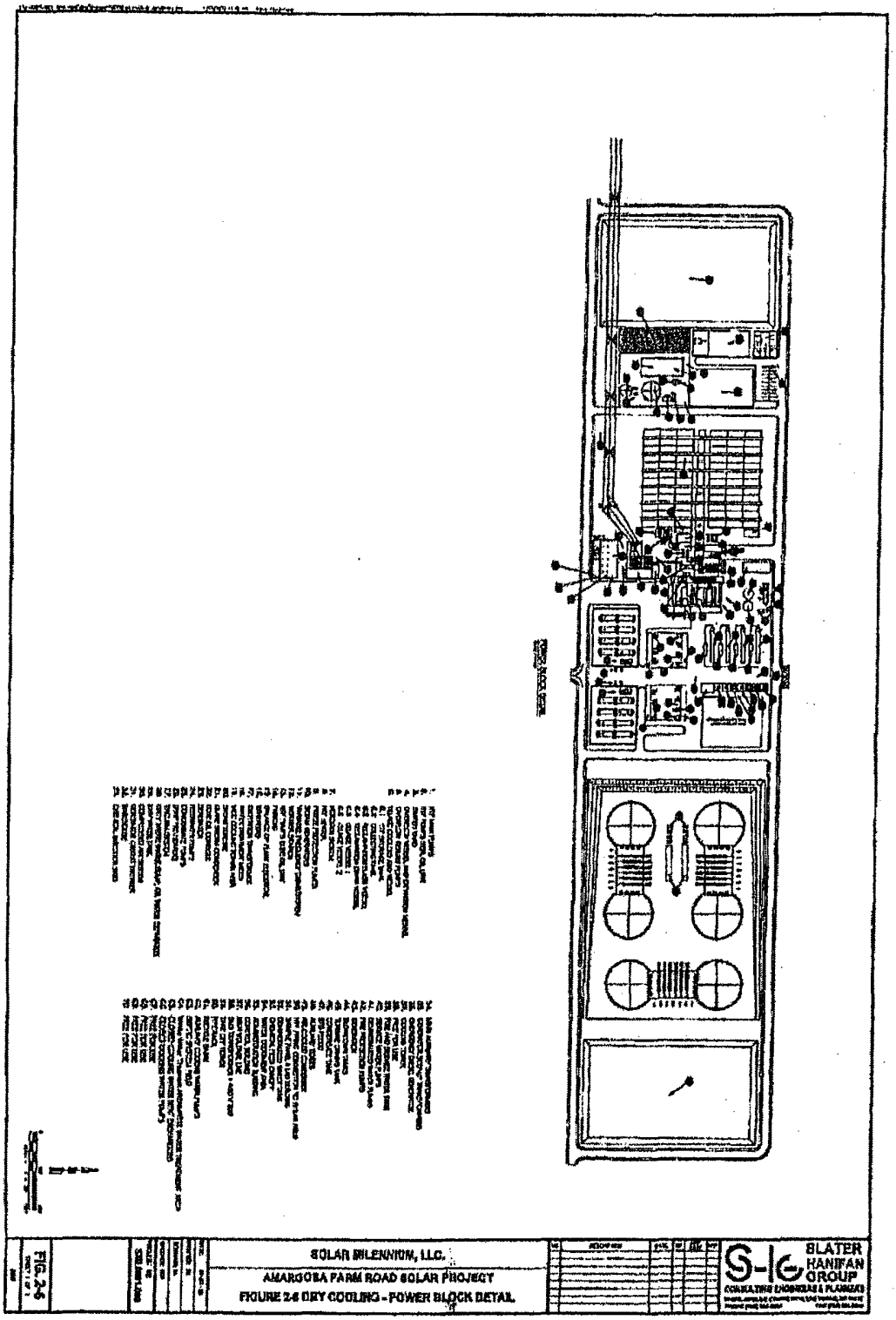


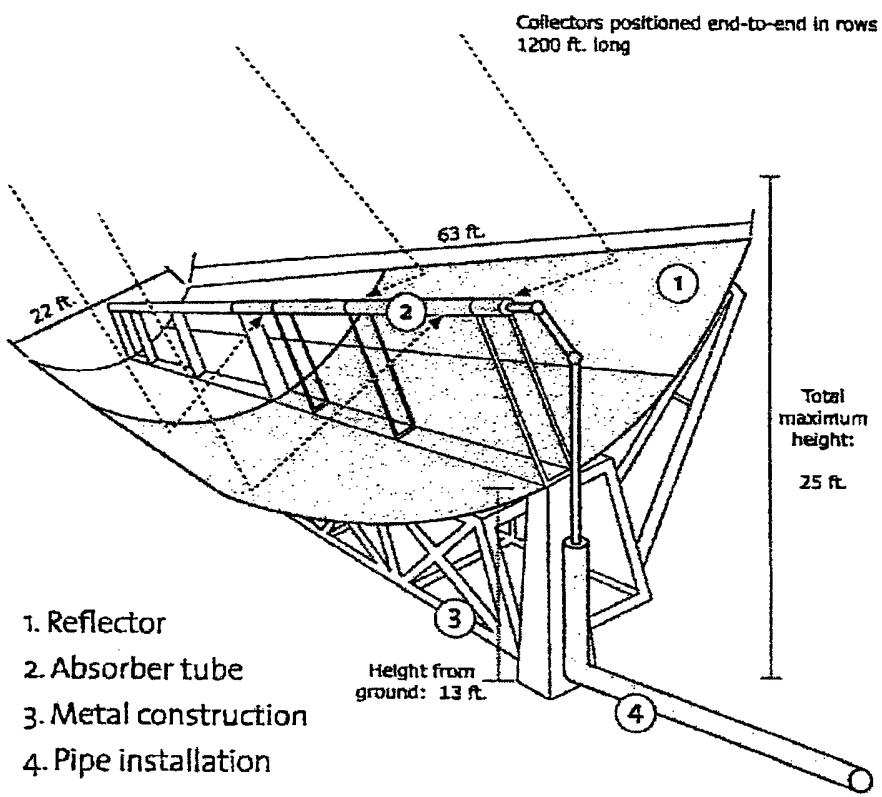
EXHIBIT B

LAND USE PLAN


SOLAR MILLENNIUM, LLC.
AMARGOSA FARM ROAD SOLAR PROJECT
FIGURE 2-3 DRY COOLING - REROUTE OPTION 1
SLATER HANIFAN GROUP
FIG. 2-3



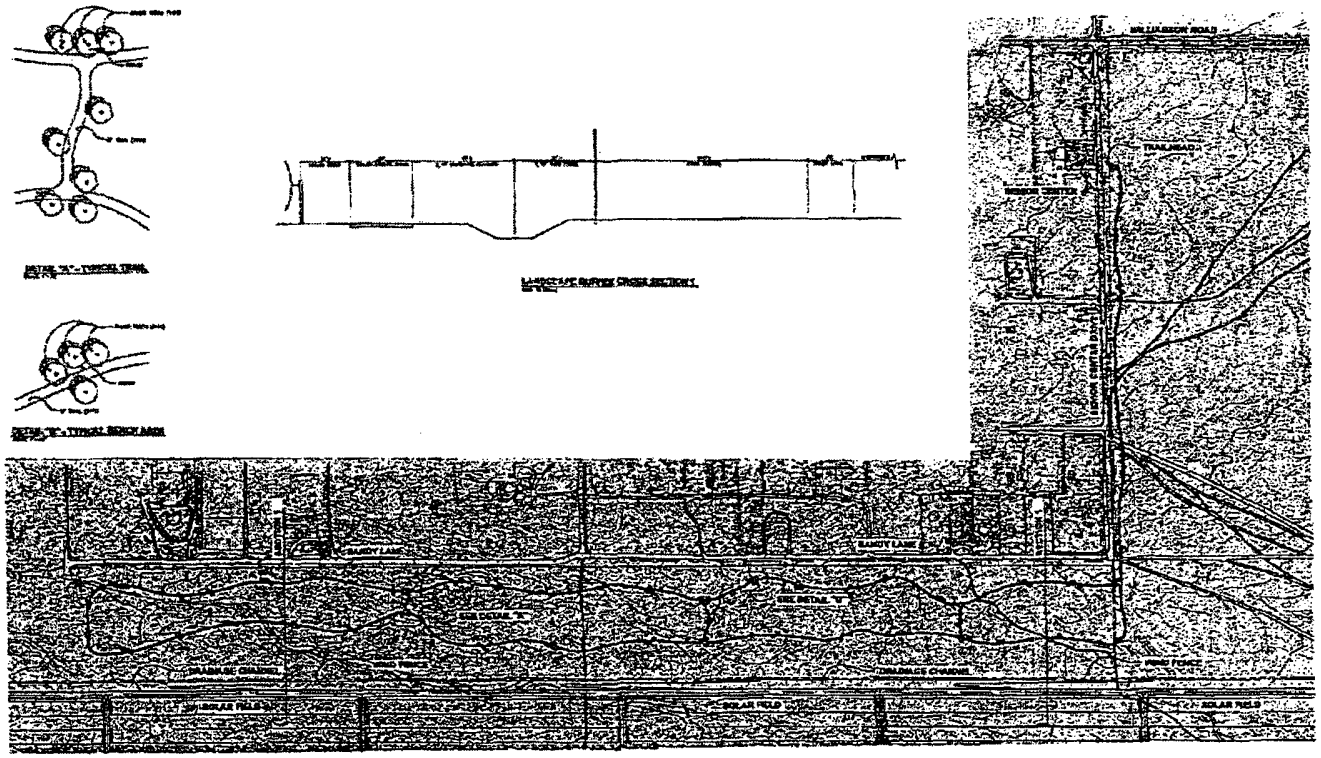

SOLAR MILENNIUM, LLC.
AMARGOSA FARM ROAD SOLAR PROJECT
FIGURE 2-6 DRY COOLING - POWER BLOCK DETAIL
SLATER
HANIFAN
GROUP
FIG. 2-6



Solar
Millennium LLC

EXHIBIT C

LANDSCAPE & BUFFER PLAN



ARMAGOSA FARM ROAD SOLAR PROJECT

NYE COUNTY, NEVADA

CONCEPTUAL LANDSCAPE BUFFER PLAN

EXHIBIT D

DESCRIPTION OF PROJECT/PERMITTED USES

Description of Project/Permitted Uses

The proposed Project includes the construction and operation of two 232-megawatt (MW) solar thermal power plants equipped with thermal energy storage and associated ancillary linear facilities. Facilities located within the Project area would occupy up to approximately 6,360 acres and would include solar fields, power blocks, an office and maintenance building(s), parking area , lay-down area, switchyard, and a storm water retention basin. Additional elements of the proposed Project would include access roads and water pipelines.

The Proponent's proposed Project would utilize parabolic trough solar thermal technology. The main element of a parabolic trough power plant is the solar field. The solar field consists of numerous parallel rows of solar collectors, arranged on a north-south axis. The solar collectors follow the path of the sun from east to west during the day to keep the sun's rays continuously focused on a receiver tube. The reflectors consist of parabolic mirrors made from transparent, silver-coated glass, which concentrate the incident solar radiation 80-fold, focusing it onto the receiver tube in the solar collector. The receiver tube contains a heat transfer fluid (HTF), which is a temperature-stable synthetic oil in a closed circuit that is heated to temperatures of up to 400 degrees Celsius. Once heated, the oil is pumped to a centrally located power block, where it flows through a heat exchanger which produces steam.

The remainder of the process is similar to the steam cycle used in conventional power plants. The steam produced by the heat exchanger is used to drive a turbine connected to an electric generator, which produces electricity that is fed to the electric grid. The steam in the turbine condenses back into the water in an air-cooled condenser. The condensed water is re-circulated through the solar HTF-steam heat exchanger.

Power Blocks

The power blocks, including the steam cycle, HTF system and thermal storage system, are located at the center of each solar field. The electrical and local control buildings, workshop buildings, electrical equipment buildings, and water treatment facilities will be located within the power blocks.

Thermal Energy Storage

Each solar power plant is capable of storing heat (referred to as thermal storage) that can be used for periods of up to 4.5 hours after sundown. The thermal storage system, consisting of three dual, two-tank molten salt systems, is sized to provide approximately 4.5 full load equivalent hours of electric generation after sundown.

Cooling Systems

The proposed Project will utilize a dry cooling system for cooling the steam cycle. The dry cooling system, which is similar to car radiator, consists of a forced draft air-cooled condenser that is approximately 154 feet in height.

Buildings within the Power Block

The electrical and local control buildings, workshop buildings, and electrical equipment buildings will be located within the power blocks. All buildings will be of pre-engineered metal frame construction and assembled on site. Other plant site buildings will include the water treatment building, as well as a number of pre-engineered enclosures for mechanical and electrical equipment. Building columns will be supported on reinforced concrete mat foundations or individual spread footings and the structures will rest on reinforced concrete slabs. The total footprint area of the buildings in each power block is approximately 31, 200 square feet.

Electrical System

The Project electrical systems consist of the steam turbine-generators, step up transformers, the electrical system within the power blocks, and the Project switchyard. The steam-turbine-generators generate electricity at 18 kV. This voltage would be increased ("stepped-up") in the switchyard to a 230kV via a generator step-up transformer. The proposed point of interconnection will be at a new switchyard to be constructed by VEA adjacent to the power plant near Amargosa Farm Road and Power Line Road. Transmission of power from the proposed Project will flow through Valley Electric Association's proposed upgraded and existing transmission lines and be delivered to the Mead Substation located near Hoover Dam.

Water Supply and Use

The Project would use dry-cooled technology. Water use in a dry-cooled plant would include water for solar collector mirror washing, makeup for the SSG feedwater, dust control, water for cooling plant auxiliary equipment, potable water and fire protection.

Hazardous Materials Management

Hazardous materials to be used during construction will include gasoline, diesel fuel, oil, lubricants, paint, and paint-related products (e.g., primer, paint thinner, other solvents). All hazardous materials used during construction and operation would be stored on site in storage tanks/vessels/containers that are specifically designed for the characteristics of the materials to be stored.

Wastewater Treatment

Sanitary wastes will be collected for treatment in septic tanks and disposed via leach fields located at the power block and the administration and warehouse areas.

Fire Protection

Fire protection systems will be provided to limit personnel injury, property loss, and downtime in the event of a fire. On-site fire protection, designed in conformance with the International Fire Code (IFC) 2006 edition with Nevada State Fire Marshal Amendments, would be provided for the Project. The system will include a fire protection water system and portable fire extinguishers.

Separate fire water storage tanks will be sited within each of the two power blocks and an additional storage tank may be required for the Assembly Hall depending upon the final location of the structure. Firewater will be sourced from the three wells to be used for the Project, and will be pumped to the site and stored in tanks for fire suppression. On-site fire pumps will be required to deliver water to the fire protection piping network for each of the buildings located within the power blocks.

The piping network will be configured in a loop so that a piping failure can be isolated with shutoff valves without interrupting water supply to other areas in the loop. Fire hydrants will be placed at intervals throughout the plant site that would be supplied with water from the supply loop. The water supply loop will also supply firewater to a sprinkler deluge system at each unit transformer, HTF expansion tank and circulating pump area and sprinkler systems at the STG and

in the administration building.

Telecommunications and Telemetry

The Project will have telecommunications service from providers who serve the Amargosa Valley area. Voice and data communications will be supported by a fiber optic system. This will be augmented with wireless telecom equipment, particularly to support communication with Project staff dispersed throughout the large Project site.

Lighting System

The Project's lighting system will provide operations and maintenance personnel with illumination in normal and emergency conditions. AC lighting will be the primary form of illumination, but DC lighting will be included for activities or emergency egress required during an outage of the plant's AC system. AC convenience outlets will also be provided for portable lamps and tools. The lighting fixtures will be hooded to minimize nighttime glare in an effort to protect views of night skies. The minimum illumination required to ensure safety and security objectives will be provided and will be oriented to minimize additional illumination in areas not pertinent to the facility.

Fencing and Security

The solar field and support facilities perimeter will be secured with a combination chain-link and wind fencing. Chain-link, metal-fabric security fencing, 8-feet tall, with 1-foot barbed wire (or razor wire) on top will be installed along the north and south sides of the facilities. Thirty-foot-tall wind fencing comprised of A-frames and wire mesh will be installed along the east and west sides of each solar field. Tortoise exclusion fencing will be included. Controlled access gates will be located at the site entrance.

Temporary Construction Workspace, Yards, Staging Areas

An assembly hall will be built for storage of equipment and for field fabrication facilities. This building may become permanent depending on the need for additional permanent warehouses for spare parts or maintenance work. Indoor storage space will be required only for weather sensitive items such as control/electrical panels, or small parts that could easily be misplaced. Some space for material requiring temperature and humidity control will be provided. Other items will be stored outdoors on raised platforms with proper covers or temporary shelters. Construction-area lighting will be provided at the warehouse locations. At the areas designated on the site laydown plan, construction subcontractors will provide their own warehousing facilities needed for their

materials.

Site Drainage and Earthwork

The site will be graded generally following the existing contours of the site in order to minimize the amount of disturbance and to allow a balanced distribution of material. Flood protection of the property from off-site flows will be provided by means of a continuous concrete lined channel around the northern and western perimeter of the site. The channel will be designed to effectively intercept the 100-year storm event off-site runoff and convey the concentrated flow to the southwest corner of the property. The channel will discharge within the property limits and energy dissipation facilities will be provided in order to disperse the concentrated flow back to a shallow sheet flow condition prior to leaving the property boundary.

Additionally, a concrete lined channel is proposed along the eastern side of the solar field in order to intercept and collect flows impacting the site from the east. Similar to the Fortymile Wash channel, the concentrated flow will be released on the property in its historic location and an energy dissipation facility will be provided in order to return the flow to a shallow sheet flow condition prior to leaving the property. Perimeter channels are recommended to be concrete lined due to the high velocity potential and for maintenance reasons. Offsite flows will be intercepted and conveyed around the site to ensure no direct contact with on-site stormwater runoff.

Four primary channels, running north to south, will be provided within the Project site. Each of the 4 primary channels will be designed to intercept and convey the 100-year storm event design flow from each contributing section. The stormwater runoff generated between the primary channels will be collected in a series of swales and small channels that will direct the flow to the appropriate channel. All minor channels within each section will be designed to intercept and convey the 25-year storm event to the primary channels.

In addition to conveyance facilities, an on-site retention basin may be necessary in order to limit post-development flows to pre-development limits. Onsite storm flows will pass through the retention basin prior to off-site discharge, providing a facility for suspended particles to settle.

The power block areas that are centrally located within the solar units will have their own water retention basins within the block. The power blocks will generally drain by sheet flow or swales to the basins. The basins will be designed to mitigate the 25-year storm flow and to provide water quality mitigation. Oil and chemical storage areas within the power blocks will have their own containment features. The basins will also be designed to retain for a short duration prior to

outfall to the nearest primary channel.

Construction

Construction will be managed by Solar Millennium. Several dozen major and minor subcontractors will be hired to undertake the myriad of mechanical, civil and electrical construction tasks. Prior to mobilization for construction, a detailed construction plan will be developed to define the construction supervisory and technical field organizations and staffing levels required for the Project. The Project is anticipated to begin construction in the fourth quarter of 2010 and the expected start of commercial operations unit #1 is mid 2013 and unit #2 is mid 2014.

Project construction is expected to occur over a total of 39 months. Project construction will require an average of 630 employees over the entire 39-month construction period, with manpower requirements peaking at approximately 1,300 workers in Month 17 of construction.

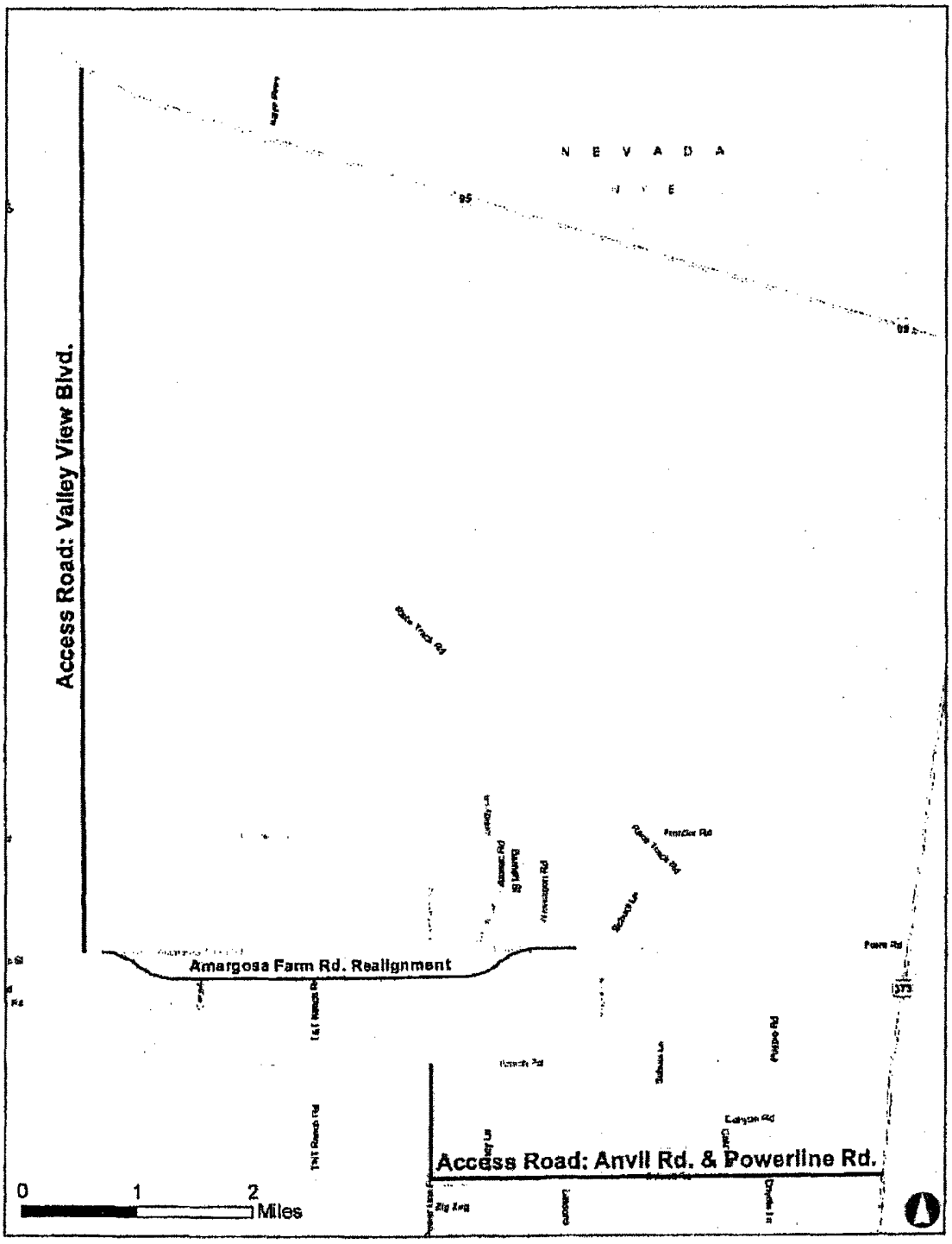
Operations and Maintenance

While electrical power is to be generated only during daylight hours, the Project will be staffed 24 hours a day, 7 days per week. A total estimated workforce of 100 full-time employees will be needed to staff the first phase of the Project (Unit #1). When the second of the 2 units comes online, the full-time staff will increase to an estimated 180. The operations workforce would consist of plant operators and maintenance technicians working 12-hour shifts, and administrative personnel working 8-hour shifts per day.

Maintenance activities during operations will include daily inspection of field components, condition assessment of critical equipment, and routine lubrication of equipment. Some specialized maintenance would be performed by the equipment provider or other specialist contractors. Long-term maintenance would be performed against a defined service and replacement schedule.

EXHIBIT E

MAP SHOWING ACCESS ROUTES


N E V A D A
Access Road: Valley View Blvd.
Amargosa Farm Rd. Realignment
Access Road: Anvil Rd. & Powerline Rd.
0
1
2
Miles

APPENDIX G – DRAFT EIS COMMENTS AND BLM RESPONSES

The 45-day comment period for public review of the Draft EIS began with the publication of the Notice of Availability in the Federal Register on Friday March 19, 2010. The BLM distributed press releases announcing the dates, locations, and times of the public meetings to local and regional print and broadcast media. The Draft EIS was posted on the BLM Southern Nevada District Office website at: http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/proposed_solar_millenium.html, and distributed to agencies and individual who have requested copies.

Four public meetings were held during the public comment period (from March 19, 2010 – May 3, 2010) to receive comments on the Draft EIS. Dates and locations of these meetings, and the number of attendees are as follows:

Beatty, NV – 10 attendees
Date: April 6, 2010
Time: 6pm – 8pm
Location: Beatty Community Center Hall, 100 S. A Avenue, Beatty

Amargosa Valley, NV – 63 attendees
Date: April 7, 2010
Time: 6pm – 8pm
Location: Amargosa Valley Community Center, 821 E. Amargosa Farm Road, Amargosa Valley

Pahrump, NV – 24 attendees
Date: April 13, 2010
Time: 6pm – 8pm
Location: Pahrump Library, 701 East Street, Pahrump

Las Vegas, NV – 19 attendees
Date: April 14, 2010
Time: 6pm – 8pm
Location: Centennial Hills YMCA, 6601 North Buffalo Drive, Las Vegas

During the 45-day comment period, the BLM received 37 comment documents (e.g., letters, emails, faxes, etc.) from individuals, private companies, interest groups, and federal and state agencies commenting on the Draft EIS. A list of comment documents received, the content of each letter, and BLM's responses to comments are provided below. Each comment letter was assigned a reference number and each comment was identified with a number. Where appropriate, changes and additions are reflected in the Final EIS to respond to comments.

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Comment Document 1
Public Hearing on the Amargosa Farm Road Solar Power Project Transcript
Beatty, NV 4.6.2010

18 JOHN BOSTA: My name is John Bosta,
19 B-o-s-t-a. I live in Amargosa Valley. I have a
20 question about the groundwater model. You say that
21 you're looking at 435 acre feet of water and using
Comment No. 01-01-01 22 the groundwater flow. Is that groundwater flow on
23 one well or is it on the cumulative effect of the
24 three wells planned?
Comment No. 0 1-01-02 25 And then my second question is does each

Responses to these comments are provided on a separate page following this comment document.

Comment No. 01-01-02

plant require 435 acre feet of water or is that a total for both of the plants being developed?

SANDRA FAIRCHILD: Do we want to respond to these comments? I mean, I can answer those comments --

GREG HELSETH: Go ahead.

SANDRA FAIRCHILD: -- because they're in the Draft EIS, or does someone on the table, front table, like to respond?

JASON HIGGINS: Go ahead.

SANDRA FAIRCHILD: Well, the Draft EIS considered pumping the requested amount for three wells. Subsequent to the release of the Draft EIS, it was determined that one well would be used for the project. The 400 acre feet that they're proposing to use for this project will be for the entire plant, for two facilities, two power blocks.

Comment No. 01-01-03

JOHN BOSIA: Which one of the three wells will be used?

SANDRA FAIRCHILD: I don't know off the top of my head. I think it was the -- there's three wells considered. I think there was a well in the center portion. I think up here on the -- I believe, Jason, correct me if I'm wrong, is this the new well, the one that's right in the middle?

Responses to these comments are provided on a separate page following this comment document.

JASON HIGGINS: The center.

SANDRA FAIRCHILD: The center well is one that they're considering moving forward for use for this project.

Comment No. 01-01-04

JOHN BOSTA: Now, is that on Funeral Mountain Ranch or is that on the Dewitt property? My question is is this well located on the Funeral Mountain Ranch or is that well located on the Dewitt property? And if it is located, how is the water going to be transported through pipes to the project?

Comment No. 01-01-05

SANDRA FAIRCHILD: I don't know the answer to which well that is actually located, but there's two alternatives that are considered for moving the water from that location to the project site. They'll either move the point of diversion through the Nevada Department of Water Resources to the state engineer's process, change the point of diversion to another location on the project site, or they will be constructing a pipe to convey that water from that site to the project area. And I don't think at this point in time that decision has been made. Does that answer your question?

JOHN BOSTA: Yes. Thank you.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 01-02-01

LARENE YOUNGHANS: LaRene Younghans is I-a capital R-e-n-e, Y-o-u-n-g-h-a-n-s. My comment is I just want the BLM to approve the dry process so It will use the least amount of water.

SANDRA FAIRCHILD: Thank you.

JASON HIGGINS: That is the BLM's preferred alternative.

A response to this comment is provided on a separate page following this comment document.

13 EDWARD GERING: Last name is Gering,
14 G-e-r-i-n-g. And I represent the International
15 Brotherhood of Electrical Workers, Local Union 357 in
16 Las Vegas, Nevada. We have approximately 3300
17 members who reside in the communities of Las Vegas,
18 Pahrump, Amargosa, Beatty and surrounding
19 communities.
20 We are wholeheartedly behind this project
21 and projects like this, as we feel that they will
22 provide our members with good opportunities for
23 employment at good wages and will also put Nevada in
24 a favorable position hopefully to lead the nation in
25 the production of renewable energy.

Comment No. 01-03-01

A response to this comment is provided on a separate page following this comment document.

1 So we'd like to see that all the issues of
2 the communities that will be affected are addressed
3 in a positive manner, and we would be wholeheartedly
4 a hundred percent behind this type of project and
5 other projects like it. Thank you.

8 KEVIN EMMERICH: It's Kevin Emmerich,

Comment No. 01-04-01

9 E-m-m-e-r-i-c-h. The first question or comment I
10 have is you got the preferred alternative, which is
11 dry-cooled, then you've got the required no action
12 alternative, then your only other offered alternative
13 as wet-cooled, which is pretty unrealistic. I mean,
14 what is that, 4,000 acre feet? You know you don't
15 have that in Amargosa Valley, so I'd like to request
16 have another more reasonable alternative that's off
17 the site because you don't really provide that in
18 your EIS.

Comment No. 01-04-02

19 And then the other comments or questions I
20 have it says in the EIS you're going to have a
21 detention basin for flooding somewhere. And one of
22 the options is to have it somewhere I guess to the
23 north, which is also off the site. And I'm not sure
24 if I'm interpreting that right but it seems to have
25 that indication.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 01-04-03

1 And then on the map here in the EIS it says
2 there's an option of making a new road, Highway 95,
3 which I guess would be a new access road. And is
4 there going to be an environmental assessment for
5 that? Will that happen before you approve the
6 project? Those are some of the details I'm curious
7 about.

AMENDED APPLICATION CONTINUED

VOLUME 3 OF 3

Comment No. 01-05-01

15 LARENE YOUNGHANS: I just have a question.
16 How many people will this employ after the
17 construction?
18 SANDRA FAIRCHILD: According to the analysis
19 that we've conducted in the Draft EIS, the
20 construction, the peak construction force for during
21 construction will be around 1300 folks, and then
22 after the project is constructed they are
23 anticipating to employ up to 180 full-time employees.
24 LARENE YOUNGHANS: Thank you.

A response to this comment is provided on a separate page following this comment document.

RESPONSES TO COMMENT NO. 01-01-01 THROUGH 01-05-01

Response to Comment No. 01-01-01

Solar Millennium has filed an application (No. 79699) with the Nevada Division of Water Resources Nevada State Engineers Office to change the place and manner of use of Certificate 5717. The water right has an annual duty of 603 afy which has been pumped approximately 413.88 afy on average over the last 25 years. Solar Millennium intends to drill a new well and move 400 afy from its current point of diversion (POD) located in the NE 1/4 of the NE 1/4 of Section 23, Township 16 South, Range 48 East, to a new well (POD) to be located approximately 300 feet east of the original POD. This will allow for redundancy should one of the wells fail. Meters will be placed on both wells to ensure there is no exceedance of the permissible annual duty.

Response to Comment No. 01-01-02

The operational water requirement for two 232 MW (gross 250 MW) dry-cooled solar power plants is 400 afy.

Response to Comment No. 01-01-03

Permit 15893, Certificate 5717 located in the NW 1/4 of the NE 1/4 of Section 23, Township 16 South, Range 48.

Response to Comment No. 01-01-04

The certificated water right is held by Geneerco. The water right has a priority date of 12-13-54.

Response to Comment No. 01-01-05

As stated in Section 2.3.5.1, a new pipeline will be constructed from the point of diversion to the project site.

Response to Comment No. 01-02-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process. The BLM preferred alternative is the Proposed Action (dry-cooled alternative).

Response to Comment No. 01-03-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 01-04-01

A wet-cooled solar facility is a viable alternative; however, the level of effort to acquire the amount of water needed for a wet-cooled solar project and the potential legal action from concerned stakeholders increases time and costs to develop a wet-cooled solar project in this region.

The FEIS studies a reasonable range of alternatives, including three fully-developed alternatives and many that were evaluated but not brought forward for detailed evaluation because they failed to meet Applicant's objectives. The BLM concurred. These dismissed alternatives included alternative sites.

Response to Comment No. 01-04-02

Detention basins will be constructed within the project footprint. There are no plans to construct a regional flood control facility north of the project site.

Response to Comment No. 01-04-03

No new road will be constructed off of Highway 95. Solar Millennium will work with Nye County to upgrade an existing road off of Valley View Blvd to the project site. This upgrade will be subject to additional permits and approvals from various agencies (e.g. BLM, NDEP, and Nye County). Any modifications to roadways or lands managed by the BLM will be subject to compliance with Title V of the Federal Land Policy Management Act, BLM right-of-way regulations, and other federal laws, including the National Environmental Policy Act.

Response to Comment No. 01-05-01

The Project is expected to employ between 170 to 200 full-time employees during the Project's 30-year operational life.

Comment Document 2
Public Hearing on the Amargosa Farm Road Solar Power Project
Transcript
Amargosa NV, 4.7.2010

Comment No. 02-01-01

20 MATT LYDON: Yes, I'm Matt Lydon, that's
21 M-a-t-t, last name is spelled L-y-d-o-n. I'm a
22 business representative for Plumbers and Pipe Fitters
23 Local 525 here to speak on behalf of this project. I
24 feel that Solar Millennium has mitigated the changes
25 to accommodate the area, and also speaking on behalf

Responses to these comments are provided on a separate page following this comment document.

1 of 2600 members, of those 2600 members, 1300 are
2 unemployed. This will create a great situation for
3 them to get reemployed. Thank you.

Comment No. 02-02-01

PAT MINSHALL: Pat Minshall, M-i-n-s-h-a-l-l. Well, I think most of us would like to see a solar plant here in Amargosa Valley. We do not want to see it on main street in the middle of our town. I've done quite a bit of research and have not been able to find a single solitary solar plant in the world, and there might be, in the middle of a town. I think there are a lot of alternatives and I think we should be looking at an alternative placement.

Responses to these comments are provided on a separate page following this comment document.

14 JOHN CHRISTIANSEN: John Christiansen
15 spelled C-h-r-i-s-t-i-a-n-s-e-n. Does that count as
16 part of my three minutes? I am a citizen of North
17 Las Vegas and I'm also business manager of Sheet
18 Metalworkers Local 88 in Las Vegas and represent 2200
19 members and their families there.

Comment No. 02-03-01

20 This project is important to me and I'm in
21 support of this project for a couple of reasons, most
22 importantly this project helps eliminate the carbon
23 footprint that we're all aware of. Reading in the
24 paper the rain in the northeast, studies are proving
25 that this is a direct result of global warming. This

Responses to these comments are provided on a separate page following this comment document.

Comment No. 02-03-01 (continued)

is the sort of power projects that we need for our country and for our generations.

I brought my son, Garret. Stand up, Garret. He's 13 years old going into high school next year and a good looking kid. And for him and a country that I want him to enjoy the types of things that being a native Nevadan, and both of us are, have enjoyed. The wildlife, the fishing, the hunting and that, I want that stuff left for him and for his kids and my grandkids. This project is the type of project where we need to start turning for the energy source. This part of the country is a great area to have this.

Also, and if you'll bear with me just a minute, the jobs are important, but more importantly these jobs that are created enhance existing careers and create careers where people can have benefits, health benefits, pension plans. People can work at these plants and retire with dignity and take care of their family and make sure that they have the health care and the benefits that they need. These are good jobs that enhance existing careers and create careers where people can work with dignity and retire with dignity. And those are a couple of reasons I'm in support of this project. Thank you.

Comment No. 02-04-01

CORDELL SANDERS: Cordell Sanders, C-o-r-d-e-l-l, S-a-n-d-e-r-s. I'm a representative of the Sheet Metalworkers Local 88. I'm out of North Las Vegas. I'm here to support this project because this green energy is something that we've needed in this valley for a long time, not just Amargosa Valley but the Las Vegas Valley, because it's a dry climate. It has sunshine 90 percent of the time.

We should be utilizing this energy. It's going to provide jobs for the future. And I'm a member of Local 88. And like John said, we have members that are unemployed and it will provide jobs in the future. Thank you.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 02-05-01

14 ROLAND RAJM: My name is Roland Rajm,
15 R-a-j-m, and I'm a resident of Amargosa and I am
16 against this project. And the reason that I'm
17 against the project is because, like the lady said,
18 it is the only solar plant that I've been able to
19 find on the internet that's sitting on top of a town.
20 The closest one that there is two miles away.
21 This is the EIS that I downloaded from the
22 internet. I couldn't finish it all, just barely
23 half. I tried to read it, didn't have time. Now
24 it's commendable that North Las Vegas and everybody
25 else wants the jobs: 13, 1500 of them. I believe

Comment No. 02-05-02

Responses to these comments are provided on a separate page following this comment document.

1 that not even ten of them will come from this town.
2 All of the benefits are for everybody else
3 except us. We get nothing from this. We stand only
4 to lose. When the three years are up, when the
5 construction is down, this town is not going to be
6 Amargosa, it's going to be Solar Millennium because
7 there won't be anything else. Thank you.

Comment No. 02-06-01

JOHN BOSTA: My name is John Bosta, B-o-s-t-a. A first comment that I have on the EIS is related to the alternatives. If I'm correct, alternative A is wet cooling, alternative B is -- excuse me, A is dry, B is wet, and then there's the other alternative, which is take no action.

At last night's meeting it was pointed out that the wet cooling is no action so, therefore, that leaves only one alternative and, therefore, the EIS does not present an alternative to this project.

Comment No. 02-06-02

The other thing that bothers me is that we worked three years on an area plan, and our area plan for land use has no solar project south of Farm Road, and probably one-third of this project is south of Farm Road. In fact, it even anticipates moving Farm Road. The land south of Farm Road in the EIS shows no plan for how that land is going to be used.

Comment No. 02-06-03

The scoping meetings that we had, much of

Responses to these comments are provided on a separate page following this comment document.

Comment No. 02-06-03 (continued)

1 the information has not been included in the EIS. In
2 the buffer they show fences and trees to buffer the
3 wind, and I cannot imagine how you can construct a
4 fence high enough to hide the project, other than the
5 cooling towers, that can stand the force of the wind
6 here in the valley.
7 If they plant trees, then water will be
8 needed to grow the trees, and I imagine that must be
9 in the area of 35 to 65 gallons of water a day, and
10 we don't have that kind of water here in our valley.

Comment No. 02-06-04

11 The next part is that the people that live
12 on Sandy Lane, their visual view of the valley
13 looking back towards the northwest is going to be
14 totally obliterated.
15 The other part that has been brought up is

Comment No. 02-06-05

16 that I don't think that the EIS has adequately
17 covered the dangers of explosions and fires to the
18 population, especially those people living on Sandy
19 Lane. Thank you.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 02-07-01

20 JAN CAMERON: Jan Cameron, C-a-m-e-r-o-n. I
21 too live in this valley, as opposed to all of the
22 folks that were kind enough to come out from Las
23 Vegas. I am slightly more optimistic than some
24 people here. I am assuming that more jobs than five
25 will come to this valley. I'm actually hoping that a

Responses to these comments are provided on a separate page following this comment document.

Comment No. 02-07-01 (continued)

1 large percentage of the jobs of this plant will grow
2 out of this valley, as they should, because it is
3 Amargosa Valley, A-m-a-r-gosa Valley, not Las Vegas,
4 not North Las Vegas. This is our valley, we live
5 here.

Comment No. 02-07-02

6 Second of all, I too would have been, as I
7 think all of you know who are in this room, much
8 happier with a different location for that plant.
9 I'm not thrilled with the idea of it being on Farm
10 Road. I'm certainly not thrilled with the idea of it
11 being as far east as it is, as close to Sandy Lane as
12 it is.
13 On behalf of the vast majority of the people
14 in this valley, I want you to know what I said from
15 the very beginning, we do not want Farm Road moved,
16 period. Farm Road is our only east-west thoroughfare
17 that goes from one side of the valley to the other
18 and there are things that can be put on the south
19 side of it that do not have to be encompassed in a
20 fence and, therefore, require the block, the movement
21 of Farm Road. We do not want Farm Road moved.

Comment No. 02-07-03

22 A minor point, the Beatty Fire Department is
23 also in very close coordination with this fire
24 department. They actually have been the most closely
25 cooperating agency throughout the existence of the

Responses to these comments are provided on a separate page following this comment document.

Comment No. 02-07-03 (continued)

Comment No. 02-07-04

Comment No. 02-07-05

two fire departments. They were omitted from this plan in your mitigation discussions.

I am concerned that the site that is shown in the EIS is the original site, which encompassed this building as well as our park across the street and our school next door and all of these other buildings. I was expecting by this point in time that it would have shown a scaled back footprint rather than the original request, which was including all of this land. And it bothers me that the original request is still being shown in the EIS.

I too am concerned about the Sandy Lane folks who built their homes there. I know some of the people on Sandy Lane are perfectly happy. I know that others are not. And the main reason is they built their homes wanting to look at the vista that they had and they're not seeing that vista with this plant sitting there on the western side of them. There may be only six houses that are concerned about it, but there are people. We live here.

I do appreciate the efforts that are being made to try to mitigate the vision of the plant itself but I again hope that you will address the issue of Farm Road and work with those folks to try to make what goes in there better than what they feel

Responses to these comments are provided on a separate page following this comment document.

is looking at right now. Thank you.

Comment No. 02-08-01

JOHN EGAN: Hi, I'm John Egan, J-o-h-n, E-g-a-n, with NextLight Renewable Power, another power company that does just solar. We're here in support of the project tonight. I think the main reason is we at NextLight believe all solar is good. Anything we can do to reduce our carbon impact on this world is a good thing. We need to do this. Thank you.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 02-09-01

10 HOWARD BLUMENFELD: Howard, H-o-w-a-r-d,
11 Blumenfeld, B-l-u-m-e-n-f-e-l-d. A bunch of
12 questions. How much are you going to save us in
13 electricity? That's one question. Number two, you
14 say over the project's 30-year life, does that mean
15 it's done in 30 years? Okay, that doesn't tell us
16 anything there.

Comment No. 02-09-02

17 As far as to build it, you've got the
18 military reservation. That's government land. What
19 are you even doing here? That's a good question. I
20 think those things ought to be answered. I can't
21 blame the people. I live in this valley here too,
22 but, I mean, what do you say to this?

Comment No. 02-09-03

23 And then, question, what is solar compared
24 to nuclear? They've not laid down costs. You're not
25 telling us anything there. I'm for clean air but we

Comment No. 02-09-04

Responses to these comments are provided on a separate page following this comment document.

1 recycle, but these are things you're not telling us a
2 thing about. I think that should be considered. I
3 mean, how many miles do you have to go? You're on
4 the military reservation. You don't even have to
5 come to us. And that's BLM, or government land.

Comment No. 02-09-05

6 So I understand other people are upset, but,
7 you know, what is it going to do? You got water.
8 You got water, you know, wet and dry. At Boulder
9 City you're right on Lake Mead. Somebody said oh,
10 the land isn't flat. They can't adjust panels and
11 make them the same? You have what, six acres over
12 there? You can do a lot over there too. So I don't
13 know what the purpose is.

Comment No. 02-09-06

14 And also who is going to audit what happens
15 to the water? Something we drink, you follow?
16 You're not saying anything there. You use water to
17 what, to cool down the turbines? What happens to
18 that water? Is it recycled? Is it going to go into
19 the ground and pollute the water supply? You're not
20 answering that either. I think that is a big
21 concern.

Comment No. 02-09-07

22 So as far as dollars and cents, you know,
23 let's talk about it. Are you going to cut our
24 electric bills in half? I mean, putting people back
25 to work, that's not a discussion about that. That's

Responses to these comments are provided on a separate page following this comment document.

1 it, questions, not comments.

GENNE NELSON: It's Genne Nelson, G-e-n-n-e, N-e-l-s-o-n. I live in Amargosa. There's a lot of issues. I'm just going to touch on two of them. The first is air quality and primarily talking about dust. There's a lot of information about the emissions that come from the equipment and so on and so forth.

Comment No. 02-10-01

The main concern out here is the dust itself. And they say that they want to control the dust because of the mirrors but we've seen what men can do out here. So I think at the very least that these nice models are just as good as the information that goes into them, that there should be some accountability and some air quality monitoring for particulate that is provided to make sure that they are meeting the standards that they say that they can meet.

And it's easy to say that. And I know we've had problems in the past with NDOT that, you know, well, we say we have problems but we have no way to prove it. And if you institute monitoring, then we have a way to prove that we are or are not having problems with that.

GREG HELSETH: On the monitoring question,

Responses to these comments are provided on a separate page following this comment document.

I'll go ahead and answer that. There will be a monitor assigned to the project once a -- if a favorable Record of Decision is reached, there will be a further -- during construction a CIC. It's a monitor that the applicants will hire and they will report to the BLM that will constantly monitor dust, air quality, whether or not the fencing is going up correctly, whether they're doing things according to the plan of development and report back to us. And we could stop the project for any violation.

So there will be a full-on monitor during the course of the construction. And then the BLM will, during the lifetime of the project, will continue to monitor the project frequently, so just to answer the question.

Comment No. 02-10-02

GENNE NELSON: Okay. And I can agree with that but after construction there also needs to be regular monitoring collected and not just at random but that there be instruments in place.

Comment No. 02-10-03

And the other would be the factor of noise. They are basing it on a standard of 55 decibels, and they say that's what the EPA does. I don't think that's quite fair because I think you have to look at what is the ambient situation out here already.

Rural residential is not necessarily the

Responses to these comments are provided on a separate page following this comment document.

Comment No. 02-10-03 (continued)

same as residential in town. And I think you may need to modify that 55 limit to looking at what is the loss for the people, what they have right now versus what they will have if they go to a 55 decibel limit.

A lot of the people out here have swamp coolers. Their windows are open half the year. And especially at night, noise is very disruptive. So I really think these things need to be looked at in a little more detail than the modeling. Thank you.

Comment No. 02-11-01

EUNICE HERNANDEZ: My name is Eunice Hernandez, E-u-n-i-c-e, H-e-r-n-a-n-d-e-z. I live right on the view and I'm probably one of the present to hear that noise and to have to worry about all that, but I'll be fine because the jobs that is bringing for us is going to be good, because my dad, he hasn't worked for two years, and he's supporting a family of six. And that money is money that we need.

And you guys are complaining about the noise and about how it will look, and I'm worried about how my family will survive the year. So I don't think that's fair. Thank you.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 02-12-01

STEPHEN BURNAGE: Stephen with a P-H, B-u-r-n-a-g-e. I represent a company called RetCo that has filed a 299 application to build a transmission line from south of Las Vegas into this area.

I want to speak on behalf of the project but also give assurance to everybody that the Amargosa Valley is a very special place. I know it's a very special place for everybody who lives here. If the world is going to reduce its carbon footprint, development in Amargosa Valley is the perfect place for it to take place.

I think it's the job of all of us developers to engage everybody -- local community, the unions, the other generation companies, investors -- to make sure that it's a win-win for everybody.

So I want to speak on behalf of the project but also just assure everybody that for the developments that follow this excellent development, that we'll do our best to work with everybody. And anybody is free to sort of contact me to sort of ask a little bit further about what may be following. But I think they're probably about a year away from actually having to stand up in front of you and hold a similar session. Thank you.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 02-13-01

CURTIS STENGEL: Curtis Stengel, C-u-r-t-i-s, S-t-e-n-g-e-l. I had listened to these neighbors tell their thoughts and I had just a couple of questions in regards to the offset of Farm Road, should it take place. Will there be an offset with the same power line that goes down that right-of-way? Because that's where my power comes from, and I'd be real upset if I didn't have power.

Comment No. 02-13-02

The other thing is there's a buried fiberoptic T1 line, and I don't know if that's been addressed, but that's on the same right-of-way and it would have to be relocated or discontinued. And I hope that you would address that. Thank you.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 02-14-01

16 CHRIS WILE: Chris Wile, C-h-r-i-s, W-i-l-e.
17 I represent -- I'm a business rep for International
18 Brotherhood of Electrical Workers 357 in Las Vegas.
19 We have -- the west here has a tremendous amount of
20 natural resources with having the sun, the sun rays
21 that we have here. With this plant there's more
22 maintenance than there is with most PV -- in most
23 photovoltaic applications, so there is more
24 continuous jobs when the plant is built, after the
25 plant is built.

Responses to these comments are provided on a separate page following this comment document.

1 I'd also like to welcome everybody to come
2 down to our apprenticeship. We have a wind generator
3 as well as some photovoltaic stuff at our
4 apprenticeship as well as our union hall. So not
5 only do we talk about this stuff, but we actually do
6 this stuff. And this is one of the most efficient
7 ways of using the sun's rays, and I'm also in support
8 of this project.

Comment No. 02-15-01

11 BILL WAHL: Good afternoon. I'm Bill Wahl,
12 W-a-h-l. I'd like to address the union members. I'd
13 certainly like to have some apprenticeship programs
14 up here in Amargosa Valley. I'd like to have your
15 business cards. We'll be glad to get in touch with
16 you. Thank you.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 02-16-01

19 J.W. CUNNINGHAM: I'm J.W. Cunningham,
20 C-u-n-n-i-n-g-h-a-m. I am almost past the age of
21 working, but I like the idea of these solar companies
22 coming in because it offers opportunities for our
23 young people not to have to leave the valley, like
24 this little young lady over here was talking about
25 her father hasn't worked in two years.

Responses to these comments are provided on a separate page following this comment document.

1 The other thing that actually concerns me is
2 the unions, are they going to bring in all people
3 from out of town or is it going to be an opportunity
4 for the people here in the valley to be employed?
5 I think solar energy is a thing that is
6 coming. Nobody is going to fight it, it's going to
7 be here, whether it be on our main street downtown,
8 and I don't see no downtown here yet, but they're
9 coming and coming fast, folks. But let's look at it
10 through a little more open mind for our young people
11 and that way they don't have to go to Vegas and God
12 only knows where else to get a job. Thank you.

Comment No. 02-17-01

15 LINDA BROMELL: Linda Bromell,
16 B-r-o-m-e-l-l. Most of the people I talk to out here
17 I don't think hardly anyone has an objection to this
18 plant being out here. The problem is Amargosa Farm
19 Road is Amargosa Farm Road. This road should not be
20 moved. It is our main road. I know right now we're
21 a tiny town but this is where all of our schools and
22 everything is. This road should absolutely not be
23 moved.
24 BLM had told me last year sometime that they
25 were looking into getting people to release the land

Responses to these comments are provided on a separate page following this comment document.

1 farther out towards 95 where this could be pushed
2 back a little because it had been tied up for years
3 and these people either needed to do something or get
4 off the brick. So if it could be moved back, Farm
5 Road should absolutely not be moved. It is not
6 conducive to this town. Thank you.

Comment No. 02-18-01

7 BILL VERBECK: Last name Verbeck,
8 V-e-r-b-e-c-k, first name is Bill. I'm with Great
9 Basin College, and I also represent the Economic
10 Development Authority for Nye County. And I join
11 with the residents here and it truly is, if this
12 project goes forward, it is about our economy and
13 jobs.
14 And I look forward to working with not only
15 our labor unions that are present here tonight but as
16 the gentleman said before me, let's look at our
17 locals in this part of the valley and certainly in
18 Pahrump too.
19 You may be aware we are leading the nation
20 in unemployment. Twenty percent is a more accurate
21 figure than the 15.2 percent you're hearing. Our
22 underemployed is another 20 to 30 percent. We have
23 people here, as the young lady said, and we're here
24 as a college and as a community to do everything we
25 can in this county to get as many of our locals

Responses to these comments are provided on a separate page following this comment document.

1 employed as we possibly can.

Comment No. 02-18-01 (continued)

We provide two training programs in solar voltaic, whatever it takes, construction, OSHA 10. Those two are online. I truly do, however, hope that we can move forward with some kind of a partnership. Essentially we are merging, if you will, union apprentices and journeymen with our locals in some form of a chapter so we can get our folks employed. Thank you.

Comment No. 02-19-01

14 BILL BARRACKMAN: Bill Barrackman,
15 B-a-r-r-a-c-k-m-a-n. My concern is this is not being
16 done by an American company. And we hear the phrase
17 quite often to free ourselves from -- make ourselves
18 independent from foreign control sources of energy.
19 As I understand, this is a German company.
20 And when you look at what they did in southern Spain,
21 the power rates are about three times what it is from
22 fossil source fuels energy in southern Spain, and as
23 a result of that what happened is businesses moved
24 out of southern Spain and went to other areas where
25 they could get power for a third cheaper.

Responses to these comments are provided on a separate page following this comment document.

1 I feel like that, you know, the profit
2 motive here for this German company is huge, and I
3 feel like an American company or even something
4 sponsored by the federal government, we have a corp.
5 of engineers that could come in here and build this
6 at cost and provide a much lower cost of electricity
7 for the people.
8 And if Amargosa Valley could assure people a
9 flat rate on their energy costs out over the next
10 several years, that would be one of the greatest
11 stimuli that we can have to bring people into this
12 valley to settle here and also build their businesses
13 here.

Comment No. 02-20-01

REXINE REEVES: R-e-x-i-n-e, R-e-e-v-e-s. I live on North Sandy Lane. And I'm very near -- I saw the pictures of how those cellulars are going to be so close to our home. It was to be farther but it's not, it's closer.

And I have spoken before and I'm just saying now, I'm too nervous to speak in public right now at the moment. And I'm not liking it. I don't see why BLM can -- why BLM can't free some of that land farther away and move towards 95.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 02-21-01

24 BILL DEWITT: Bill Dewitt, D-e-w-i-t-t. And
25 I own property along Farm Road. And Farm Road in its

Responses to these comments are provided on a separate page following this comment document.

1 present condition is a disaster. It's not well
2 maintained. It floods when there's a lot of rain,
3 and if it is relocated and if they did a proper job,
4 it should be smooth and to a point where the water
5 would go underneath Farm Road and not block it when
6 there's a lot of rain.
7 So I would be in favor of the relocation of
8 Farm Road, assuming it is done according to Nevada
9 state standards for roads of that size, not just the
10 way it is now. Thank you very much.

RESPONSES TO COMMENTS 02-01-01 THROUGH 02-21-01

Response to Comment No. 02-01-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 02-02-01

Alternatives analyzed in this EIS are described in Chapter 2 (Proposed Action and Alternatives). Alternatives eliminated from further analysis, and the reasons for their dismissal from further analysis are described in section 2.2.1. Solar Millennium has applied for a right-of-way for the particular parcel at issue, for various reasons. Relatively few sites meet the necessary criteria established by the Proponent. In any event, BLM's action is to grant, deny, or grant with modifications the requested right-of-way. If the decision is to deny or grant with modifications the right-of-way, the Proponent may decide to pursue other options, including alternative sites.

Response to Comment No. 02-03-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 02-04-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 02-05-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 02-05-02

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 02-06-01

Three alternatives were analyzed in this EIS - Solar Millennium's proposed action (dry-cooled); a wet cooled alternative which was originally proposed; and a No-Action alternative. The wet-cooled and No Action alternatives are two very different alternatives, with significantly different effects.

Response to Comment No. 02-06-02

Proposed uses of lands south of Amargosa Farm Road are shown on Figures 2-1 and 2-2.

Response to Comment No. 02-06-03

A Development Agreement has been made and entered into by and between Nye County and Solar Millennium to ensure the land use impacts on public services in connection with the proposed Project are mitigated. The goal of the Development Agreement is to "promote the health, safety, and general welfare of the County and its inhabitants, to minimize uncertainty in planning for and securing orderly development of the Property and surrounding areas, to insure attainment of the maximum efficient utilization of resources within the County in a way that provides the highest economic benefit and least fiscal cost to its citizens, and to otherwise achieve the goals and purposes for which the laws governing development agreements were enacted." A copy of the approved Development Agreement between Nye County and Solar Millennium is provided in Appendix F.

Response to Comment No. 02-06-04

See response to Comment No. 02-06-03. As part of the Development Agreement, the Proponent and Nye County have agreed that the proposed Project will contain design elements to mitigate the visual impact of the project. Accordingly, subject to modifications mutually agreeable to the County and Proponent, the proposed Project shall conform to the Landscape and Buffer Plan included in Exhibit C of the Development Agreement (see Appendix F).

Response to Comment No. 02-06-05

Though catastrophic events, such as fires, are not anticipated, the proponent will implement a stringent safety plan that identifies best management practices to reduce and mitigate fire hazard or other potential safety events. Also, as per the Development Agreement between Nye County and Solar Millennium, the Developer (Solar Millennium) will provide assistance for fire, police, and medical services. Details can be found in the Development Agreement in Appendix F.

Response to Comment No. 02-07-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 02-07-02

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 02-07-03

Beatty Fire Department has been added to the Final EIS as a potential responder for additional fire support at the site.

Response to Comment No. 02-07-04

The Proponent's initial application for a right-of-way and subsequent Plan of Development erroneously stated the area of the right-of-way to be 7,810 acres. The actual area, by legal description is 7,630 acres. On August 6, 2009, the Proponent sent a letter to the BLM requesting a reduction in the acreage from 7,630 acres to 6,320 acres. The Proponent's decision to release a portion of the lands from further consideration was based upon refinement of the Project layout following surveys conducted in the spring of 2009. The lands released from further consideration are shown on Figure ES-2 and Figure 1-2.

Response to Comment No. 02-07-05

The Proponent has committed to mitigation measures that will reduce visual impacts to the greatest extent feasible by use of: color mitigation, landscape screening, restoration of disturbed areas, and night lighting mitigation. A Development Agreement has been made and entered into by and between Nye County and Solar Millennium to ensure the land use impacts on public services in connection with the proposed Project are mitigated. The goal of the Development Agreement is to "promote the health, safety, and general welfare of the County and its inhabitants, to minimize uncertainty in planning for and securing orderly development of the Property and surrounding areas, to insure attainment of the maximum efficient utilization of resources within the County in a way that provides the highest economic benefit and least fiscal cost to its citizens, and to otherwise achieve the goals and purposes for which the laws governing development agreements were enacted." A copy of the approved Development Agreement between Nye County and Solar Millennium is provided in Appendix F.

Response to Comment No. 02-08-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 02-09-01

If approved, this Project would not directly sell electricity to ratepayers. Given the many factors that determine electricity rates, it is impossible to determine whether the proposed Project would lead to a decrease in rates. It is also outside the scope of this EIS to determine whether the Project itself would lead to a decrease in electrical power rates. This inquiry should be directed to the Public Utilities Commission of Nevada. Importantly, the Project would lead to substantial employment, increased tax revenues, and other socioeconomic benefits if approved.

Response to Comment No. 02-09-02

As stated in Section 2.3.16 (Decommissioning), the lifespan of the proposed Project is expected to span at least 30 years. At the end of the Project's useful lifespan, the facilities will either be repowered or decommissioned. When the facility is no longer viable, a facility closure and decommissioning plan will be developed which describes closure requirements and the anticipated bond level necessary to satisfy BLM requirements in 43 CFR Parts 2800 and 2900.

Response to Comment No. 02-09-03

The BLM's action for this EIS is to either grant or deny Solar Millennium's application for a right of way on lands managed by the BLM. The BLM must decide whether, and if so, under what conditions it will grant a right of way to enable construction and operation of the proposed project.

Response to Comment No. 02-09-04

The comment is unclear. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 02-09-05

The BLM's action for this EIS is to either grant or deny Solar Millennium's application for a right of way on lands managed by the BLM. The BLM must decide whether, and if so, under what conditions it will grant a right of way to enable construction and operation of the proposed project.

Response to Comment No. 02-09-06

It is the responsibility of the Nevada Office of the State Engineer to approve and control the amount of groundwater pumped from a certificated water right. Solar Millennium intends to meter all wells to be used during construction and operation of the proposed Project. Water supply and use is described in section 2.3.5 in the Final EIS.

Response to Comment No. 02-09-07

See response to Comment No. 02-09-01.

Response to Comment No. 02-10-01

Dust monitoring stipulations will be determined by the Nevada Department of Environmental Protection - Bureau of Air Pollution Control (NDEP-BAPC). Before construction can commence on the Project site a Surface Area Disturbance Permit must be obtained, and within it a Dust Control Plan must be developed that includes best practical methods of fugitive dust control to be used by the permittee to control fugitive dust in detail. NDEP-BAPC has complete regulating authority over projects in this location considered to be minor sources in regards to air emission control and monitoring. This topic is addressed in section 3.1.

Response to Comment No. 02-10-02

See response to Comment No. 02-10-01.

Response to Comment No. 02-10-03

In the absence of Nye County and Nevada State noise code regulations, the EPA 55 dBa noise code threshold was adopted and applied to the project. Mitigation measures to minimize noise impacts during construction and operation of the project are described in Section 4.5.4.

Response to Comment No. 02-11-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 02-12-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 02-13-01

Solar Millennium will be responsible for relocation of any utilities affected by the construction of the proposed project. All costs will be incurred by Solar Millennium.

Response to Comment No. 02-13-02

See response to Comment No. 02-13-01.

Response to Comment No. 02-14-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 02-15-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 02-16-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 02-17-01

The right-of-way applications for BLM lands north of the proposed project site are still pending. The Proponent intends to move Amargosa Farm Road approximately 0.25 miles south of the existing roadway. The realigned portion of Amargosa Farm Road would extend from the vicinity of Sandy Lane to Valley View Road; a distance of approximately 3.5 miles. The terms and conditions associated with the realignment of Amargosa Farm Road are subject to the Development Agreement made by and between Nye County and the Proponent. A copy of the Development Agreement is provided in Appendix F.

Response to Comment No. 02-18-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 02-19-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 02-20-01

The BLM land immediately north of the Project area has a pending solar energy development right-of-way application on file with the BLM Pahrump Field Office (Cogentrix – NVN 083150). The Proponent filed an overlapping or "second-in-line" right-of-way application on these lands (NVN-087366); however, subsequent discussions between Cogentrix and BLM staff indicate Cogentrix intends to seek approval to develop a solar energy project at this location within the next 2 to 3 years. Although the BLM's right-of-way regulations provide that conflicting applications may be resolved through a competitive process (see 43 CFR §§ 2804.23(c), 2806.50, it is unlikely that the Proponent's overlapping application could be processed in a timeframe that met the Proponent's objectives.

Response to Comment No. 02-21-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

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Comment Document 3
Public Hearing on the Amargosa Farm Road Solar Power Project Transcript
Pahrump, NV 4.13.2010

23 DAN RODRIGUEZ: Thank you. I'm Dan
24 Rodriguez. I'm the CEO of the Pahrump Chamber of
25 Commerce. Rodriguez is R-o-d-r-i-g-u-e-z. And on

1 behalf of our membership of 500 businesses in the
2 valley, and we do have members in Amargosa, members
3 in Beatty, members in Las Vegas, we're very excited
4 to see a project of this nature in this area.
5 And the way the economy has been with the
6 potential of bringing more business, more jobs, more
7 money into the county is a good thing. And I really
8 commend everyone thus far of looking at all the
9 issues and all the, you know, crossing all the Ts and
10 dotting all the Is.
11 And this is a phenomenal experience that I
12 know that Solar Millennium is going through, and for
13 all of us it's a new experience. And on behalf of
14 our membership, we want to cross our fingers and
15 hopefully welcome you to our community as a major
16 employer. Thank you very much.

Comment No. 03-01-01

Response to Comment No. 03-01-01
Comment noted. The BLM appreciates the commenter's participation in the EIS process

Comment No. 03-02-01

17 MATT LYDON: That's Matt, M-a-t-t, last name
18 is L-y-d-o-n. I'm a business representative from
19 Plumbers and Pipe Fitters Local 525 and we stand in
20 favor of this project. We have 244 of our members
21 live in Nye County and hopefully it will give them
22 some employment opportunities. Thank you.

Response to Comment No. 03-02-01
Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Comment No. 03-03-01

23 DARRELL FAG: My name is Darrell Fagg,
24 F-a-g-g is my last name. I'm with the Ironworkers
25 Local 433. I also have quite a few people that live

1 here in Pahrump that asked me to come and state that
2 the work for big time, we need the work real bad and
3 we can also use some new members that live in this
4 area and up in Amargosa. So we're looking forward to
5 starting as soon as possible.

Response to Comment No. 03-03-01
Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Comment No. 03-04-01

CORDELL SANDERS: Cordell Sanders, that's C-o-r-d-e-l-l, S-a-n-d-e-r-s. I'm a resident of Southern Nevada. I'm in support of the project. I'd like to see it employ people in Amargosa and in Pahrump. And it's a project that, put it this way, it will employ anybody that has ability to do good work out here in Amargosa and Pahrump. That's it.

Response to Comment No. 03-04-01
Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Comment No. 03-05-01

13 RANDY SOLTERO: My name is Randy Soltero,
14 R-a-n-d-y, S-o-l-t-e-r-o. I represent the Sheet
15 Metalworkers Union here in Southern Nevada. I'm a
16 resident of Southern Nevada. And we have members
17 that live out here, and so certainly that's a big
18 deal for us to see a project like this come about.
19 But what I believe is more important is that
20 I've had the opportunity to work with the people from
21 Solar Millennium and to see that they truly are a
22 responsible partner. They are looking to do the
23 right thing and I think you see that with the
24 dry-cooling system that they're using for this plant
25 rather than the wet-cooling system.

Response to Comment No. 03-05-01
Comment noted. The BLM appreciates the commenter's participation in the EIS process.

1 I've traveled to Spain to look at projects
2 that they have over there and see that they are very
3 responsible and very concerned about the
4 environmental impact that could happen on a community
5 or region, and they take those steps to make sure
6 that those issues are addressed and are a responsible
7 partner in a community. And so that's probably -- as
8 a resident of Southern Nevada, that's probably what's
9 most important to me.

Comment No. 3-5-1 (continued)

10 And again we would also like to see the
11 folks from the valley, Amargosa Valley, Beatty,
12 Pahrump go to work. It's another big issue to us,
13 but again the environmental portion of it is equally
14 as important. Thank you.

Comment No. 03-06-01

15 BILL VERBECK: Thank you. Bill, B-i-l-l,
16 Verbeck, V-e-r-b-e-c-k. I represent EDEN, the
17 Economic Development Authority for Nye County, along
18 with Great Basin College, our Career Connections,
19 which is basically a workforce development center.
20 I applaud again Solar Millennium and all the
21 Amargosa people, certainly your advisory board that
22 has brought this to this particular state of
23 development.
24 Obviously on behalf of the college and EDEN
25 I fully support this project. I join with the folks

1 here that we too want to see jobs. It's all about
2 the economy and jobs when it comes down to it, and we
3 look forward to working with our union good folks in
4 partnership in anticipation that we can put people to
5 work. Particularly we do have OJT funds and other
6 resources we can bring to the party along with
7 training, so I look forward to meeting you gentlemen
8 later and working with you all the way through the
9 process. Thank you.

Response to Comment No. 03-06-01
Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Comment No. 03-07-01

10 JONATHAN DAVID MCMAHON: I am a Local 88
11 member. I work in Vegas. It's the only work we
12 have. I've been laid off for a while. One of my
13 biggest concerns is I don't want to see what happened
14 with the prison happen with this job out here. You
15 get an outside, out-of-state contractor. There's
16 enough people in this state that need the work that
17 are willing to do the work and are, excuse me, very
18 good at what we do.
19 The work needs to stay here and it needs to
20 stay with our brothers. And bring it on is probably
21 one of the best things that could possible happen to
22 this community, Vegas. We commute all the way to
23 Vegas every day. 2:00 o'clock, 3:00 o'clock in the
24 morning we get up, we travel. We get there, we get
25 the job done. It's usually a 16-hour day because

1 it's four hours back and forth. We make sure we get
2 the job done.
3 Now them guys coming out here, if there's
4 work, you're damn straight they're going to come out
5 here. The guys from Beatty, same difference.
6 Amargosa is a stone's throw compared to going to
7 Vegas. Keep the work here as opposed to giving it
8 away like they did with the prison up the road.
9 Thank you. I'm sorry, Jonathan David McMahon
10 J-o-n-a-t-h-a-n, M-c-M-a-h-o-n.

Response to Comment No. 03-07-01
Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Comment No. 03-08-01

15 LOYAL WATKINS: Loyal Watkins, L-o-y-a-l,
16 W-a-t-k-i-n-s. I'm a 26-year resident of Pahrump,
17 and everything that I've read and heard about you
18 guys is good, and we look forward to it and hope you
19 get it. Thanks.

Response to Comment No. 03-08-01
Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Comment Document 4
Public Hearing on the Amargosa Farm Road Solar Power Project Transcript
Las Vegas, NV 4.14.2010

Comment No. 04-01-01

4 MATT LYDON: That's Matt, M-a-t-t, Lydon,
5 L-y-d-o-n. I'm a representative of Plumbers and Pipe
6 Fitters Local 525. We stand in favor of this
7 project. We feel that it will create a good economy
8 for the rural areas, Amargosa, Pahrump, and we're
9 totally in favor of this project. Thank you.

A response to this comment is provided on a separate page following this comment document.

Comment No. 04-02-01

10 LAMARE JONES: Good evening to the panel.
11 My name is Lamare Jones, L-a-m-a-r-e, Jones,
12 J-o-n-e-s. I'm representing International
13 Brotherhood of Electrical Workers, Local 357. We are
14 truly definitely in favor of the project and we'd
15 like to have great consideration of having Nevadans
16 working is the only thing I can say.

A response to this comment is provided on a separate page following this comment document.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 04-03-01

JOHN HIATT: John Hiatt with Red Rock Audubon Society, that's H-i-a-t-t. As the first project in the Amargosa Valley to reach this level or this point in the process of approval, I think it's important that this EIS -- this EIS will set the precedent for all the rest of the many projects proposed in that valley, hence it's very important what happens here.

I'm a little bit puzzled and perplexed by

Comment No. 04-03-02

some of the stuff that I see in that EIS. I see, for instance, under Biological Impacts I see that there's no mention of any mitigation for biological damage. I'm kind of surprised at that since there's mitigation proposed for other things like soils but nothing for biological.

Comment No. 04-03-03

Under Water, for drawing, I'm very happy it's dry cooling as opposed to wet cooling but I'm still surprised at how much water is going to be used: 250 gallons a minute, 24/7, 365 days a year would be the average withdrawal.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 04-03-04

12 And when it talks about what happens with
13 that water, it says that basically there will be no
14 problems with any wastewater created. I'm assuming
15 that a lot of that water is going to go for washing
16 mirrors. I'm sure you're not going to use the
17 groundwater as it comes out of the pipe for that,
18 you're going to purify it, and that means that
19 there's going to be a brine stream as part of the RO
20 process. Where is that going to go? Is that just
21 going to be put back in the ground to eventually get
22 down to groundwater again?

Comment No. 04-03-05

23 Process water for the wet cooling of
24 ancillary equipment, there's going to be wastewater
25 from that which will also contain anti-scale

1 chemicals and so on that are necessary to make that
2 work. What's going to happen to that? There's no
3 mention whatsoever of hazardous water that will be
4 coming off of that, or maybe it's not hazardous but
5 at least contaminated water.

Comment No. 04-03-06

6 And there's really no discussion about
7 impacts on surrounding area and how the surrounding
8 area will really impact this. For instance, sand
9 movement in that area when the wind blows is a major
10 issue, but I really don't see that discussed and
11 mentioned as a major issue.

Comment No. 04-03-07

12 I don't know if you people have really done
13 thorough studies of what kind of pitting you can
14 expect on your mirrors, but if you look at any kind
15 of a bottle or aluminum can or anything else that's
16 out there in that area now and seen what it looks
17 like after it's been there for a year, it's covering
18 is sandblasted off of it.
19 So I think those things really need to be
20 looked at in detail, and I don't see the information
21 in this document that I thought should be there on
22 those. So I'll also be providing written comments
23 but those are some initial comments. Thank you.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 04-04-01

24 CORDELL SANDERS: Cordell Sanders, that's
25 C-o-r-d-e-l-l, S-a-n-d-e-r-s, and I'm here, I

Responses to these comments are provided on a separate page following this comment document.

1 represent Sheet Metalworkers Local 88. And I'm here
2 in favor of the project because it's green energy.
3 It's something that's needed in Nevada. We should be
4 taking advantage of the sun that's out here. It's
5 going to employee people in Amargosa, Pahrump and
6 here in the valley and I support it.

Comment No. 04-05-01

7 DONALD MULHERN: Donald Mulhern,
8 M-u-l-h-e-r-n. I'm with Sheet Metalworkers Local 88
9 representing members here in Southern Nevada. I just
10 want to stress the point that these jobs that are
11 going to be created out here need to go to Southern
12 Nevada residents.
13 I've been out on Public Works projects.
14 There's 50 percent out-of-state people working on
15 them and that's unacceptable with the talent that's
16 in Las Vegas and Southern Nevada. A lot of our
17 members live in Pahrump which is a stone's throw
18 away. I think that should be mandatory, that local
19 residents of Southern Nevada be the first ones on the
20 project. Thank you.

A response to this comment is provided on a separate page following this comment document.

Comment No. 04-06-01

21 ROBERT CONWAY: Robert Conway, C-o-n-w-a-y.
22 I just feel that this project is a benefit to the
23 community, to the state, to the environment and to
24 all the residents of Nevada. I think it will not
25 only provide some jobs during the construction

A response to this comment is provided on a separate page following this comment document.

1 portion but that all of the crafts that will be used
2 during the construction will help a lot of residents
3 looking for a career as opposed to just a job.
4 Any of the folks that we start in our
5 apprenticeship training program, along with all the
6 other building crafts, we don't just provide a single
7 job. Once they become an apprentice, they're on the
8 path to a career. It's a lot more than just this one
9 job. So any of the residents that end up working on
10 this job could end up being a permanent member of
11 whatever craft it is they become trained in for their
12 entire working career.
13 And that's pretty much all I really wanted
14 to say. I just think it's a great idea. In regards
15 to everybody trying to go green, I think this is a
16 good, another good step towards that.

Comment No. 04-06-02

17 And with the tax base that exists in
18 Amargosa Valley now, they barely have enough funds to
19 sustain basic necessities. The amount of taxes that
20 this will bring in for the local community can only
21 make things better, not just for the residents but
22 especially the kids, you know, in regards to the
23 schools and any after-school programs or recreational
24 facilities that might be created along with all of it.
25 I think the tax base on this is supposed to

1 be somewhere on the scale of two to three times the
2 current budget for the whole area. I know those are
3 all projections so I can only go off of what I've
4 been told, but with fingers crossed I'd like to think
5 that it works out to be just that way so that the
6 courts, fire services, police services, hospital,
7 ambulance service, you know, all the necessities that
8 a good little community needs could only be helped by
9 something like this out in the middle of nowhere I think.

A response to this comment is provided on a separate page following this comment document.

10 WILLIAM H. DEWITT: This is to the Bureau of
11 Land Management, Renewable Energy Project Manager,
12 4701 North Torrey Pines Drive, Las Vegas.
13 To whom it may concern: We own property on
14 the corner of Casada Way and Amargosa Farm Road
15 directly across from Solar Millennium's proposed
16 solar project. We have been active landowners in
17 Amargosa since the early 1990s. Our land has a mix
18 of farming, residential and commercial uses. Solar
19 Millennium's proposed project will border on our
20 property on the west, north and east sides.

Comment No. 04-07-01

21 Solar Millennium would like to relocate Farm
22 Road to a quarter mile south of its current position.
23 As adjacent landowners, we support the relocation of
24 the road because we believe a new and improved road
25 will benefit the community.

A response to this comment is provided on a separate page following this comment document.

1 The existing paved road is at a substandard
2 condition. It is not graded to current standards and
3 is prone to closure during flooding. Floods can
4 cause vehicle delays and public safety problems. A
5 new road will eliminate these issues by bringing the
6 road up to current engineering standards.

Comment No. 04-07-01
(continued)

7 Moving the road a quarter mile south will
8 also allow Solar Millennium to have their entire
9 project located north of Farm Road. If the road is
10 not moved far enough south, the power plant and
11 related buildings will have to straddle both sides of
12 the road. This does not seem sensible to us. It
13 will be better for the community if all Solar
14 Millennium's facilities are on the north side of Farm
15 Road.
16 To our knowledge we're the only landowner
17 along Farm Road that are adjacent to the proposed
18 solar site. We support the relocation of Farm Road
19 because we think a new and improved road will help
20 the community prosper in the future.
21 And it's signed William H. De Witt and
22 Mary R. De Witt, my wife.

RESPONSES TO COMMENT NO. 04-01-01 THROUGH 04-07-01

Response to Comment No. 04-01-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 04-02-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 04-03-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 04-03-02

Mitigation for impacts to biological resources is provided in Sections 4.6.1.4 and 4.6.2.4 as well as in Appendix A.6. Final mitigation measures for federally listed species have been developed as a part of the Section 7 consultation between BLM and USFWS.

Response to Comment No. 04-03-03

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 04-03-04

Process and wastewater management is described in sections 2.3.5.

Response to Comment No. 04-03-05

Wastewater produced under the wet-cooled alternative is described in Section 2.4.

Response to Comment No. 04-03-06

Dust monitoring stipulations will be determined by the Nevada Department of Environmental Protection - Bureau of Air Pollution Control (NDEP-BAPC). Before construction can commence on the project site a Surface Area Disturbance Permit must be obtained, and within it a Dust Control Plan must be developed that includes best practical methods of fugitive dust control to be used by the permittee to control fugitive dust in detail. NDEP-BAPC has complete regulating authority over projects in this location considered to be minor sources in regards to air emission control and monitoring.

Response to Comment No. 04-03-07

Parabolic trough technology has been in use for over 30 years. Experience to date shows that mirror reflectance is maintained at near beginning of-life performance over several decades of use. However, a small number of mirrors break each year, largely as a result of severe wind gusts. A program to periodically replace broken mirrors is included in Solar Millennium's Operation and Maintenance plans and costs.

Response to Comment No. 04-03-08

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 04-04-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process

Response to Comment No. 04-05-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process

Response to Comment No. 04-06-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process

Response to Comment No. 04-06-02

Comment noted. The BLM appreciates the commenter's participation in the EIS process

Response to Comment No. 04-07-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process

BLM, Pahrump Field Office
Attn: Greg Helseth
Renewable Energy Project Manager
4701 N. Torrey Pines Drive
Las Vegas, NV 90130

May 3, 2010

solar_millennium@blm.gov

RE: Amargosa Farm Road Solar Energy Project

Dear Mr. Helseth,

Thank you for the opportunity to comment on the draft EIS for the Amargosa Farm Road Solar Energy Project. We have some concerns about the potential impacts of this project on the natural resources of the Amargosa Valley and surrounding areas.

Comment No. 05-01

Groundwater resources: A major concern is the groundwater resource in this very arid area. We appreciate the decision by the developer to not proceed with a wet-cooled option but 400 acre feet of water per year is still a lot of water in this very dry desert. We are disappointed that the draft EIS doesn't really address the issue of the Amargosa Valley hydrographic basin as an over-allocated and over-pumped basin. Nor does the document acknowledge that there may be long-term interstate impacts from continued groundwater pumping in the Amargosa Valley. The information that has been made available as a result of the Yucca Mountain project indicates that the groundwater underlying the Amargosa Valley is part of the Death Valley Regional Flow System. As such, groundwater pumping in the Amargosa Valley is likely to eventually impact spring flows in Death Valley and at Ash Meadows. The draft EIS fails to differentiate between pumping for agricultural use and pumping to support major industrial uses such as proposed by the developers of the subject solar energy generating facility. The volume of agricultural pumping is determined by the price of hay and electricity and rarely reaches the maximum allowed, while the industrial use will consume every bit of water permitted. As a new permanent use of groundwater is proposed, this is the appropriate time to require mitigation for groundwater pumping. We suggest that the proponent be required to purchase and retire groundwater rights equivalent to what they are planning on using. Because this is the first of several similar projects proposed for the Amargosa Valley it is essential that proper precedent be set which will allow these projects to be as sustainable as possible. We also suggest that the proponents of this and the other projects being proposed contribute funds so that the United States Geological Survey can complete its' groundwater flow model for the area and also extend that model to the southern part of the Amargosa drainage. It is imperative that appropriate studies be carried out so that we can understand how groundwater moves into and through the Amargosa Valley since it is clear that the Valleys' groundwater is not being replenished by local rainfall.

Comment No. 05-02

Comment No. 05-03

Invasive plants: Currently, there are significant invasive plant problems associated with agricultural development in the Amargosa Valley and this project could greatly increase

Responses to these comments can be found on a separate page following this comment document.

Comment No. 05-03 (Continued)

the problem if not managed properly. Grading for the installation of the facility will create an ideal environment for the proliferation of weeds and runoff water from mirror washing will provide enough moisture to cause a permanent weed problem. The draft EIS does not detail how weed growth will be controlled. Will it be done with persistent herbicides? If so, this means that the land will really not be reclaimable if and when the project is terminated.

Comment No. 05-04

Flood control and drainage: The draft EIS states that drainage issues will be addressed by constructing a drainage channel around the periphery of the project and possibly an offsite detention basin upstream of the project. Redirection of sheet flooding flows to channels will have significant hydrologic impacts downstream of the project due to increased flow volumes during rain events. If an upstream detention basin is constructed that will also have environmental impacts by reducing wildlife habitat and providing another opportunity for the proliferation of invasive plant species. Drainage is not just a matter of protecting the proposed facility from flood damage but also a matter of the downstream impacts of changing the drainage pattern of an area of several thousand acres. This section of the document is inadequate.

Comment No. 05-05

Cumulative impacts: The cumulative impacts section of the document acknowledges that there is pressure from the Department of the Interior to increase the output of renewable energy from public lands but then states that unless a final Plan of Development for a project has been submitted, the BLM is not obligated to consider that potential project in its cumulative effects analysis. We believe that this is not the proper approach to analyzing cumulative impacts. We believe that the cumulative impacts analysis should be based on the assumption that the majority of these projects will be built in some form. If this is not done then there is no way to deal with the impacts when and if those projects are constructed. It is not feasible to mitigate for the impacts of major industrial development after it has happened. It can only be done by looking forward, not backward. Another alternative would be to put a cap on the number of acres in any particular valley that would be allowed for industrial development and base the cumulative effects analysis on that acreage cap. However the problem is addressed, the mitigation requirements must be spelled out prior to issuance of right of way permits.

Comment No. 05-06

Dark night sky: One of the features of the Amargosa Valley at present is the very dark night sky. Historically, electric power generating facilities are brightly illuminated at night with no consideration given to the light pollution emitted. We feel that lights at this and other proposed electric generating facilities should only be "on" as needed and all light sources should be shielded so that the light source itself is not visible to off site observers.

Comment No. 05-07

In conclusion, the two areas in the draft EIS that are critically important are the discussions of water use and the cumulative impacts of industrialization of the Mojave Desert for renewable energy production. As the first EIS for a renewable energy project in southern Nevada, the environmental impacts analysis in this document will set the standard for all the projects to come. It is essential for the future of the Mojave Desert that the full long term impacts of renewable energy projects be fully and carefully

Responses to these comments can be found on a separate page following this comment document.

Comment No. 05-07 (continued)

evaluated in a transparent process, and that we do not irreversibly degrade and destroy one of the last great open landscapes in the United States.

Sincerely,

John E. Hiatt
Conservation Chair, Red Rock Audubon Society
8180 Placid Street
Las Vegas, NV 89123

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RESPONSES TO COMMENTS 05-01 THROUGH 05-07

Response to Comment No. 05-01

The BLM's action for this EIS is to either grant or deny Solar Millennium's application for a right of way on lands managed by the BLM. The BLM must decide whether, and if so, under what conditions it will grant a right of way to enable construction and operation of the proposed project. The BLM has no authority to make a determination as to the sufficiency of groundwater to support future development in the project area. As part of the water appropriation permit application review and authorization, the Nevada State Engineer has the authority to approve and control the amount of groundwater pumped from basins in Nevada. The Nevada State Engineer will determine what measures would be taken should a basin become overextended due to additional growth, drought conditions, or uses by existing or pending water right holders in the basin. To address uncertainties associated with groundwater use for project construction and operation, Solar Millennium has agreed to acquire and forego the use of no less than 236 afy of existing water rights within the Amargosa Desert Hydrographic Basin (No. 230). Details regarding specific mitigation measures are provided in Appendix A in the Final EIS.

Response to Comment No. 05-02

Solar Millennium proposes to contribute $6,000 annually, for the life of the project, to the operation and maintenance of the existing Amargosa Monitoring Network. At current cost levels, $6,000 is the estimated cost of operating 3 monitoring wells for one year. This includes field measurements and overhead costs. Based on Euclidean geometry, three non-collinear points in space are required to define a plane. In this case, the simplified groundwater table is the defined plane and non-collinear points are monitoring wells in the network.

The Amargosa Monitoring Network is an integral component of the Death Valley Regional Flow System model (DVRFS) and the Southern Amargosa Embedded model (SAMM). SAMM is a refinement to a portion of the DVRFS which will enable improved modeling of the Amargosa Valley by utilizing a smaller grid size and more detailed hydrogeologic framework. To date, BLM has contributed $250,000 and committed additional future support towards the most recent update of DVRFS and SAMM, as well as $30,000 to the Amargosa Monitoring Network for the next 4 years of operation.

Response to Comment No. 05-03

As stated in Appendix A.6, a Noxious Weed Management Plan will be developed in conjunction with the BLM using only BLM-approved herbicides and methods. Information regarding herbicide use and development of the Noxious Weed Management Plan can be found in Sections 4.6.1.4 and 4.13.1.5.

Response to Comment No. 05-04

Information about Jurisdictional Waters, Drainages, and Riparian Areas has been added to Section 3.4 and 4.4 in the Final EIS.

Response to Comment No. 05-05

The DEIS followed Council on Environmental Quality guidelines in developing the cumulative analysis. In addition, the final EIS contains substantive improvements in the cumulative analysis, and the reader is referred to Section 4.17 of the FEIS for further information on cumulative analysis.

Among other things, that section explains why many proposed solar projects likely will not be built, but also fully evaluates cumulative impacts of assuming many are.

BLM is preparing a Solar Programmatic EIS that may amend land use plans to allow or restrict solar and other renewable energy development on BLM lands, including by establishing solar energy development zones.

Although the PEIS will not be done in time for BLM to make a decision on the Proponent's right-of-way application, the BLM Field Office is working with BLM in Washington, D.C. to ensure consistency with the developing PEIS to the extent possible.

Response to Comment No. 05-06

The Final EIS proposes shielding and as-needed lighting as stated in Section 4.12.5 Mitigation, "The Proponent shall consider location and type of lighting to minimize potential light pollution to the greatest extent practicable. Measures may include (but not be limited to) light hoods/shields, directional lighting, minimum required brightness, setbacks from project perimeter, and 'as-needed' usage." These measures will significantly reduce night lighting pollution.

Response to Comment No. 05-07

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

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"David Sweetman" <d-dsweetman@att.net>

03/27/2010 05:08 PM

To <solar_millennium@blm.gov>
cc <shielarau@nvweb.net>
Subject N-084359 2800 (NVS3100) Draft EIS for Amargosa Solar

Hello Greg,

In review of the CD of the draft EIS, I noted the following:

Comment No. 06-01

1. The summary is not clear what the "dust hazard" (not just PM_{10} or $PM_{2.5}$) results are of clearing all vegetation from ~ 4000 acres of land. There should be some identification of how much dust/sand will be moved as a function of wind velocity. For example, when the wind velocity exceeds 40 mph, there will be a dust/sand hazard, whether there is vegetation or not. Since the land is cleared, the minimum velocity to generate sufficient dust or sand to cause problems downwind needs to be identified and specific mitigation methods identified. The detailed description has some highly technical information, but that information is not correlated to a useful description of what is likely to occur when the wind blows.

Comment ID 06-02

2. While the use of 400 afy for dry cooling is a major improvement over wet cooling, there is no quantification of recovery. For example, when used for irrigation, ~ 65% of the water used is returned to the local area. None of the water used for makeup (~ 25% of the annual usage?) is recovered and I suspect most of the water used for cooling will not be recovered (at least not locally). So, using water for cooling is not the same as for irrigation and there needs to be some estimate of actual recovery, both locally and wherever else. The model identified in Chapter 3 and described in Appendix B did not clarify the issue.

Comment No. 06-03

3. There should be some comparison of the water sustainability of the project. For example, if the project uses (with no recovery) 400 afy and the occupied land is ~ 6000 acres and the annual moisture is ~ 1/4th afy, then the project is using less water than is provided by nature (assuming moisture recovery is > 30% (moderate permeability??). There is review of water conditions for the entire area, but not specifically within the project land area. The appearance is that the 400 afy is trivial compared with total water usage and regeneration within the total area (which is probably true), but there should be details on the specifics within and directly adjacent to the project.

Comment No. 06-04

4. There is no reason why the project could not have a virtually infinite life (i.e., well past the proposed 30-year potential decommissioning); however, there will be required replacement of various components during the 30 years of projected operation. What are the expected life times of the HTF, the reflectors, the tracking mechanisms, the turbines, the salt storage, etc.??? When will replacement be no longer economically viable?? How long will the project affect (or not affect) the local environment??

Comment No. 06-05

5. You mention "radionuclide contamination at the Nevada Test Site" but do not identify if some of those radioactive materials are present and detectable at areas outside of the Test Site, specifically is there any surface radioactivity from the Test Site that would be further transported by this project. My guess is the answer is NO, but there should be some clarification that the above/below ground nuclear events over the preceding ~ 50 years have had little or no effect on the composition of the surface in the project area. Similarly, there should be identification that if

Responses to these comments can be found on a separate page following this comment document.

Comment No. 06-05 (continued)	and when any radioactive materials are stored or processed at Yucca Mountain, there would be no known effects in the project area.	
Comment No. 06-06	6. Figure 2.5 Plant Schematic is quite nice; however, there is no schematic, theory of operation, specifications, or detailed description of the operation of the "dry" cooling tower. While there are textbooks on cooling tower theory, the specifics of the cooling tower that will actually be used should be described in detail.	Responses to these comments can be found on a separate page following this comment document.
Comment No. 06-07	On a separate topic, the cover letter noted a 45-day comment period; however, since there were no dates in the letter, one can only guess when the actual comment period occurs (given that monitoring the Federal Register is a major undertaking).	

Thanks.

David Sweetman
P.O. Box 189
Dyer, NV 89010
775-572-3359
www.quadd.info

RESPONSES TO COMMENTS 06-01 THROUGH 06-07

Response to Comment No. 06-01

Emissions models included fugitive dust from grading in their calculations in the Draft EIS and Final EIS.

Response to Comment No. 06-02

A study conducted by the USGS (Professional Paper 1703E) at an adjacent field to the proposed Project location estimated that return flow from irrigation ranged from 8% to 16% not 65%. Losses to evapotranspiration make up most of the loss.

Response to Comment No. 06-03

Comment is unclear. Chapter 3.4 provides a general overview of current water resources conditions in the regional and local area. Chapter 4.4 describes how implementation of the Proposed Action (dry-cooled alternative) or other alternatives would affect local water resources in the regional and local area.

Response to Comment No. 06-04

The expected useful life of major components is anticipated to be 30 years or more. With proper maintenance, the hardware should last through the useful life of the overall plant, which could reach 40 years. However, given the quantities of tracking mechanisms and collector tubes, Solar Millennium expects a very small percentage of the devices to fail and need replacement each year. This component replacement requirement would be reflected in their maintenance plans and costs. Experience to date shows that mirror reflectance is maintained at near beginning-of-life performance over several decades of use. However, a small number of mirrors break each year, largely as a result of severe wind gusts. A program to periodically replace broken mirrors would be included in Solar Millennium's Operation and Maintenance plans and costs. Rotating equipment such as turbines and salt pumps are also expected to have 30+ year life. A major turbine overhaul is planned every 5 years or so; pump impellers will need to be repaired or replaced periodically. But with a sound maintenance program, this equipment will last 30 years or more. BLM's requirements mandate reclamation of the proposed project site following Project decommissioning. A decommissioning plan will ensure that these requirements are met.

Response to Comment No. 06-05

It is unclear if the question is addressing dust or water, in regards to surface radioactivity.

Dust creation mitigations are a part of the dust control plan that will be developed before a surface area disturbance permit is issued as required by NDEP-BAPC. Dust is also monitored during operations through permitting with NDEP-BAPC.

Groundwater quality is discussed in the Draft EIS, and according to DOE 2008 "Elevated concentrations of fluoride, sulfate, arsenic, and total dissolved solids are present in some areas, and traces of naturally occurring uranium are also present;" radionuclides were not tested for.

On March 3rd, 2010 the Department of Energy filed a motion to withdraw the Yucca Mountain License application; at this time there is no reason to believe that the Yucca Mountain project will ever be in operation.

Response to Comment No. 06-06

It is beyond the scope of this EIS to include theory of operation, detailed specifications, or detailed descriptions of the operation of a dry-cooled solar plant. The level of detail regarding plant components and their process described in Chapter 2 is sufficient for analysis in this EIS.

Response to Comment No. 06-07

See Chapter 5 (Consultation and Coordination) in the Final EIS. The 45-day comment period is consistent with the Council on Environmental Quality regulations for implementing the National Environmental Policy Act regarding the review of draft environmental impact statements. Significant effort was made to advise people of the schedule and duration for the review well in advance. The BLM announced dates and locations of public meetings on their website, and media releases including newspaper advertisement and postal mailers.

NATIONAL SYSTEM OF PUBLIC LANDS

Solar Millennium LLC

RECEIVED
Bureau of Land Management
APR 09 2010
LAS VEGAS FIELD OFFICE
Las Vegas, Nevada

COMMENT FORM

Amargosa Farm Road Solar Energy Project

Draft Environmental Impact Statement

Ed & Grace Munton
Name — Organization (if applicable)

P.O. Box 219 — Amargosa Valley — NV — 89020
Address — City — State — Zip Code

Add to Mailing List: YES [X] NO [ ] Withhold personal information: YES [ ] NO [ ]

Comment No. 07-01

COMMENT:
In 1969 we had a flood that closed Highway 95 for 3 or 4 days. If this were to re-occur, how would that affect Solar Millennium?

(Use additional sheets as needed.)

Public comments must be postmarked by May 3, 2010

SEND COMMENTS TO:

Gregory Helseth, Las Vegas Field Office, 4701 N. Torrey Pines Drive, Las Vegas, NV 89130

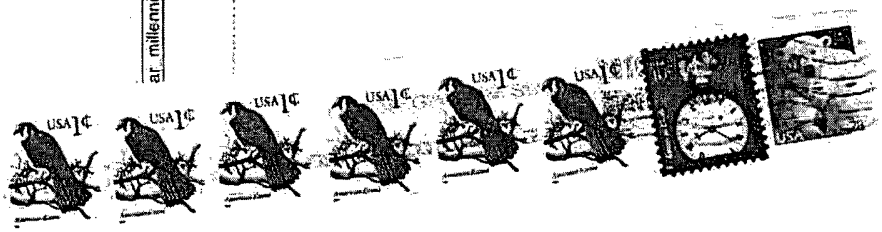
**Copies of comments will be available for public review at the local BLM office during regular business hours. Individuals requesting their personal information be withheld from public review or from disclosure under the Freedom of Information Act must check "Yes" in the appropriate box. Such requests will be honored to the extent allowed by law.*

Response to Comment No. 07-01
The flood that occurred in 1969 generated approximately 3,330 cfs of stormwater runoff at the gage station just upstream of US 95. The Solar Millennium project site has been designed with perimeter flood control facilities to accommodate the 100-year storm event flow determined to be approximately 9,600 cfs. Flooding that may occur offsite and upstream of the project due to insufficient existing flood control structures is outside the control of this project.

Mr. Edward Munton
PO Box 219
Amargosa Vly, NV 89020-0219

ar_millennium@blm.gov):

Place Postage Here



Bureau of Land Management

NATIONAL SYSTEM OF PUBLIC LANDS

Mr. Gregory Helseth
Las Vegas Field Office
4701 N. Torrey Pines Dr.
Las Vegas, NV 89130

B913052301

FRC

Environmental Impact Statement for:

Amargosa Farms Road, Amargosa Valley, NV 89020

Review & Comments

By; Richard Williams April, 2010
cplrich@cox.net
702-396-4549

PDF Chapter 1

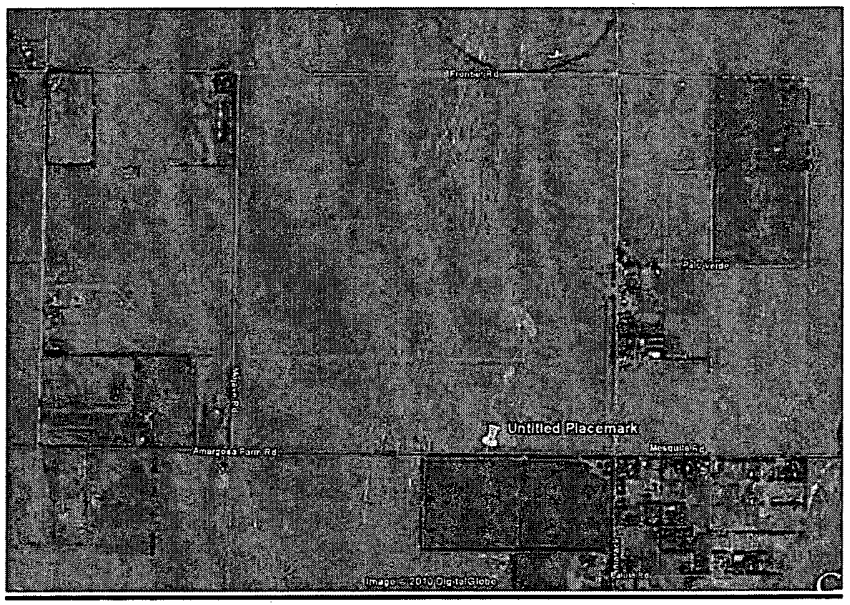
Introduction Purpose & Need.

Because of executive order 13212 of May 18, 2001, these two long awaited projects are nearing the final review and approval process. Since I have been asked to review and comment on these two Solar Thermal Projects, I have endeavored to ask only those questions that are either not clear to me in the PDF files that were sent to me. It is my own personal hope to see that these two and many more take place while influencing our environment at the smallest possible levels. Therefore, as I review and study all of the documentation sent I will endeavor to respectfully add my thoughts, comments and questions.

First of all I have closely zeroed in on the building site using Google Earth.

Comment No. 08-01	Comment: I notice that there are "stretch marks" shown in the aerial views I have seen of this particular area and wonder if these are rainwater wash marks in the earth. It is impossible to tell by these photos if that will be large enough to interfere with the project and necessitating some sort of diverting of this wash. It might not be large enough to seriously impact the job site and if occasional rain water does indeed collect and run through this area then something should be planned to avoid any washouts of structures that will be built. Thought: Maybe a new reinforced stone or cement storm water path could be established to protect the environment and the job site.	Response to Comment No. 08-01 See Appendix E - Conceptual Stormwater Control Plan

Page Break: Please Scroll Down.

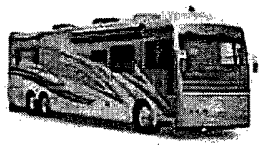


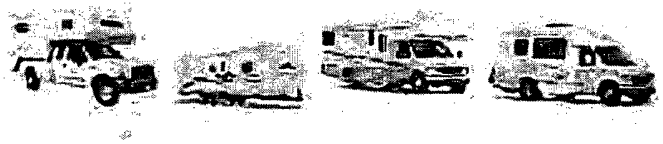
PDF Chapter 2:

Comment No. 08-02

Questions: Concerning manpower requirements for this project some thoughts came to mind about the remoteness of this area and where the labor force might be coming from like places in Las Vegas, Pahrump or even out of state. As an idea that could be a suggestion about this subject, I thought it might be advisable to establish very close by or even on site an area that could provide housing such as trailer homes or RV's. This in itself would be more eco-friendly rather than car pooling or even individuals driving very long distances to get to the jobsite. It must also be kept in mind that with some roads and highways during the winter months traveling can be dangerous with ice and snow. I do see what looks to be farmland or private homes in the area so electrical provisions could be easily done to provide those staying on site a means of having light and power while working there. I have seen this in my own electrical construction career on some distant jobsites. Men in construction that are willing to travel far to those jobs would need a place that could provide them with some sort of home comforts.

Response to Comment No. 08-02
There are no plans for Solar Millennium to provide on site or nearby housing for workers.





Comment No. 08-03	Comment: In 2.2.1.2 It was mentioned that a collaborative venture would be made using the Ferrostaal AG company out of Spain that has a lot of experience already in this Solar Trough Power production. This can help to avoid costly mistakes and inefficiencies that are sure to come into the public's eye because many will be interested in this project.	Response to Comment No. 08-03 Comment noted. The BLM appreciates the commenter's participation in the EIS process.
Comment No. 08-04	Idea: I think the differences between the wet and dry systems can be minimized more to bring them in line with one another. 6-9% inefficiencies could be offset with some "out of the box thinking." If we can put a man on the moon we can build this solar power plant and make it work effective and efficient.	Response to Comment No. 08-04 Comment noted. The BLM appreciates the commenter's participation in the EIS process.
Comment No. 08-05	Question: On your Fig 2-4 Sheet 1 you show wind fencing but it only seems to be on the west and east sides of the project. Maybe I just cannot see it in the plot plan but this does concern me a little because of the heavy winds experienced here in the desert that destroyed one of my own solar projects.	Response to Comment No. 08-05 Wind fencing will be located on the east and west side of the project.
Comment No. 08-06	Observation: There was a large amount of text in this PDF that described in detail the operational parameters of this power plant design. I did get through it because I found it interesting. I thought it was complete but somewhat lacking in its ability to relate some basic information to those that might not be well versed in Power Production Facilities. I was able to follow along with most but not all of the information. Seeing it in action would clarify certain points.	Response to Comment No. 08-06 Comment noted. The BLM appreciates the commenter's participation in the EIS process.
Comment No. 08-07	In another point here I was wondering if it would be important to have every solar trough "grounded" due to perhaps and short circuits in motors or feeds to them or in the event of a possible lightning strike. I am sure studies have been done on historical meteorological records of storms in this area. The peripheral grounding grid could serve as an additional grounding means to the individual point grounds for each row or group. Maybe they should all be tied in together with proper cad welding techniques. This whole PDF was very informative and detailed and I do have a good idea about what it takes to put it together.	Response to Comment No. 08-07 The proposed project will be designed to meet all applicable industry standards to reduce the risk to human health and the environment, and would be operated in a manner that complies with safety standards and practices.

PDF Chapter 3

Comment No. 08-08	Comment: After looking over the Chapter 3 PDF on environmental risks that could affect the local area I am convinced that all the possible studies have been done and that all affects that could be have been evaluated. As an interesting note I was in construction before hard hats were mandated and also before Environmental Impact Statements had to be done for new construction. It is also interesting to note that most of New York City was built before any of these before mentioned things were in place. Pretty soon every new proposed baby will have to have an EIS done before it is okayed to have one. I am in full	Response to Comment No. 08-08 Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Comment No. 08-09 (continued)

agreement into protecting the only earth we have to live on. We can go to the extremes at times.

Observation: I know these reports take years to put together and I can only spend so much time going over everything. From toxic fumes to green house gases, vegetation growth to dust hazards for those in the area, everything seems to have been thought about and planned for. Well done.

Comment No. 08-09

Thought: Since no location can be considered ideal with all parameters meeting a perfect score, the only other reasonable thought or idea is notably what I have heard from the Japanese of late. They are suggesting and maybe already planning to build similar power plants in orbit around the earth. Even this would have an impact on the earth. Maybe some shadowing and the beamed down microwave converted energy would have to have receiving stations that would have to have a no fly zone and buffer. Modern civilization cannot go backward in time and standards of living. We must have our electrical energy needs met with every possible form and way of providing it.

Response to Comment No. 08-09
Comment noted. The BLM appreciates the commenter's participation in the EIS process.

PDF Chapter 4

Comment No. 08-10

Comment: Truly this whole plan was studied quite well with a lot of extraneous information beyond my own scope of expertise but I browsed through it anyway. I am not overwhelmed by the taking away of approximately 106,000 acres for these projects away from the natural wildlife in the area. There is a possibility that some species might even benefit from it. As in all projects animal life suffers to some extent like big buildings where migrating birds slam into the sides when some fly at night. Aircraft running into large flocks of birds like the emergency landing in the Hudson of recent times and even wind generators that kill something like a half of one percent of all birds killed by various means.

Response to Comment No. 08-10
Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Comment No. 08-11

Suggestion: I did not see anything like what I am about to propose in this Chapter but I could have overlooked it with my failing eyesight. Could there be something or someway of warning off any flocks of birds that might inadvertently land on the focus point of these solar troughs? (1/2 of the Radius) This could kill them with the highly concentrated solar rays or fry their feet to the solar tube absorber rendering them permanently disabled. In other words has any one planned for a scare tactic to keep them away from these troughs? If this hasn't been planned for, or there is nothing in the budget planning allocation that was set aside for this, I suggest that there should be. Even a simple noisemaker can scare migrating birds away. It might also help to avoid opposition from animal rights groups on this point.

Response to Comment No. 08-11
The focus points of the solar troughs are insulated heat condenser elements that can be touched without risk of injury.

PDF Chapter 5

Comment No. 08-12

Comment: In 5.3 of Chapter 5 PDF I noticed that I am not listed as one of the reviewers of this EIS study. I really didn't expect to see myself listed but I do hope you take me seriously about this review and commenting I am doing. I know I am in distinguished company when I am doing this review and that is reward enough. This Chapter did give me an overview of who all was involved.

Response to Comment No. 08-12
Comment noted. The BLM appreciates the commenter's participation in the EIS process.

PDF Chapter 6

Comment No. 08-13	**Comment: I could be in solitary confinement for 20 years and not get through the extensive Bibliography of Resources that you listed in this Chapter. However, I am sure someone reviewing these documents will want to check further something that was written in the EIS draft. Great List.**	Response to Comment No. 08-13 Comment noted. The BLM appreciates the commenter's participation in the EIS process.

PDF Chapter 7

Comment No. 08-14	**Comment: I really appreciated this Glossary of terms as where used within these PDF documents. Since many of the words and terms were not known to me, I did find them extremely useful in gaining a foothold to grasp the material presented.**	Response to Comment No. 08-14 Comment noted. The BLM appreciates the commenter's participation in the EIS process.

PDF Chapter 8

Comment No. 08-15	**Comment: The Index provided was also very helpful to find once again those references that were made about certain items or points.**	Response to Comment No. 08-15 Comment noted. The BLM appreciates the commenter's participation in the EIS process.
Comment No. 08-16	**Final Comment: I truly believe in the coming of age in Solar Power Technologies. I am behind it in every way that I can help you. I wish all the collaborating governmental agencies, local city governments, interested groups, individuals and societies the best of luck. Sincerely Submitted.**	Response to Comment No. 08-16 Comment noted. The BLM appreciates the commenter's participation in the EIS process.

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NATIONAL SYSTEM OF PUBLIC LANDS

Solar Millennium LLC

COMMENT FORM

Amargosa Farm Road Solar Energy Project

Draft Environmental Impact Statement

CURTIS STENGEL PLANNING COMMITTEE

Name Organization (if applicable)

HC 69 BOX 454J AMARGOSA VALLEY, NV 89020

Address City State Zip Code

Add to Mailing List: YES [X] NO [ ] Withhold personal information: YES [ ] NO [X]

Comment No. 09-01

COMMENT: IF SOLAR MILLENIUM GETS THEIR WAY AND CHANGES AMARGOSA FARM ROAD TO ACCOMMODATE THEIR DEVELOPMENT PLAN WHO PAYS FOR R & R OF: POWER LINES, PHONE LINES AND FIBER OPTIC LINE ?

I DON'T WANT FARM ROAD RIGHT OF WAY CHANGED. THE TIME IT TAKES FOR EMERGENCY SERVICES TO REACH MY NEIGHBORHOOD IS ALL READY TOO MUCH TIME.

(Use additional sheets as needed.)

Response to Comment No. 09-01
Solar Millennium will be responsible for relocation of any utilities affected by the construction of the proposed project. All costs will be incurred by Solar Millennium.

Public comments must be postmarked by May 3, 2010

SEND COMMENTS TO:

Gregory Heiseth, Las Vegas Field Office, 4701 N. Torrey Pines Drive, Las Vegas, NV 89130

"Copies of comments will be available for [illegible] review at the local BLM office during regular business hours. Individuals requesting [illegible] information be withheld [illegible] review or from disclosure under the Freedom of Information Act must check "Yes" [illegible] Such request [illegible] to the extent allowed by law

NATIONAL SYSTEM OF PUBLIC LANDS

Bureau of Land Management

For more information, please contact Gregory Helseth (solar_millennium@blm.gov).

FOLD HERE

Curt Stenger
FROM
HC 69 Box 454J
Amargosa Valley, NV
89020

LAS VEGAS NV 890
12 APR 2010 PM 5 T

Bureau of Land Management
Pahrump Field Office
Attention: Gregory Helseth
4701 North Torrey Pines Drive
Las Vegas, NV 89130

William and Mary De Witt
PO Box 10
Amargosa Valley, NV 89020
(775) 372-5355
FAX (775) 372-5356

April 14, 2010

BLM, Las Vegas Field Office
Attn: Greg Helseth
Renewable Energy Project Manager
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

Re: Amargosa Farm Road Solar Energy Project (NVN-084359)

To Whom It May Concern:

Comment No. 10-01

We own property on the corner of Casada Way and Amargosa Farm Road, directly across from Solar Millennium's proposed solar project. We have been active landowners in Amargosa Valley since the early 1990s. Our land currently has a mix of farming, residential, and commercial uses.

Solar Millennium's proposed project will border our property on the west, north, and east sides. Solar Millennium would like to relocate Farm Road to a quarter mile south of its current position. As adjacent landowners, we support the relocation of the road because we believe a new and improved road will benefit the community.

The existing paved road is at a substandard condition. It is not graded to current standards and is prone to closure due to flooding. Floods can cause vehicle delays and public safety problems. A new road will eliminate these issues by bringing the road up to current engineering standards.

Moving the road a quarter mile south will also allow Solar Millennium to have their entire project located north of Farm Road. If the road is not moved far enough, the power plant and related buildings will have to straddle both sides of the road. This does not seem sensible to us. It will be better for the community if all of Solar Millennium's facilities are on the north side of Farm Road.

To our knowledge, we are the only landowners along Farm Road that are adjacent to the proposed solar site. We support the relocation of Farm Road because we think a new and improved road will help the community prosper in the future.

Sincerely,

William H. De Witt
Mary R. De Witt

Response to Comment No. 10-01
Comment noted. The BLM appreciates the commenter's participation in the EIS process.

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Planning Department
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Water Department
336 South Jackson St.
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Phone: (760) 878-0001
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April 21, 2010

BLM, Las Vegas field Office
Attn: Greg Helseth
Renewable Energy Project Manager
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

Re: Draft Environmental Impact Statement for the Amargosa Farm Road Solar Energy Project, DES 10-10

To Whom It May Concern:

Thank you for the opportunity to provide input regarding the draft Environmental Impact Statement for the Amargosa Farm Road Solar Energy Project (DEIS). The County Board of Supervisors has consistently expressed its support for appropriate renewable energy projects, and encourages smart and sustainable economic development. However, the DEIS is flawed in several respects, which should be addressed in the final EIS or a recirculated DEIS. The following bullets summarize the Inyo County Departments of Water and Planning comments regarding the DEIS.

Comment No. 11-01

- ***Table 2-5.*** Under Water Resources, the section that should discuss the wet cooled alternative discusses the dry cooled alternative. This is possibly an editorial error. In any case, the wet cooled alternative's impact on water resources should be presented.

Response to Comment No. 11-01
The sentence describing the Proposed Action (dry-cooled alternative) in the wet-cooled column has been deleted.

Comment No. 11-02

- ***Section 4.4.*** We recognize that the USGS Death Valley Regional Flow System Model is the best available tool for conducting an analysis of the potential impact of the project on regional groundwater resources. However, as acknowledged in the DEIS, because of the regional nature of the model, the large cell size, the regional scope of the calibration data set, potential inaccuracies in the historic pumping data set, and simplification of the geology, the model's ability to accurately render water level changes at Devils Hole is limited. We urge you to treat the model results cautiously, to require as mitigation a groundwater monitoring program that will detect any adverse impacts to groundwater levels or flows early, and reduce groundwater extraction in the

Response to Comment No. 11-02
Comment noted. Model results are treated cautiously and used in conjunction with other data to evaluate potential impacts to groundwater resources. The limitation of the model is fully described in the EIS.

Comment No. 11-02 (continued)

event that impacts to groundwater resources and groundwater dependent resources become foreseeable.

Comment No. 11-03

- ***Section 4.2.2.*** The analysis of the impact of the wet cooling alternative on water resources is inadequate, and if this alternative is selected, the DEIS must be revised and recirculated. It is assumed that 4,600 acre-feet per year (afy) of existing water rights could be acquired and used for the project with no impact to water resources. This conclusion rests on the assumption that any rights so acquired are currently being fully exercised, and that the transfer of those rights to the project would not affect the hydrology of the basin in any way. The location and status of the groundwater rights that would need to be acquired to implement the wet cooled alternative is not identified in the DEIS, therefore it cannot be concluded based on the information in the DES that those rights are presently being fully exercised. Given the practice of periodically fallowing alfalfa fields, it is likely that rights held by Amargosa Valley irrigators are not fully exercised every year. To evaluate the potential impact of the wet cooling alternative on water resources, a model scenario similar to one done for the dry cooling alternative should be developed: 2003 pumping plus an additional 4,600 afy extracted from wells in the vicinity of the project for the period 2010 - 2039. This model scenario should be used to evaluate the effect of project on Devils Hole water levels, and on groundwater discharge in the Furnace Creek area of Death Valley National Park. A credible analysis of the wet-cooling alternative may reveal significant impacts, thereby supporting the preferred dry-cooling alternative.

Response to Comment No. 11-03
The BLM preferred alternative is the Proposed Action (dry-cooled alternative). The BLM acknowledges the commenter's statement that water rights may not be fully exercised each year; however, as such, it would very difficult to evaluate the potential effects a wet-cooled power plant would have on Devils Hole water levels and the Furnace Creek area of Death Valley National Park. As cited in section 4.4.2, it could be assumed that the water that would be acquired for a wet-cooled option is fully used on an annual basis by the current water right holder, in the current capacity. Any change to recharge rates from conversion of the water right from agricultural use to industrial use would be dependent upon the amount of water used historically, types of crop grown, and site conditions (e.g. soil type, method of irrigation, etc).

Comment No. 11-04

- ***Section 4.11.2.*** It is noted that the wet cooled alternative would require 840 acres of irrigated land to be fallowed. Such a large area of permanently fallowed land is potentially an impact to air quality due to blowing dust. We are concerned with this potential impact due to the project's location adjacent to Death Valley National Park.

Response to Comment No. 11-04
Under the Proposed Action (dry-cooled alternative), the Proponent intends to use up to 600 acre-feet of the annual duty associated with the project well (the annual duty is 602 afy). The 160 acres of agricultural lands associated with this water right, will be fallowed during the 39-month construction period. Following construction, the Proponent will continue to lease 400 afy from the water right holder for operational water for the life of the project, and relinquish the 203 acre-feet back to the water right holder. The Nevada State Engineer generally allots 5 afy/acre for irrigation; therefore the water right holder will be allowed to irrigate up to 80 acres with the remaining 203 afy annual duty, and the remaining 80 acres will be fallowed. Accordingly, any dust-related impacts from land fallowing will be mitigated as part of the proponents compliance with the surface area disturbance permit, as well as other permits they may be obtained through NDEP-BAPC.

Thank you for the opportunity to comment on the DEIS. It is recommended that the dry-cooled alternative be adopted. You may call Joshua Hart at (760) 878-0263 or email him at jhart@inyocounty.us, or Dr. Harrington at (760) 878-0001 or by email at bharrington@inyocounty.us, if you have any questions. Please send any future notices regarding actions that may impact the County to the Planning Department's attention.

Sincerely,

Mike Conklin
Planning Department Director

Dr. Robert Harrington, Ph.D.
Water Department Director

cc: Board of Supervisors; Kevin Carunchio, CAO; County Counsel; Greg James; Michael King; Public Works Department; Death Valley National Park; file

Valley Electric Association, Inc.

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April 23, 2010

Mr. Greg Helseth
Renewable Energy Project Manager
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

Re: Comments to the Solar Millennium Draft Environmental Impact Statement

Dear Mr. Helseth:

Valley Electric Association (VEA) has received a copy of the Draft Environmental Impact Statement (EIS) for Solar Millennium, LLC's proposed 2-250MW solar generating facility (BLM record number N-084359). We have had an opportunity to review the document and our comments to the document are as follows:

Comment No. 12-01

1. Section 2.2.1.1-the EIS makes reference to 2-232MW solar generating plants. The nameplate rating of the plants as provided by Solar Millennium to VEA for the purpose of executing system studies is 2-250MW.

Response to Comment No. 12-01
The proposed Project includes the construction and operation of two dry-cooled solar power plants, each with a nameplate capacity of 250 MW and a net output of approximately 232 MW.

Comment No. 12-02

2. Section 2.34- Valley Electric would like to propose that the section reads as follows:

The Project electrical components consist of the solar field electrical systems, the electrical system within the power blocks, and the Project switchyard. Transmission of power from the proposed Project will be "wheeled" through Valley Electric Association (Valley Electric). Valley Electric Association is currently reviewing Solar Millennium's application for interconnection. System studies are being conducted to identify what system improvements will be required as a result of this proposed interconnection. Valley Electric will make a separate right of way application and prepare the associated Environmental Assessment as required to accommodate any facility improvements identified as a part of the interconnection study.

Response to Comment No. 12-02
Section revised to include the commenter's proposed text.

Comment No. 12-03

3. Section 3.11.3.6- The EIS states that the power lines adjacent to the project area are 115kV distribution lines. VEA's power lines in that area are not distribution lines, and they are rated 138kV, not 115kV.

Response to Comment No. 12-03
The information has been revised in the FEIS.

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Comment No. 12-04

4. Section 3.9.4.2-VEA would like to change the description in this section to the following: "Valley Electric is a nonprofit cooperative electric utility that is based in Pahrump, Nevada".

Response to Comment No. 12-04
The requested edits have been made in the FEIS.

Comment No. 12-05

5. Section 4.17.3-The location of Solar Millennium's proposed project will require that VEA relocate roughly four (4) miles of distribution feeder lines for all of the feeders north of our Valley Substation. VEA also would like to clarify the first sentence in the fifth paragraph on page 4-105. The transmission lines owned by VEA (138kV voltage) that are that are located south of US 95 and west of NV 160 as referenced in this paragraph will not be upgraded. In order to accommodate this solar project a new 230kV line along with a new 230kV switchyard would have to be built. If the proposed solar project does not materialize, it will not be necessary to add the new 230kV line, the new 230kV switchyard, or to upgrade the existing 138kV line.

Response to Comment No. 12-05
This information has been added to Section 2.3.4 in the FEIS. The construction of the new line and switchyard are part of VEA's long-term upgrade plans, which VEA has developed and may undertake apart from large-scale solar development within VEA's service area. Finally, if the Amargosa project is not approved or built, the new line and switchyard may serve any project that would be built on the same lands, pursuant to right-of-way applications now pending before BLM.

Comment No. 12-06

6. Table 4-32 : There is a typographical error in this table: in the first column that references Valley Electric, the dates should be 2010-2012, not 2010-1012. Also, the existing 138kV lines near the project site will not be upgraded; new 230kV lines as well as a new 230kV switchyard will be added for interconnecting Solar Millennium's project to the VEA electrical grid.

Response to Comment No. 12-06
The requested edits have been made in the FEIS.

Comment No. 12-07

7. General Comment: With respect to how Valley Electric is characterized, we would prefer in the report to be referenced to in the following manner: *Valley Electric Association, Inc.* or *VEA* for short once the full name is used.

Response to Comment No. 12-07
References to Valley Electric Association have been changed in the FEIS per commenter's request.

VEA appreciates the opportunity to review this document as well as your willingness to consider and incorporate our comments into the final EIS. If you have any questions regarding our comments, please do not hesitate to call me at (775)727-2164, or email me at carletl@vea.coop.

Sincerely,

Carlet Langford

Carlet Langford, P.E.
Manager of Engineering
Valley Electric Association, Inc.

Valley Electric Association, Inc.

September 23, 2010

Mr. Greg Helseth
Renewable Energy Project Manager
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

RE: Additional comments on Solar Millennium Draft EIS, BLM Record No. N-084359

Dear Mr. Helseth

Valley Electric Association, Inc. ("VEA") previously submitted a letter dated April 23, 2010 concerning the Draft Environmental Impact Statement (DEIS) for Solar Millennium LLC's proposed 2-250 MW Amargosa solar generating facility (BLM Record No. N-084359). In that letter, VEA stated, among other things:

In order to accommodate this solar project a new 230kV line along with a new 230kV switchyard would have to be built. If the proposed solar project does not materialize, it will not be necessary to add the new 230kV line, the new 230kV switchyard, or to upgrade the existing 138kV line.

This statement is clarified as set forth below:

There are a number of large scale solar generation projects currently in VEA's interconnection queue, some of which have right-of-way applications currently before BLM for land near or adjacent to the improvements described in BLM Record No. N-094359 (the "Improvements"). As such, the Improvements could possibly provide the critical infrastructure necessary for the delivery of power from a variety of projects. VEA intends to seek approval of these transmission upgrades so long as the costs of those efforts are fully sponsored by an interconnection customer, whether that is Solar Millennium, or ultimately an interconnection customer with a later queue position in VEA's interconnection queue.

VEA intends to submit a SF-299 right-of-way application and a Plan of Development for the Improvements within the next ninety days. VEA's submission of these documents to BLM will initiate BLM's permitting and environmental review process for the Improvements.

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Thank you for your consideration of these comments. If you have any questions, please do not hesitate to call me at (775) 727-2138, or email me at curtl@vea.coop.

Sincerely,

Curt Ledford
General Counsel

CC: Ralph Hollenbacher, Solar Millennium, LLC

April 23, 2010
Gregory Helseth
Pahrump Field Office
Bureau of Land Management
4701 North Torrey Pines Drive
Las Vegas, NV 89130-2301
solar_millennium@blm.gov

Dear Gregory,

On behalf of the Nevada Wilderness Project (NWP), we wish to provide comments on the Draft Environmental Impact Statement (DEIS) for the Amargosa Farm Road Solar Energy Project (solar project) proposed by Solar Millennium. We support the proposed action for a dry-cooled solar thermal power project. We do not support the wet-cooled alternative because of the concerns about over-allocation of existing water use in the Mojave region of Nevada and the fragile nature of the natural resources in the area. We also do not support the no action alternative because we recognize the need to reduce the United States' dependency on non-renewable sources of energy in order to ameliorate global climate change and national security threats.

Comment No. 13-01

Response to Comment No. 13-01
Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Comment No. 13-02

We ask that the Bureau of Land Management (BLM) consider the cumulative impacts of land use and management activities as they are related to cultural resources and wildlife and their habitats in a more holistic fashion. We believe that additional development of BLM lands should not occur unless significant wildlife habitat mitigation or conservation on public lands occurs in tandem.

This solar project and other future development on BLM lands should have conservation offsets for cumulative impacts in the form of strong, permanent protection of landscapes that possess high quality wildlife habitats, cultural or other unique resources. This protection may be in the form of administrative designations, assuming such designations have strong, enforceable management language that will remove threats to further degradation of resources, or through specific agency requests for legislative designations that would add important areas to the National Landscape Conservation System. This is a much-needed paradigm shift for how the BLM does business regarding development projects on public lands.

We recognize that there is significant pressure on the BLM to help solve our energy and climate crisis, but we see this push as an opportunity to provide clean, domestic energy while also providing strong conservation on other BLM lands that would leave wildlife, cultural and other resources with better, permanent protection than they are currently afforded. With the BLM's multi-use mandate, consideration of the important role of the agency as a steward for wildlife habitats and other unique resources has to be made during this push for renewable energy production on public lands, and we do not want to see this opportunity to provide stronger protection of resources in tandem with development squandered.

Response to Comment No. 13-02
Comment noted. The DEIS followed Council on Environmental Quality guidelines in developing the cumulative analysis. The BLM's action for this EIS is to either grant or deny Solar Millennium's application for a right of way on lands managed by the BLM. The BLM must decide whether, and if so, under what conditions it will grant a right of way to enable construction and operation of the proposed project. Overall management of BLM lands are described in District-specific Resource Management Plans. The Las Vegas RMP/EIS, approved by Record of Decision on October 5, 1998, guides management of BLM lands in the Southern Nevada District.

Please inform me of any further developments related to the Amargosa Farm Road solar project and the DEIS/NEPA process. We are happy to make ourselves available to meet and discuss or further develop any ideas and mitigation options that NWP can provide. Do not hesitate to contact me.

Sincerely yours,

John C. Tull
Conservation Director
Nevada Wilderness Project
8550 White Fir Street
Reno, NV 89523
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National Parks Conservation Association®
Protecting Our National Parks for Future Generations®

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400 South 2nd Avenue, #213
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Phone: 760-417-7867

April 27, 2010

Gregory Helseth
Bureau of Land Management
Pahrump Field Office
4701 North Torrey Pines Drive
Las Vegas, NV 89130-2301

Re: Comment on Draft Environmental Impact Statement for Proposed Amargosa Farm Road Solar Energy Project

Dear Gregory Helseth:

On behalf of our 320,000 members, the National Parks Conservation Association (NPCA) would like to thank you for the opportunity to comment on the Draft Environmental Impact Statement (DEIS) for Solar Millennium's Proposed Amargosa Farm Road Solar Energy Project. NPCA is a non-profit organization dedicated to the protection and enhancement of National Parks for current and future generations. Our members care deeply for America's shared natural and cultural heritage that is preserved by units of the National Park System.

Comment No. 14-01

NPCA recognizes the need to combat the worst effects of global climate change through a diversified approach that includes the development of industrial-scale renewable energy generation systems, coupled with energy conservation, energy efficiency measures, and distributed generation. Our organizational position on large-scale renewable energy generation systems in desert landscapes is that they are preferentially sited on disturbed lands, utilize the least water intensive technologies, cause the least possible harm to natural systems, are built close to existing transmission corridors, and provide benefit to communities with minimal long-term environmental, health, or safety costs.

A response to this comment is provided on a separate page following this comment document.

Solar Millennium has proposed the construction and operation of two 232-MW solar power plants. The project would occupy approximately 4,350 acres of what is currently desert habitat, and would include the construction of solar fields, power blocks, an office and maintenance building, parking area, laydown area, switchyard, and a stormwater detention basin. Additional elements of the proposed project would include access roads and optional water pipelines. Solar

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Millennium's proposed solar energy generating system would utilize parabolic trough solar thermal technology to produce electrical power using steam turbine generators fed by solar steam generators.

Comment No. 14-02

Because the proposed location of this project is in the Amargosa Valley east of Death Valley National Park and has the potential to negatively impact both water levels in the Devils Hole unit of Death Valley National Park and the endangered Devils Hole pupfish (*Cyprinodon diabolis*), NPCA is encouraged that the preferred alternative in the DEIS is to employ air-cooled technology, which significantly decreases the water consumption necessary for the generation of energy. NPCA commends Solar Millennium and the Bureau of Land Management for this thoughtful approach to the intersection of energy generation and water consumption, particularly in the Amargosa Valley, where Devils Hole is located. The Nevada State Engineer has ruled that the Amargosa Desert hydrographic basin is over-appropriated by 18,000 acre-feet per year and applications for new water rights will be denied.

Because of the potential impacts to the critically endangered Devils Hole pupfish from the drawdown, and because of Death Valley National Park's mandate under the National Park Organic Act of 1916, the Endangered Species Act of 1973, and the California Desert Protection Act of 1994 to preserve unimpaired for future generations the water and wildlife resources under its stewardship, NPCA has continuing concerns that we feel must be addressed in an EIS for the proposed project. We have organized our concerns and recommendations into the following categories:

Responses to these comments are provided on a separate page following this comment document.

Comment No. 14-03

- **Full disclosure of planned water sources and corresponding analysis.** The DEIS describes three water sources for the project and presents groundwater model analysis for impacts to water levels in Devils Hole based on these wells. If Solar Millennium plans to change this approach to acquiring groundwater for this proposed project, that change must be clearly presented and transparently disclosed to the public in the DEIS process. Solar Millennium and the BLM cannot wait until the release of the EIS to revise groundwater analysis, particularly since this is such a crucial issue to the survival of the Devils Hole pupfish and the resources that Death Valley National Park was set aside to protect. Further, the BLM and Solar Millennium must base their analysis of groundwater depletion impacts to Devils Hole on current and historic levels of water use for the actual water rights that Solar Millennium seeks to lease or

Comment No. 14-03 (continued)

purchase. If Solar Millennium purchases or leases rights to 400 acre-feet/year from a source that was not using its full amount of water, that will present a different net impact to Devils Hole. Groundwater modeling to predict that net impact should be disclosed to the public in the DEIS. If Solar Millennium plans to change its stated approach to acquiring groundwater for this proposed project, NPCA recommends that the BLM re-issue this DEIS with the analysis included and fully disclosed to the public for comment, as required by the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321-4347).

Comment No. 14-04

- **Clarification of amount of water needed for mirror washing.** The DEIS presents two different stated needs for the amount of water required for mirror washing (Section 2.3.6.1, "Water Requirements"). Table 2-3, "Summary of Operational Water Usage," projects 200 acre-feet/year for mirror washing under the dry-cooled alternative, while projecting 149 acre-feet/year for the wet-cooled alternative. There is no explanation provided for the discrepancy between these two projected mirror washing water requirements. Considering that this is a difference of 16,618,401 gallons each year in a hydrologic basin with a potential to impact Death Valley National Park's senior water right at Devils Hole, as well as the Devils Hole pupfish, NPCA requests that the DEIS provide a clear and transparent analysis of how much water is required for mirror washing for the preferred alternative of this proposed project.

Comment No. 14-05

- **Water mitigation.** Appendix B, the proposed project's Groundwater Monitoring Report, discloses that "an additional 400 afy of pumping reduces simulated water levels at Devils Hole by less than 0.05 ft or 0.6 in after 200 years." NPCA feels that any water drawdown in Devils Hole should be mitigated, and proposes a commonsense mitigation for this project of purchasing and retiring water rights at the same distance or closer to Devils Hole on a 1:1 ratio for the amount of water consumed. Under this proposed mitigation solution, for 400 acre-feet/year of consumption, 400 acre-feet/year would be retired from water rights at the same distance from, or closer to, Devils Hole than the proposed site of water extraction.

Comment No. 14-06

- **Clarity on the comparison of alternatives.** Table 2-5, "Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative"

Responses to these comments are provided on a separate page following this comment document.

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Comment No. 14-06 (continued)

provides no comparison between these alternatives. Instead, it appears that the impacts section of the "preferred alternative" has been cut-and-pasted into the "wet-cooled alternative" and the "no action alternative" for each one of the resource categories. NPCA recommends that this table be revised to provide the public with a real and meaningful summary analysis of the differences between the alternatives.

Comment No. 14-07

- **Analysis and discussion of the potential impact to Death Valley National Park's Night Sky Resources.** There is no discussion in 4.12, "Visual Impacts," or 4.19, "Cumulative Impacts," of the proposed project's impact to the night sky resources of Death Valley National Park, or the potential for the cumulative impacts of this proposal and reasonably projected future development in the Amargosa Valley region to impact the night sky resources of Death Valley National Park. NPCA recommends that this analysis be included in the DEIS.

Responses to these comments are provided on a separate page following this comment document.

Thank you for the opportunity to contribute to this process. The National Parks Conservation Association looks forward to continued involvement in the environmental process on this project. Please feel free to contact me directly at (760) 957-7887, or at DLamfrom@npca.org, in order to continue this dialogue to ensure that this proposed project does not degrade the federally mandated protection of Death Valley National Park.

Sincerely,

David Lamfrom
California Desert Field Representative
National Parks Conservation Association

RESPONSES TO COMMENT NO. 14-01 THROUGH 14-07

Response to Comment No. 14-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 14-02

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 14-03

The Draft EIS described three water sources under consideration for project use. Following issuance of the Draft EIS, it was determined that one of the three wells would fulfill the project water requirements. Solar Millennium has filed an application with the Nevada Division of Water Resources Nevada State Engineers Office to change the place and manner of use of this water right. The amount of water needed for the project has not changed. Therefore, the re-issuance of the Draft EIS is not required. This updated information is included in the Final EIS.

Response to Comment No. 14-04

The water needs for mirror washing cited in Table 2-4 in the Draft EIS was incorrect for the wet-cooled alternative. Under both the dry- and wet-cooled alternatives, water needs for mirror washing are 200 afy. This information has been revised in the Final EIS.

Response to Comment No. 14-05

See response to comment 05-01.

Response to Comment No. 14-06

The water resources summary in Table 2-5 has been updated for clarity.

Response to Comment No. 14-07

Visual impacts were based on preliminary engineering and design, which did not consist of a lighting plan. Therefore, effects to night sky associated with Death Valley National Park could not be assessed. However, the Proponent has committed to specific mitigation measures that will be incorporated in the FEIS that will mitigate impacts to night sky to the greatest extent feasible (i.e., mitigation of night lighting).

solar_millennium@blm.gov
Comment: Amargosa Farm Road Solar Energy Project DEIS

Draft Environmental Impact Statement for the Amargosa Farm Road Solar Energy Project (NVN-084359): BLM/NV/LV/ES-10/16+1793

From:

Michael Voegele
7404 Oak Grove Ave
Las Vegas, NV 89117

Comment on Flood Control.

Basis:

The flood control approach for the Amargosa Farm Road Solar Energy Project is summarized on page 2-34 of the Draft Environmental Impact Statement (DEIS):

> "The site will be graded generally following the existing contours of the site in order to minimize the amount of disturbance and to allow a balanced distribution of material. Flood protection of the property from off-site flows will be provided by means of a continuous concrete lined channel around the northern and western perimeter of the site. The channel will be designed to effectively intercept the 100-year storm event off-site runoff and convey the concentrated flow to the southwest corner of the property. The southwest corner of the property has been identified as one of the historic discharge locations of the Fortymile Wash. The channel will discharge within the property limits and energy dissipation facilities will be provided in order to disperse the concentrated flow back to a shallow sheet flow condition prior to leaving the property boundary."

Comment No. 15-01

The proposed solar field improvements described in the DEIS (based upon the Draft Conceptual Stormwater Control Plan provided in Appendix E) will change the historic drainage patterns within the boundaries of the Project site (page 4-20). The stated goal of the flood control plan is to maintain historic drainage patterns off site in both quantity and manner of flow in conformance with NRS Chapter 543 following guidelines set forth in Section 400 of the Hydrologic Criteria and Drainage Design Manual."

Considering that here are multiple Right-of-Way requests for solar facility development in the Amargosa Valley, it is imperative that there be a coordinated flood management planning effort. Without such an effort, there can be no confidence in the design bases for flood control for the individual facilities. Data or assumptions used in the design of

Response to Comment No. 15-01

A coordinated regional flood plan approach for the area was pursued jointly with BLM, Nye County and adjacent solar company right-of-way applicants. All parties agreed to the positive pursuit of the approach, however coordinated funding, schedule variations and design responsibility for such a facility was determined to be an overwhelming challenge at this point in time.

Flood control performed on an individual project basis can be achieved by discharging intercepted and conveyed storm flows in a manner consistent with historic quantity and manner prior to leaving the project property. This is precisely what the proposed project design proposes by use of detention/retention basins to limit post-development flows to pre-development levels and by using energy dissipating/ spreading structures to return the discharged flows to sheet flow in identified historic locations.

Comment No. 15-01 (continued)

flood control measures based on the current and historical streamflow and flood characteristics of the Amargosa River and Fortymile wash will change if the approach reported on page 4-112 of the DEIS were implemented.

> "An alternative for Regional Flood Control Facilities was presented to BLM and Nye County staff in 2009. The alternative would provide a regional off-site detention basin at the apex of the Fortymile Wash located north of US 95 and would effectively and considerably reduce existing condition peak storm flow downstream of US 95. Reducing off-site peak flows impacting the site, and other proposed facilities, would allow for reduction in size of perimeter flood control facilities necessary for protection of the Project site. All properties downstream of the detention basin would benefit from this approach."

The DEIS also concludes (page 4-22) : "[T]he Regional Flood Control concept ..... is currently under consideration as a viable alternative." The DEIS notes that all properties downstream of the detention basin would benefit from this approach and that the alternative is being evaluated by both BLM and Nye County staff.

Recommendation:

Comment No. 15-02

Implementation of a retention basin is a meaningful solution to flood control. Given the sparse historical flood data, the likelihood of significant flooding, and the ephemeral and migratory nature of braided washes, the flood control plans for all of the proposed solar facilities must be considered together. Further, the impacts of flood control for the various facilities are connected and need to be addressed as such. The intent of this comment is not to raise an impediment to the development of the Solar Millennium Amargosa Farm Road Solar Energy Project. Rather, it is provided to motivate continuation of work that is already started to develop a coordinatec effort to implement a retention basin designed to meet the needs of all of the facilities developed in the Amargosa Valley. As the DEIS notes, certification of flood zone location and flood damage prevention and permits are the responsibility of the Nye County Planning Department and must meet Nye County Code (page 1-15). Presumably, an effective retention basin would be located north of Highway 95, and the design should involve the Department of Transportation because of existing Right-of-Way for the highway. Nye County, the BLM, the Department of Transportation, and the developers should work together to develop the flood control plans for the areas with proposed solar facilities, whether or not a retention basin is selected as the appropriate approach for flood control. The EIS should reflect a commitment to this approach, and not just a statement that it is under evaluation .

Response to Comment No. 15-02

See response to Comment No. 15-01

John F. Bosta
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April 30, 2010

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

Southern Nevada District

Pahrump Field Office
4701 N. Torrey Pines

Las Vegas, NV 89130-2301

SUBJECT: Draft Environmental Impact Statement (EIS) for the Solar Millennium Amargosa Farm Road Solar Power Project, Nye County, NV

ATTN: Gregory Helseth, Project Manager

Thank you for the opportunity to comment on the Draft Environmental Impact Statement (EIS) for the Solar Millennium Amargosa Farm Road Solar Power Project, Nye County, NV.

Comment No. 16-01	I am concerned that the fast track of solar energy projects is not in the best interest of the citizens living in the Amargosa Desert of Nevada and the citizens of the United States. This fast track process will allow the foreign investors and corporations to collect the American Recovery and Reinvestment Act of 2009 (ARRA) for the 30% of the total cost of the project has been changed. Originally to qualify, projects had to break ground by December 31, 2010 and spend at least five percent (5%) of the total project cost in 2010.	A response to this comment is provided on a separate page following this comment document.

Comment No. 16-01 (continued)	However, First Solar in California reported to California/Nevada Regional Office of the Wilderness Society that the Treasury issued new guidelines at the end of March. Now, developers have the flexibility to begin construction by December 31, 2010 either on-site or off-site by beginning manufacturing of panels or other associated equipment intended for the specific project site. Companies will take on some risk by starting manufacturing off-site before they have their permits in hand. Developers do not need to receive their permits by the end of this year, which gives more flexibility to the permitting schedule. However, in order to meet the DOE loan guarantee, they will need their permits by September 2011.	
Comment No. 16-02	Before the Public meeting held in Amargosa Valley April 7, 2010 to review and comment on the Draft EIS, I had twp different conversation with two individuals about the EIS. 1. A BLM staff member expressed the fact that BLM hopes to complete the EIS process within 12 months instead of the usual 28 months or more. The timeline to complete the Final EIS is sometime in June 2010 and approve the Right of Way for this project. If this goal of less than 24 months is not completed the said project cannot begin construction before December 31, 2010. 2. A Solar Millennium staff member told me that Solar Millennium has built a factory in the east to manufacture the receiver tube that contains the heat transfer fluid. Is this off-site manufacturing?	Responses to these comments are provided on a separate page following this comment document.
Comment No. 16-03	However, the project construction has already begun without an approved ROW, for example: 1. Solar Millennium has already surveyed the footprint. 2. Using the name Amargosa Valley Solar 1, LLC applied for water rights permit number 79699 and permit number 79783 for 400 AFA to change the Place of Use (POU) and Manor of Use (MOU) of Permit 15893. The water right application mitigation is included in Appendix A – Proposed Avoidance, Minimization and Mitigation is Mitigation Measure A.4 WTR-3, which is a mitigation application for construction of the Draft EIS, which has not been approved.	
Comment No. 16-04	The fast track does not allow enough time for a complete public review of all applications of needed permits and studies required for this project.	
Comment No. 16-05	The ES-1.4.2 Wet-Cooled Alternative has been eliminated as an alternative by Solar Millennium, which was announced in a news release 1. **Berkeley, California – November 16, 2009** – Solar Millennium, LLC, a large-scale solar thermal parabolic trough power plant developer, today announced that it would utilize advanced dry-cooling technology for its two proposed solar thermal power plants being developed by the company in the Amargosa Valley outside Las Vegas. Solar Millennium, LLC, is the U.S. project development arm of Solar Trust of America, LLC, and an integrated industrial solar solutions company operating in the southwestern United	

Comment No. 16-05 (continued)

States.

2. Therefore, the Final EIS should contain only the alternatives, ES-1.4.1 and ES-1.4.3.

Comment No. 16-06

The ES-1.4.4 Other Alternatives Considered But Not Evaluated in Detail, in accordance with Title 40 CFR Section 1502.14 alternatives were not carried forward for further analysis if the alterative is inconsistent with the basis policy objectives of the 1998 Las Vegas Resource Management Plan/EIS, which is obsolete.

§ 1502.14 Alternatives including the proposed action.

This section is the heart of the environmental impact statement. Based on the information and analysis presented in the sections on the Affected Environment (§1502.15) and the Environmental Consequences (§1502.16), it should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public.

In this section agencies shall:

(a)Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.

(b)Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.

(c) Include reasonable alternatives not within the jurisdiction of the lead agency.

(d)Include the alternative of no action.

(e)Identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference.

(f) Include appropriate mitigation measures not already included in the proposed action or alternatives.

The adopted 1998 Las Vegas Resource Management Plan does not include renewable energy development of geothermal, wind, and solar power; management of site type rights-of-way for renewable energy and other uses; visual resources management; land tenure adjustments to meet community growth needs; evaluation of existing and potential new Areas of Critical Environmental Concern; Off-Highway Vehicle Designation and Special Recreation Management; and Nye County FEMA floodplain maps. The BLM should not allowed to tier insufficient Nye County Comprehensive Plan, non existing tortoise plans, and plans that have not been developed for renewable energy projects in the 1998 Las Vegas RMP/EIS.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 16-06 (continued)

BLM has not briefly discuss the reasons why the six alternatives in section ES-1.4.4 were eliminated from the detailed study pursuant to 1502.14 (a) & (b) other than quoting the section number.

Comment No. 16-07

Under the United State Constitution the powers of government are divided between the federal government and the state governments. One power of the states is zoning and land use. The BLM Resource Management Plan must be consistent with officially approved and adopted local land use plans, as long as such local plans are consistent with federal law and regulations pursuant to 43 CFR section 1610.3-2(e).

As the local government having jurisdiction and planning authority, Nye County Master Plan or Comprehensive Plan (NCCP) was adopted April 5, 1994, which has not been updated except for the Nye County Water Resources Plan August 3, 2004 and the Amargosa Valley Area Plan (AVAP) September 23, 2009.
The NCCP Section 2.2 Federal Lands; "The Federal Government owns and manages certain parcels of land within Nye County and has the ability to acquire additional lands pursuant to Article I, Section 8, Clause 17 of the U.S. Constitution and Chapter 328 of the Nevada Revised Statutes. Nye County intends to develop objectives, and polices for federal lands within Nye County."
1. The application for BLM ROW for land south of Farm Road conflicts with Advisory Town Boards request for BLM land at the corner of School Lane and Farm Road and the corner of School Lane and Ranch Road, which will be used for Future Community and Utility Facilities needed by the town. The AVAP Map 6 Public Buildings, Services and Facilities includes these two of five sites that the Advisory Amargosa Town Board asked Nye County to acquire for future town development.
2. Nye County made a prior request for these additional lands before Solar Millennium made the application for the solar project ROW.

Comment No. 16-08

The Adopted Amargosa Valley, Nevada AREA PLAN has not been considered in the design of the Solar Field. The Project Area Figure 1-2 page 1-7, Figure 2-3 DRY COOLING-REROUTE OPTION 1 page 2-11, and Figure 2-4 DRY COOLING-REROUTE OPTION 2 page 2-13 is a major change of design presented in Figure 9 Preliminary Site Layout within the ROW area page 18 of 71 Updated Plan of Development.
1. The Solar Fields have been designed to include the existing Farm Road as part of their project. This design conflicts the AVAP Map 4 Future Land Use. The Special Development Area for Solar, Wind, and Other is north of Farm Road.
2. The proposed development of T&T Road north of the solar field has not been included in the EIS. The ROW application does not include extending any roads north of solar field. This extension of the road would require a

Responses to these comments are provided on a separate page following this comment document.

Comment No. 16-08 (continued)

BLM road right-of-way, which require another EIS.
3. The new road must be constructed pursuant to Nye County Ordinance 135 Section 16.20.070 (A) Road or Street Dedication
a. Road right-of-way shall be dedicated to the County
b. Roads along a section line shall be 80 feet (40 feet on each side of the section line).

Comment No. 16-09

4. Solar Millennium presented two road alternatives at the Special Advisory Town Board meeting April 8, 2010 for the extension of T&T Road.
a. Extend T&T Road north all the way to Highway 95, which would pass through the Cogentrix right-of-way application.
b. Extend Frontier St. east from Valley View Blvd. to T&T Rd.
5. The GOAL TRN-5 to maximize the continuity of the street network to provide a direct system of access throughout the community to minimize response time for emergency vehicles and Policy TRN-5E to align all new roads and streets, whenever practicable, with existing roads and streets by continuation of the centerlines thereof will be eliminate the planned roads in AVAP Map 5 TRANSPOTATION. Frontier St. will be extended west to east between Valley View Blvd. to Powerline Rd.. Casada Way will be extended south to north between Farm Rd. and Frontier St.. T&T Rd. will be extended south to north between Farm Rd. and Frontier St..

Comment No. 16-10

6. The proposed ROW for Solar Millennium solar project use of the T.16S., R.48.E Sec.1-all; Sec.2-E½; Sec.11- E½; Sec.12-all and T.16S., R.49.E Sec. 5- W½, NW¼, E½, SW¼; Sec.6-all; & Sec.7-al is not consistent with officially approved and adopted local land use plans.

Comment No. 16-11

7. The existing Farm Road is a county road within the easement provided in the original land patents that were issue by federal land acts. When these patents were subdivided or parceled the federal easements were dedicated to the county for roads.
8. BLM would need to give and dedicated easements to the county to build new roads.
9. Private land would need to be parceled and easements given to the county for roads.
10. The county would need to dedicate the old Farm Road easements to BLM, which would be included in the approved ROW issued to Solar Millennium.

Comment No. 16-12

EIS Section 3.4.5.2 Flood Occurrence pages 3-33 & 3-34 provides information about a peak stream flow of approximately 3,000 cubic feet per second in 1995 that severely scoured and eroded the channel, causing extensive road damage to highway 95. Manmade channeling of the forty-mile wash into narrow culverts under the highway caused the damage. This same problem will occur when the forty-mile wash and the four other washes that originate on Yucca Mountain ROW flowing into the proposed ROW is canalled into concrete channels located at the northern boundary. The Conceptual Stormwater Control Plan, Appendix E is incomplete.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 16-13

1. Section 1.1 Project Overview & Study Purposes intended to provide only a conceptual plan of the project site from onsite and offsite storm flows.
2. The purpose of an EIS is to obviate the need for speculation by insuring that available data are gathered and analyzed prior to the implementation of the proposed action.

Comment No. 16-14

3. Section 2.1 Compliance uses methodologies that do not apply to Amargosa Valley. Nye County Guidelines for Design and Review of Development Engineering Submissions, Dated February 2005 (NCGDRDES), which was adopted by Resolution No. 2005-02 for the Pahrump Regional District only and not for the entire county. Per the Nye County Guidelines tiered the Clark County Regional Flood Control District's Hydrologic and Drainage Design Manual (CCRFCE Manual to be used for all methodologies not covered in the Nye County Guidelines.

Comment No. 16-15

4. The compliance references for uses methodologies are grossly misleading when they cite guidelines that are not the "applicable," lawful, EPA approved State Implementation Plan (SIP) for Nevada, Nye County, and Amargosa Valley.

Comment No. 16-16

5. There is no evidence of a public notice and notice of hearing noticing the public that the Solar Millennium intended to use the NCDGRDES as any part of a NEPA site specific or cumulative impact determination.

Comment No. 16-17

6. The Draft EIS does not take into consideration of the cumulative flood impact of of the other three proposed solar projects north of the Solar Millennium project.

Comment No. 16-18

7. The proposed Flood Plain Protection Plan in the Adopted Amargosa Valley, Nevada AREA PLAN has not been considered in the Conceptual Stormwater Control Plan.

a. Policy FPP-1C, which requires the necessary precautions to protect surrounding property. The floodwaters from the Tonopah Wash and Forty-mile Wash will diverted around the Project Area, which increase the flooding of the surrounding property.

b. Policy FPP-1D requires review of proposed drainage improvements by the Nye County Floodplain Administrator as a condition of project approval. As of the date Solar Millennium has not presented any plan for review and approval.

c. Policy FPP-1F requires that all new plans for development within or adjacent to a floodplain show the projects relationship to the floodplain and that the development will not endanger that project of the surrounding areas. The Conceptual Stormwater Control Plan shows only the protection of the project. The surrounding areas will be endangered by the run-on diverted around the project and the run-off from the Storm Drainage Outfall.

Comment No. 16-19

This ROW should not be approved by BLM until the Revision to the Las Vegas Resource Management Plan and Associated Environmental Impact Statement has been completed and approved for the Las Vegas Field Office and the

Responses to these comments are provided on a separate page following this comment document.

Comment No. 16-19 (continued)

Pahrump Field Office. Clark County and Nye County have different Master Plans and Ordinances. The revision of the 1998 Las Vegas RMP has to be separated into two RMPs, one for the Las Vegas Field Office and one for the Pahrump Field Office.

The federal land policy and management act, 43 U.S.C. section 1701, declared the national policy to be that "the national interest will be best realized if the public lands and their resources are periodically and systematically inventoried and their present and future use is projected through a land use planning process coordinated with other federal and state planning efforts." See 43 USC section 1701(a)(2).

43 U.S.C. section 1712(c) sets forth the "criteria for development and revision of land use plans." Section 1712(c)(9) refers to the coordinate status of a county which is engaging in land use planning, and requires that the "secretary [of interior] shall "coordinate" the land use inventory, planning, and management activities ... with the land use planning and management programs of other federal departments and agencies and of the state and local governments within which the lands are located."

Section 1712 also provides that the "secretary shall assist in resolving, to the extent practical, inconsistencies between federal and non-federal government plans." This provision also gives preference to those counties which are engaging in the planning process over the general public, special interest groups of citizens, and even counties not engaging in a land use planning program. In view of the requirement that the secretary [of the interior] "coordinate" land use inventory, planning and management activities with local governments, it is reasonable to read the requirement of assisting in resolving inconsistencies to mean that the resolution process takes place during the planning cycle instead of at the end of the planning cycle when the draft federal plan is released for public review.

43 CFR section 1610.3-2(a); The section further requires that the secretary [of the interior] shall "provide for meaningful public involvement of state and local governmental officials in the development of land use programs, land use regulations, and land use decisions for public lands." When read in the light of the "coordinate" requirement of the section, it is reasonable to read "meaningful involvement" as referring to on-going consultations and involvement throughout the planning cycle, not merely at the end of the planning.

Comment No. 16-20

The BLM has no duty to make its plan consistent with a local government plan, if the BLM is not notified by the local government of the existence of its local plan. The BLM was sent a draft of the AVAP for review and BLM made and returned comments on the draft. So, one can conclude that BLM has

Responses to these comments are provided on a separate page following this comment document.

Comment No. 16-20 (continued)

not been notified by the local government of the existence of the local plan, which is AVAP. The Revision of the 1998 Las Vegas RMP makes no reference to the AVAP.

Comment No. 16-21

BLM, Nye County staff, local governmental official and Solar Developers have met to discuss the mitigation measures in closed meeting, which excluded the public. The meetings were held in Beatty, which is not in the boundary of the Pahrump Field Office, on November 10, 2009 and April 28, 2010. These project changes and mitigations are now presented in the Draft EIS, which are inconsistent with the local AVAP.

Comment No. 16-22

The fugitive dust from unpaved roads and open land will be the dominant air pollutant, which is particulate matter PM_{10} and $PM_{2.5}$. Section 3.1.3 page 3-10 makes reference to the Pahrump Valley nonattainment for PM_{10} and the Memorandum of Understanding (MOU) successfully negotiated with EPA and the Nye County Ordinance to regulate construction and other ground-disturbing activities, and has implemented a mandatory program of Best Practicable Methods for use on all ground disturbances of 0.5 acres or greater,

1. This said MOU and Ordinance is for Pahrump Valley only and not the rest of the county.

Comment No. 16-23

Section 3.1.3 page 3-10 also makes reference to air quality data available for the Yucca Mountain Project. The Yucca air quality makes the follow comment in the EIS.

1. If there are not enough air quality data to determine the status of attainment of a remote or sparsely populated area, the area is listed as unclassified. For regulatory purposes, unclassified areas are considered to be in attainment. Section 176(c)(1) of the Clean Air Act requires Federal agencies to ensure that their actions conform to applicable implementation plans for achieving and maintaining National Ambient Air Quality Standards for criteria pollutants. In addition, this section of the Act assigns primary oversight responsibility to the agencies, not to the Environmental Protection Agency or the States. Specifically, for there to be conformity, a Federal action must not contribute to new violations of standards for ambient air quality, increase the frequency or severity of existing violations, or delay timely attainment of standards in the area of concern (for example, a State or a smaller air quality region). The Environmental Protection Agency general conformity regulations (40 CFR 93, Subpart B) contain guidance for determining if a proposed Federal action would cause emissions to be above certain levels in locations designated as nonattainment or maintenance areas. In this case, a maintenance area is a region that was previously in nonattainment, but which has been redesignated to an attainment area with a requirement to develop a maintenance plan.

Since the project area is located in an unclassifiable area, Solar Millennium should be required to conduct air quality to collect data to determine the project is truly in an attainment area. The referenced areas of Pahrump and

Responses to these comments are provided on a separate page following this comment document.

Comment No. 16-23 (continued)

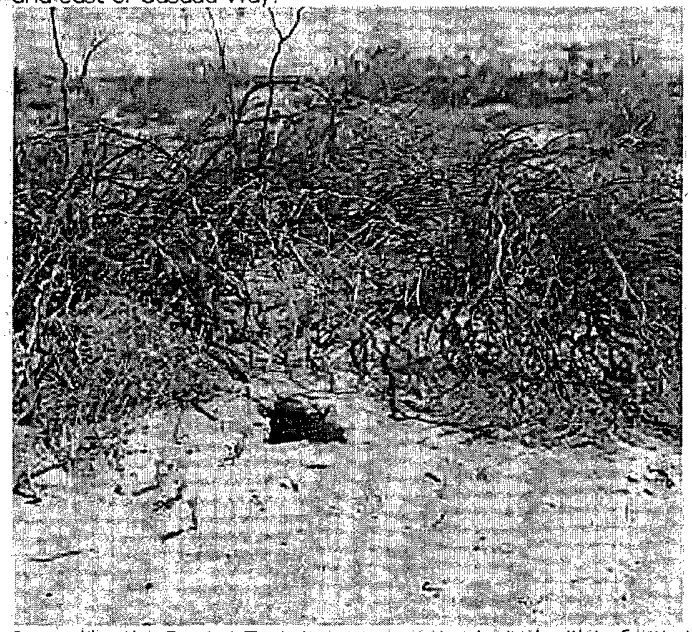
Yucca are insufficient to determine the air quality in Amargosa Valley.

Comment No. 16-24

Section 3.3.4 Prime and Unique Farmland has not been designated as prime farmland because no one as asked to the USDA to make the designation. The requested ROW could be developed into productive farmland in the same manor as the land to the south and east of the project.

Comment No. 16-25

Section 3.6.5.2 Federally Threatened, Endangered, Proposed, and Candidate Wildlife Species read like a textbook for a college class in pages 3-81 through 3-86 and the finally very little information about the project area. Just last week a tortoise burrow was photographed just north of Farm Road and east of Casada Way.



Seem like the Desert Tortoise surveys conducted within footprint of the proposed project from late March through May, 2009 missed this burrow or the tortoise moved in after the survey so that it could harvest the alfalfa from the center pivot south of Farm Road and east of Casada Way with a yellow dot in the center in Figure 3-10.

Comment No. 16-26

Section 3.7 Historic and Cultural Resources, Subsection 3.7.2 Affected Environment, page 3-99, "The cultural resource inventory for the current Project area resulted in the recordation of thirteen new prehistoric and historic sites. Of the thirteen sites, only one prehistoric site has been determined eligible for listing on the National Register of Historic Places

Responses to these comments are provided on a separate page following this comment document.

Comment No. 16-26 (continued)

under criterion 'd'. This site has the potential to be adversely affected by construction of this Project. Mitigation through a formal archaeological Treatment Plan involving data recovery would need to occur prior to any proposed ground disturbance."

1. How can the general public find criterion 'd' to review?
2. Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires Federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. The historic preservation review process mandated by Section 106 is outlined in regulations issued by ACHP. Revised regulations, "Protection of Historic Properties" (36 CFR Part 800), became effective January 11, 2001,
3. Memorandum of Agreement (MOA), which outlines agreed-upon measures that the agency will take to avoid, minimize, or mitigate the adverse effects.
4. Public involvement is a key ingredient in successful Section 106 consultation, and the views of the public should be solicited and considered throughout the process. The view of the public have not been solicited before the MOA was mitigate the under criterion 'd'.
5. The MOA had not been submitted to the Nevada Historic Preservation Office as of this date.
6. The MOA should be attached to the BLM's Final Record of Decision for this Project.

A responses to this comment is provided on a separate page following this comment document.

Respectfully submitted,

John F. Bosta

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RESPONSES TO COMMENT NO. 16-01 THROUGH 16-31

Response to Comment No. 16-01

As of December 2009, the proposed Project was one of 31 renewable energy project that have met the required milestones to remain on BLM's fast-track list for expediting processing (BLM 2009a). These projects are advanced enough in the environmental review and permitting process that they could potentially be cleared for approval by December 2010, thus making them eligible for funding under Section 1603 of ARRA. However, the Project schedule has changed and it is no longer eligible for Section 1603 cash grants. The Project is now classified only under Section 1703. The guidelines for meeting Section 1703's requirements, including the requirement to commence construction on or before September 30, 2011 have not changed. While ARRA does provide other types of funding for eligible projects, the proposed Project seeks funding pursuant to Section 1703. The Project is eligible for funding under the DOE's Federal Loan Guarantee program.

Being a part of the fast-track environmental review and permitting process does not involve or result in less than full compliance with applicable laws, including the National Environmental Policy Act. To the contrary, the fast-track process fully complies with all applicable requirements; the difference is that more resources are devoted to that process to allow for review to be conducted and decisions to be made on a faster timeline.

Response to Comment No. 16-02

See response to Comment No. 16-01.

Response to Comment No. 16-03

Construction of the proposed project has not begun. Construction cannot commence until the BLM grants a right-of-way and issues a Notice to Proceed. Activities listed by the commenter are separate actions required to obtain the necessary permits and approvals from other federal, state, and local agencies.

Response to Comment No. 16-04

See response to Comment No. 16-01.

Response to Comment No. 16-05

Solar Millennium right-of-way application and Plan of Development considered both a dry- and wet-cooled solar thermal power plant. As the lead federal agency, BLM analyzed both alternatives regardless of Solar Millennium's final decision to select the dry-cooled alternative.

Although the wet-cooled alternative would require much more water, it would improve performance during high ambient temperatures as compared to the dry-cooled alternative. The wet- and dry-cooled alternatives would have materially different effects for various resources. Revealing such different effects is one purpose of an alternatives analysis under NEPA, and the alternatives considered in the Final EIS effectively serve that purpose.

See also the response to Comment No. 19-03.

Response to Comment No. 16-06

This EIS does not tier to the Nye County Comprehensive Plan or other agencies plans. The reference to the Nye County Comprehensive Plan serves to inform the reader that other plans guide development activities in the area.

The six bullet points cited under section ES-1.4.4 is a direct quote from Title 40 CFR Section 1502.14 which list criterion for analyzing alternatives to be carried forward in an EIS. Section ES-1.4.4.1 (Alternative Sites) and ES-1.4.4.2 (Alternative Solar Technology), describes alternatives analyzed but eliminated from further analysis since they failed to meet the project purpose and need.

Response to Comment No. 16-07

The proposed project is located on federal lands managed by the BLM, which are subject to land management regulations set forth under the Federal Land Policy and Management Act (FLPMA). The Amargosa Valley Area Plan is a local land planning guide for development in the Amargosa Valley planning area. While the BLM considers the recommendations of the Amargosa Valley Area, the BLM must comply with its requirements under FLPMA.

Response to Comment No. 16-08

The proposed project is located on federal lands managed by the BLM, which are subject to land management regulations set forth under the Federal Land Policy and Management Act (FLPMA). The Amargosa Valley Area Plan is a local land planning guide for

development in the Amargosa Valley planning area. While the BLM considers the recommendations of the Amargosa Valley Area, the BLM must comply with its requirements under FLPMA.

Solar Millennium intends to upgrade an existing road off of Valley View for use as the primary access route to the project site. The road upgrade will be subject to additional permits and approvals (e.g. BLM, NDEP, and Nye County). Per the Nye County Development Agreement, prior to commencement of construction, Solar Millennium is required to prepare and submit a Master Traffic Impact Analysis for review and approval by Nye County. The Analysis shall address the impacts, if any, of the transportation of employees to and from the proposed project site. Solar Millennium shall provide the improvements required in the approved Master Traffic Impact Analysis in order to mitigate any land use impacts of the proposed Project. (See Section 6.6 of the Development Agreement in Appendix F).

Response to Comment No. 16-09

See response to Comment No. 16-08.

Response to Comment No. 16-10

See response to Comment No. 16-07.

Response to Comment No. 16-11

See response to Comment No. 16-08. Information about road upgrades and easements has been added to section 2.3.11 (Roads, Fencing, and Security) in the Final EIS. Agreements between Nye County and Solar Millennium regarding road upgrades is described in Section 6.6 in the Development Agreement provided in Appendix F.

Response to Comment No. 16-12

Flood control conveyance facilities proposed by the project will be designed to resist erosion and scour potential generated by 100-year event storm flows. Structural energy dissipating and spreading facilities will be provided at the discharge end of conveyance facilities to reduce storm flow velocities and shear stresses to non-erosive levels.

1. A conceptual level of evaluation is what is required by BLM at this stage of planning.

2. Available data relevant to flood control was obtained, reviewed and considered in the development of the Conceptual Stormwater Control Plan.

3. An adopted document containing detailed hydrologic and hydraulic design methodologies does not exist for Nye County (outside of the Pahrump Planning District). Per discussion with Nye County Department of Planning staff and the Nye County Floodplain Manager/Administrator, methodologies contained in the CCRFCD Hydrologic and Drainage Design Manual can and should be utilized to the extent where no specific Nye County criteria exists.

4. An adopted document containing detailed hydrologic and hydraulic design methodologies does not exist for Nye County (outside of the Pahrump Planning District). Per discussion with Nye County Department of Planning staff and the Nye County Floodplain Manager/Administrator, methodologies contained in the CCRFCD Hydrologic and Drainage Design Manual can and should be utilized to the extent where no specific Nye County criteria exists.

5. An adopted document containing detailed hydrologic and hydraulic design methodologies does not exist for Nye County (outside of the Pahrump Planning District). Per discussion with Nye County Department of Planning staff and the Nye County Floodplain Manager/Administrator, methodologies contained in the CCRFCD Hydrologic and Drainage Design Manual can and should be utilized to the extent where no specific Nye County criteria exists.

Response to Comment No. 16-13

The EIS is consistent with NEPA requirements. The EIS fully evaluates relevant data and provides a reasoned analysis of the proposed Project's potential effects on those data. The level of information and analysis reasonably represents baseline conditions in the region of influence.

Response to Comment No. 16-14

An adopted document containing detailed hydrologic and hydraulic design methodologies does not exist for Nye County (outside of the Pahrump Planning District). Per discussion with Nye County Department of Planning staff and the Nye County Floodplain Manager/Administrator, methodologies contained in the CCRFCD Hydrologic and Drainage Design Manual can and should be utilized to the extent where no specific Nye County criteria exists.

Response to Comment No. 16-15

See Response to Comment No. 16-14.

Response to Comment No. 16-16

Solar Millennium does not conduct NEPA site specific or cumulative impact determinations; that task falls on BLM, as the federal action agency under NEPA. As the lead federal agency, the BLM and its EIS Contractor used the best available information for analysis in this EIS. BLM specifically considered the referenced guidelines and local land use guidelines in evaluating the proposed Project's effects.

Response to Comment No. 16-17

An expanded discussion regarding cumulative flood impact of the other proposed solar projects north of the Solar Millennium project has been added to Section 4.17.7.4 in the Final EIS. However, it is important to note that each of the cumulative proposed projects will undergo its own review process, and will be required to comply with applicable regulatory requirements and to mitigate impacts that are identified in the review process.

Response to Comment No. 16-18

The Conceptual Stormwater Control Plan was developed in accordance with Nevada Drainage Law which overlaps policies of the FPP.

a. The proposed stormwater plan will not increase flooding of surrounding properties in that it proposes the stabilized release of intercepted storm flows to historic locations in both quantity and manner.

b. Solar Millennium has maintained discussions and presented the conceptual plan to the Nye County Floodplain Administrator. A submittal of a Technical Stormwater Control Plan will be submitted to the Nye County Planning Department for formal review and approval as the project moves forward with final design. Formal review by Nye County is not required at this level of the planning process.

c. The subject property is not located in FEMA designated floodzone. The proposed stormwater plan will not increase flooding of surrounding properties in that it proposes the stabilized release of intercepted storm flows to historic locations in both quantity and manner.

Response to Comment No. 16-19

Comment noted. Until a Record of Decision is issued for the updated Las Vegas RMP/EIS, the 1998 Las Vegas RMP/EIS is the regulatory document that guides land management activities in the Southern Nevada District.

Response to Comment No. 16-20

This issue is outside the scope of this EIS.

Response to Comment No. 16-21

The Draft EIS was issued on March 19, 2010. Interagency meetings among the Proponent, BLM, and Cooperating agencies are integral in developing appropriate mitigation measures to address each agency's resource concerns (e.g. National Park Service, U.S. Fish and Wildlife, etc.). Consistent with NEPA, BLM held public scoping meetings on the proposed Project and published the DEIS on its website and a Notice of Availability for the DEIS in the Federal Register. Information about public consultation and coordination is provided in Chapter 5 in the Final EIS. The BLM welcomes comments or inquiries from the public as it completes its review of the proposed Project.

Response to Comment No. 16-22

Additional language has been added to the Final EIS to clarify that the MOU is for Pahrump Valley only and not for all of Nye County.

Response to Comment No. 16-23

As stated in the Draft EIS "For regulatory purposes, the EPA considers unclassifiable areas to be in attainment. The Project area is located in an unclassifiable area." Pg 3-2 describes the ROI for air quality. It is outside the analysis of this EIS to determine if the EPA has correctly determined the status of the project area. The term "unclassified" does not have the meaning that the air quality of the area is unknown. The request for additional data gathering and analysis should be directed to the EPA.

Response to Comment No. 16-24

Prime and Unique farmlands is a designation set forth by the USDA. There are no prime and unique farmlands in the area.

Response to Comment No. 16-25

The BLM does not require surveyors to survey only in optimal years and does not hold the project proponent accountable for the change in weather in one year versus the next. As stated in Appendix A.6 mitigation measures WL-6, surveys will be conducted for Desert Tortoise in accordance with all State and Federal regulations. In addition, as stated in Appendix A.6, biological monitors will

be on site to ensure that no tortoises are harmed during the construction process, and clearance surveys will be conducted prior to any ground disturbance by construction.

Response to Comment No. 16-26

Criterion 'd' is defined in 36 CFR Part 60.4 as a property "that ha[s] yielded or may be likely to yield, information important in prehistory or history."

Response to Comment No. 16-27

As the BLM and Nevada SHPO agree on how the adverse effects will be resolved, a memorandum of agreement has been executed with concurrence of three local Tribes. Since there are no controversial issues present in the Historic Property Treatment Plan, a copy of it and the signed MOA will be sent to the ACHP. ACHP was notified of the project and the MOA.

Response to Comment No. 16-28

A MOA has been executed with the Nevada State Historic Preservation Office addressing the treatment of the historic property that will be adversely affected.

Response to Comment No. 16-29

Chapter 5 of the Draft EIS outlined the public involvement process that was followed for NEPA, and 36 CFR Part 800 Subpart A allows the use of these procedures for sections 106 compliance. BLM received no requests by any party to participate in the development of the MOA.

Response to Comment No. 16-30

A MOA has been executed with the Nevada State Historic Preservation Office addressing the treatment of the historic property that will be adversely affected prior to the signing of the ROD.

Response to Comment No. 16-31

The MOA will be included with the BLM's Final Record of Decision for the proposed Project if it is approved.

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Mr Greg Helseth,
Renewable Energy Project Manager,
Bureau of Land Management,
4701 N. Torrey Pines Dr.,
Las Vegas, NV 89130
702-515-5173

Dear Mr Helseth,

Comments on Draft Environmental Impact Statement
For Amargosa Farm Rd Solar Energy Project
(To be built by Solar Millenium)

As you know there are two alternative designs for the condensation of the exhaust steam from the turbines: dry and wet designs.

1. The wet design uses about 10 TIMES the water of the dry design. The wet design would use an additional 4200 acre feet a year(afy) of water, Executive Summary(ES) page 16 . Dry and wet designs would both need about 400 afy for mirror cleaning.
(For readers unfamiliar with this project or my comments presented at public meetings. The dry design condenses steam from the turbines in tubes cooled externally by air. The wet design condenses steam in tubes cooled by cold water from a cooling tower).

Comment No. 17-01

Now, reading the Executive Summary(ES) of the Bureau of Land Management's(BLM) Environmental Impact Statement(EIS), at ES 1.4.5, page ES-14, it states that 'The BLM is awaiting public input before identifying a preferred alternative'(emphasis added).

However, it seems that proposal by Solar Millenium(SM) is for the dry cooling design. The EIS states so, first paragraph of the ES. It is also stated at ES 1.4.4.2 , 'The Proponent(SM) has requested a right of way to construct and operate a dry-cooled, solar thermal parabolic trough project'. This is further stated at the beginning of Chapter 2, in the introduction, and also at other places.

The dry design being Solar Millenium's proposal, I conclude that SM has recognized that the Amargosa basin is overdrawn, so far as its water supply is concerned, and has considered the problem of disposal of cooling tower effluent, see below.

A response to this comment is provided on a separate page following this comment document.

Comment No. 17-01 (continued)

But the BLM is awaiting 'public input' before identifying a preferred alternative'. Why?

Comment No. 17-02

2. Let me summarize the water and effluent problems of the wet design of solar plant. The EIS seems to have omitted some facts and included factual inaccuracies.

2.1 The Amargosa Valley's water reservoir is being drawn down. More water is leaving the valley than the water recharge rate.

The State of Nevada's Div. of Water Resources(NDWR) reported in 2008, (the last ground water inventory posted on www.water.nv.gov), that about 18,000 af were pumped. In the BLM EIS report, table 3-7, at page 3-39, it is reported that over 25,000 af of water were pumped in 2009, there being an increase of about 8000 af over 2008 for irrigation. I suppose those extra 7000 head of cattle have to be fed and watered. But, continuing, there are close to 17,000 afy leaving from the springs in the Ash Meadows Wildlife Preserve (from data provided by the manager of the Wildlife Preserve in August 2009, which I think are very carefully recorded. I note this is very close to the value measured by Walker and Eakin in their survey of water resources of the Amargosa Valley, commissioned by the USGS in 1963). That is a total of 35,000 afy leaving the valley. Or over 42,000 afy if you take the data presented in the EIS.

The water recharge rate is accepted as 24,000 afy (from the Walker and Eakin report).

So, currently, the water reservoir in Amargosa Valley is being drawn down by about 18,000 afy, if you take the EIS data(or 11,000 afy if you take the NDWR pumping data for 2008).

This fact is also manifestly demonstrated by the fall in the water level in those wells monitored by the USGS(at nevada usgs.gov/water/). **The Amargosa observation well is dropping by 4.4 ft/yr.**

Incidentally, in the EIS, page 3-39 last paragraph, it is stated that 'groundwater withdrawal' for 1998 was 21,000 afy. The 1998 report by the NDWR, on the Amargosa ground water inventory, states that it was close to 15,000 afy. The EIS value appears to be in error. I also note that there appears to be no water pumping data between 2003 and 2009 in the EIS.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 17-02 (continued)

These data would be understood most easily in the form of a table. Perhaps you should also note the American Borate no longer takes any significant amount of non-irrigation water, since it is out of business.

Comment No. 17-03

2.2 Now, let's take a look at the wells identified as the source for 400 afy for the dry plant design. Wrt table 4-14, page 4-18 of the EIS, assuming the 'App No.' heading for column one is the well permit No. and looking at the actual field inventory reports you will find there are no meters for wells 15702, 15893, and well 43873's is broken. I assume the water usage has been estimated by the 'calibrated eyeball' looking at the area under cultivation. That being the case I don't think you can report groundwater withdrawal to 4 significant figures(1,328 afy). However, more importantly, I take these sections, 4.4 and 4.4.1 to again mean that you support the dry cooling option, since I find no discussion about providing for 4200 afy of water, except that it is assumed existing users could be persuaded to sell their current usage, ES-16.

Comment No. 17-04

One other comment, and this may be a bit picky, the accuracy of the results in the environmental effects tables, chapter 4, tables 4-1 to 4-13, seems to be too high. Take for example table 4-10, fugitive PM10s are given to 5 significant figures. A long time ago I learned that a calculated result is no more accurate than the least accurate piece of data that went into the calculation.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 17-05

2.3 Anyway, moving on the subject of cooling tower 'emissions'. In any process where steam is condensed with cooling tower water there will be, to a good approximation, an amount of water evaporated in the cooling tower equal to the amount of steam condensed. I assume that this plant would not convert more than 1/3 of the energy collected by the mirrors to electricity, meaning 2/3 would be rejected in the turbine exhaust and end up as cooling tower vapor. The water for this evaporation would have to come from the Amargosa underground reservoir.

The planned plant is 464MW. Therefore about twice this or about 930 MW would have to be rejected in the cooling towers. I calculate this to be equivalent to over an acre foot of water evaporation an hour. The plant will not be running at night, so the estimate of 4200 afy may be reasonable.
4200 afy would need to be evaporated.
All the dissolved solids from the evaporated cooling water would be discarded to the environment. Some would leave in the 'drift' water out of

Comment No. 17-05 (continued)

the top of the cooling tower. Most, however, would be discharged in the cooling tower blowdown. See Chemical Engineering Tools and Information(CET&I), website www.cheresources.com. You can find data on typical operating conditions for a cooling tower there.

Comment No. 17-06

In chapter 4 of the EIS, 'Environmental Effects', pages 4-12 and 4-13 it states that 100% of the total dissolved solids(TDS) would be PM10/PM2.5 emissions(?). Although it does mention that the blowdown would contain a maximum of 1,600 mg/L dissolved solids, there is no mention of flowrate.

We can calculate the total amount of solids which would be discarded from a wet design solar plant in a year. Looking at the Walker and Eakin report, table 9, the average TDS in Amargosa well water is about 400 ppm (ppm will be close to mg/L for dilute solutions in water).(I also note that the bicarbonate(HCO3) concentrations average over 200 ppm. This would mean the cycles of concentration have to be a lot less than the 15 assumed on page 4-12, see below.)

4200 afy would be evaporated in the cooling towers, see above. This is about 1.4 billion gallons. At 8.3lb/gal this is 12 billion lb. **At 400 ppm there will be about 2,400 tons of solids to be disposed of each year! There is no mention of this in the EIS**

What about the volume of blowdown to be disposed of? A typical value for volume is about a quarter of the cooling tower evaporation, see CET&I. If that were so, and somebody correct me if I am wrong, we would have to evaporate about a 1000 afy in evaporation ponds. If you assume about 8 feet of evaporation a year in the Amargosa area you would need at least 125 acres of evaporation ponds.

None of this seems to have been considered for a wet design.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 17-07

Going back to the bicarbonate levels in the well water. CET&I suggest that sodium bicarbonate levels be kept below 200ppm in cooling tower water and blowdown. If that were a requirement then all the net tower feed, not including the recirculation flow, would be blowdown, a concentration cycle of one! Oh, the 15 cycles of concentration stated on page 4-12 would result in tower water of 6000 ppm TDS!

CONCLUSION

Comment No. 17-08

I think EPG and the BLM need to drop the idea of a wet solar plant design for two reasons, summarized below and explained in more detail above:

A. The Amargosa basin is overdrawn by at least 11,000 afy. It seems that we should reduce consumption by that amount before we consider new consumption points. Particularly since we do not know who would sell 4200 afy for this project, or how much they would cost.

B. The EIS has not considered the quantity of cooling tower blowdown to be discarded from the wet design solar plant, with its associated dissolved solids. Thumbnail calculations indicate it would be large, see above.

A response to this comment is provided on a separate page following this comment document.

F. George Tucker 4/29/10
PO Box 26.
Amargosa Valley, NV 89020
702-254-8466

File is: SolarplantcommentsApril2010

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RESPONSES TO COMMENT NO. 17-01 THROUGH 17-08

Response to Comment No. 17-01

The BLM's Preferred Alternative is the Proposed Action (dry-cooled alternative).

Response to Comment No. 17-02

The conflicting water use estimates are derived from two different sources (USGS [Moreo et al.] and NDWR). Section 3.4.4.4 has been updated to include a more detailed description of water use in the Amargosa Desert Hydrographic Basin, including pumping inventory from 1983 through 2009.

BLM's preferred alternative is the dry-cooled alternative.

Response to Comment No. 17-03

The BLM preferred alternative is the Proposed Action (dry-cooled alternative). Table 4-14 displays the full duty of each Project well that is associated with its respective water right. The duty amounts shown in the table are correct.

Response to Comment No. 17-04

The most recent version of AERMOD (Version 09292) was used. AERMOD is the model preferred by U.S. EPA and NDEP for the type of site, emission source, and regional terrain features of the Amargosa Farm Road facility and the Amargosa Valley region.

Also note that in the FEIS site specific air modeling was conducted and the figures have changed.

Response to Comment No. 17-05

Comment is unclear. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 17-06

As stated in the DEIS, the evaporation ponds for a wet-cooled design would utilize 46 acres of land. Some of the blowdown water would be used for dust suppression, and some would go into one of the two evaporation ponds.

Response to Comment No. 17-07

Cooling tower blowdown would contain a maximum of 1,600 mg/L TDS assuming 15 cycles of concentration for a wet-cooled project.

Response to Comment No. 17-08

The BLM's Preferred Alternative is the dry-cooled alternative. Regarding comment B - the amount of cooling tower blowdown to be discarded from a wet-cooled solar project is described in Section 2.4 in the FEIS.

Bureau of Land Management
07:30
APR 30 2010
LAS VEGAS
FIELD OFFICE
Las Vegas, Nevada

Comment No. 18-01

I have some comments regarding the proposed Solar Millennium Project here in Amargosa Valley, Nevada. There are basically two which I consider to be important enough to either cancel or modify the project as presented.

The first is the site location itself. It is right in the middle of Forty Mile Wash. This feature is clearly marked on USGS maps. It is significant enough that the Yucca Mountain Project investigated it, and considered it in their project even though they are west of the wash. The water comes from their site.

There was a very significant flood in 1995. I was here and I remember. Hwy. 95 was closed and traffic was routed through Amargosa Valley along Amargosa Farm Road. The NHP escorted groups of vehicles, and they went very slowly as Farm Road had water flowing across it in multiple locations. Apparently an even larger event occurred in 1969. I found a scientific account of more flooding in 1998 this by USGS online at:

http://pubs.usgs.gov/fs/fs-036-01/text/fs03601.htm

I will also enclose a copy of a report done by USGS, apparently for DOE, that concerns the 1995 event and makes mention of the 1969 event. It can be found here:

http://www.osti.gov/bridge/purl.cover.jsp;jsessionid=AE076C11582579B44F242221C1F0C21E?purl=/177392-AiHbsb/webviewable/

So it would seem there have been at least two major events in the last 41 years, and there are possibly several more that would have impacted the site in question. The notion that any of these is a "100 year event" seems rather farfetched as there have been at least two and possibly four or more in just 41 years. A true 100-year event probably has not occurred in recorded history, which is very brief here. There has been essentially nobody living here until the last 50 years. What might have transpired before then is unknown. No one knows what a 100-year event would look like, but it is coming. And the flood plain caused by Forty Mile Wash has not been studied in any detail so almost anything would be guesswork.

Response to Comment No. 18-01

The Project site is considered suitable for development of a solar power facility due to its solar radiation potential and flat terrain, despite the challenges posed by stormwater runoff potential. Impacts to and mitigation concerning Fortymile Wash are discussed at length in Chapter 3 and 4. The flood that occurred in 1969 generated 3,330 cfs of stormwater runoff measured at the gage station just upstream of US 95. The floods that occurred in 1995 and 1998 generated 1,200 cfs and 340 cfs measured at the same gage station. The Solar Millennium project site has been designed with perimeter flood control facilities to accommodate the 100-year storm event flow determined to be approximately 9,600 cfs.

Comment No. 18-02

The "Conceptual Storm Water Control Plan" in the EIS is just that. It addresses the expected rainfall on the site itself. It doesn't really consider a major flood in Forty Mile Wash, and certainly not a 100-year event. It has two plans to handle the situation. The first is the "let George do it" plan. It suggests that entities unknown, most likely the proposed solar site to the north, somehow prevent the flood waters from getting to the Solar Millennium site. I seriously doubt BLM or DOE is going to build another Hoover Dam on the north side of Hwy. 95 to intercept flash flood waters.

The second plan is to build diversion channels around the perimeter of the site to stop any flood waters. This is "... considered necessary to protect the site from offsite storm flows." That is the only reason given. Nothing about protecting anything that might be down stream from the site. There is mention of Nevada Drainage Law, which is supposed to absolve them of any responsibility. There is also mention of returning the flow to its normal channel on the other side of the site. The problem here is that we are not talking about a river, but a flood plain. Water is not normally found there, but when it is it is the result of a flash flood and the water follows no defined path, but, rather, flows in multiple washes, and no floods will be exactly the same. If you walk along T&T Road north from Amargosa Farm Road for a couple of miles you will cross several such washes. Some are small, and a few are quite large. There is another large wash about a mile to the west, and a few to the east. Where is all this flood water to go?

Response to Comment No. 18-02

The Conceptual Stormwater Control Plan provides analysis for the project site as well as the entire contributing basin of the Fortymile Wash (approximately 330 square miles) impacting the project site. Perimeter flood control facilities proposed for the project have been conceptually designed to intercept, convey and discharge the computed 100-year storm event flow rate of approximately 9,600 cfs generated by the Fortymile Wash watershed. The proposed stormwater plan will not increase flooding of surrounding properties in that it proposes the stabilized release of intercepted storm flows to historic locations in both quantity and manner.

Comment No. 18-03

To use the Nevada Drainage Law oft quoted in the plan, the current interpretation is that a landowner is responsible for damage to down stream property if the landowner has done anything to change the natural drainage on the property.

Negligence has been defined by Black's Law Dictionary as "the omission to do that which a reasonable man, guided by those ordinary considerations which ordinarily regulate human affairs, would do, or the doing of something which a reasonable and prudent man would not do."

Response to Comment No. 18-03

The proposed stormwater plan will not increase flooding of surrounding properties in that it propses the stabilized release of intercepted storm flows to historic locations in both quantity and manner.

Comment No. 18-03 (continued)	**Placing the negligence definition into an engineering context, the reasonable and prudent man standard becomes a reasonable professional and prudent professional standard. Thus, a professional engineer who fails to act within the standard of care of his engineering profession may be held liable for negligence. The applicable standard of care is established in court by expert testimony.** **Therefore, if they divert the flood waters coming from Forty Mile Wash, they are responsible for any resulting damage to property down stream.**	
Comment No. 18-04	**They may be required to post a bond to cover restoration costs at the completion of the project. It's unlikely that the land will be restored to anything like its original condition with respect to flood waters. Is there a bond to cover flood damage, either while the site is in operation, or after it is dismantled and is not done adequately?**	Response to Comment No. 18-04 A facility closure and decommissioning plan will be developed which describes closure requirements and the anticipated bond level nevessary to satisfy BLM requirements.
Comment No. 18-05	**The second comment is about moving Amargosa Farm Road. The people in Amargosa are widely scattered. There are only a few paved roads that are more than a few miles long. Mostly the roads are gravel or dirt. The only road that can be considered to be the main road in town is Amargosa Farm Road.** **I was Chairman of the Planning Board when the first Master Plan was assembled in 2000, and took part in the new version that was produced in 2009. It can be seen here:** **http://www.avnv.net/AreaPlan/** **It can be seen that the area south of Amargosa Farm Road where the road is to be moved is for low density housing. The area, as proposed for this project, will now look like some sort of prison with the high chain link and barbed wire fences and security lighting and trucks driving around at night to spray the collectors. Not to mention that the only major road in town would have a detour at that point.**	Response to Comment No. 18-05 The proposed project is located on federal lands managed by the BLM, which are subject to land management regulations set forth under the Federal Land Policy and Management Act (FLPMA). The Amargosa Valley Area Plan is a local land planning guide for development in the Amargosa Valley planning area. While the BLM considers the recommendations of the Amargosa Valley area, the BLM must comply with its requirements under FLPMA.

Comment No. 18-06

I have no objection to the actual facility as planned, only to its location. Forty Mile Wash in not a buildable site, to borrow real estate parlance. There is no practical way to divert a major flood coming down the wash. *I seriously doubt any insurance company would issue flood* insurance for such a project without charging prohibitive premiums. Several small washes cut across my property, one of which had water flowing in it during the 1995 flood. I have no intention of building anything in those areas and intend to leave them untouched as the day may come when they are once again small rivers for a day. As an engineer I would strongly suggest a similar policy for anyone contemplating building elsewhere in Forty Mile Wash.

Andrew Gudas - former Chairman, Amargosa Planning Board
P.O. Box 243
Amargosa Valley NV 89020

Response to Comment No. 18-06

The Conceptual Stormwater Control Plan included in this EIS was developed in accordance with Nevada Drainage Law which overlaps policies of the FPP.

The Conceptual Stormwater Plan will not increase flooding of surrounding properties because it will provide for the stabilized release of intercepted storm flows to historic locations in both quantity and manner. Solar Millennium has coordinated with, and presented the conceptual plan to, the Nye County Floodplain Administrator. A final Technical Stormwater Control Plan will be submitted to the Nye County Planning Department for formal review and approval once the Project's final design is approved. (The remaining details required for final design are engineering details not necessary for a full review of the Project's impacts under NEPA.) Formal review by Nye County is not required at this level of the planning process. The subject property is not located in FEMA designated floodzone.

DOE/NV/10874--T3

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Overview of Runoff of March 11, 1995, in Fortymile Wash and Amargosa River, Southern Nevada

U.S. Department of the Interior—U.S. Geological Survey

Yucca Mountain, approximately 120 miles northwest of Las Vegas, Nev., is being studied by the U.S. Department of Energy as a potential repository for long-term storage of the Nation's high-level nuclear waste. This site-characterization study includes elements pertaining to surface-water runoff, including the potential for flooding. The U.S. Geological Survey (USGS), in cooperation with the U.S. Department of Energy, is monitoring streamflow in southern Nevada through a network of streamflow gaging stations and miscellaneous streamflow measurements in support of the site-characterization effort.

Yucca Mountain and much of the western part of the Nevada Test Site (NTS) are part of the Amargosa River drainage. The Amargosa River is a major drainage component (over 5,000 mi^2) of the unique closed-basin, hydrologic regime known as the Great Basin. Fortymile Wash and Beatty Wash (fig. 2) are the major tributaries to the upper Amargosa River, which drains through several small, populated areas downstream. This river system terminates in Death Valley, a National monument with an expanding tourist population.

The rugged and sparsely vegetated Amargosa River drainage is within the rainshadow of the Sierra Nevada. As a result of dry, semi-arid, continental climate, flow of the Amargosa River is ephemeral except in a few relatively short reaches where discharging springs maintain small, perennial base flows. Prior to Yucca Mountain site-characterization studies, few data were available on the streamflow of the Amargosa River and its major tributaries. Flow characteristics of the basin are generally poorly understood.

Near U.S. Highway 95, the Fortymile Wash channel changes from being moderately confined to several distributary channels that are poorly confined. This poorly-defined, distributary-drainage pattern persists downstream to its confluence with the Amargosa River. Streamflow losses to infiltration and evaporation within this reach are high (Savard and Beck, 1995). The Amargosa River is likewise moderately confined upstream from the Big Dune (fig. 2). Downstream from the Big Dune, the river splits into several channels that are poorly defined through the Amargosa Valley farm area. These areally abrupt changes in flow-pattern and channel-geometry characteristics of Fortymile Wash and the Amargosa River, wherein moderately- to well-defined channels evolve downstream into poorly defined channels, cause uncertainty regarding flow continuity within and between the two drainages. Major questions throughout the Yucca Mountain site-characterization studies are whether, under the present climatic regime, Fortymile Wash is capable of flowing to the Amargosa River, and whether Amargosa River is similarly capable of flowing from its source to Death Valley.

The runoff of March 11, 1995, provided answers to these questions about flow continuity. Precipitation associated with a weather disturbance moving eastward from California caused the most extensive regional runoff in Fortymile Wash and Amargosa River (fig. 2) since February 1969. Preliminary data reported for selected USGS and NTS rain gages within the study area showed that cumulative precipitation ranged from about 2 to 6 inches during March 9-11, with the larger amounts falling at the higher-altitude sites. Eyewitness accounts of snowpack conditions on Timber Mountain and Pahute Mesa just before and after the storm indicate that, in addition to rainfall, high-altitude snowmelt probably contributed to the volume of runoff in Fortymile Wash and Beatty Wash.

The runoff of March 11 is important because it represents the first documented case during site-characterization studies in which Fortymile Wash and Amargosa River flowed

Figure 1. Evidence of debris-laden runoff of March 11, 1995, at Fortymile Wash near Amargosa Valley streamflow gaging station above U.S. Highway 95.

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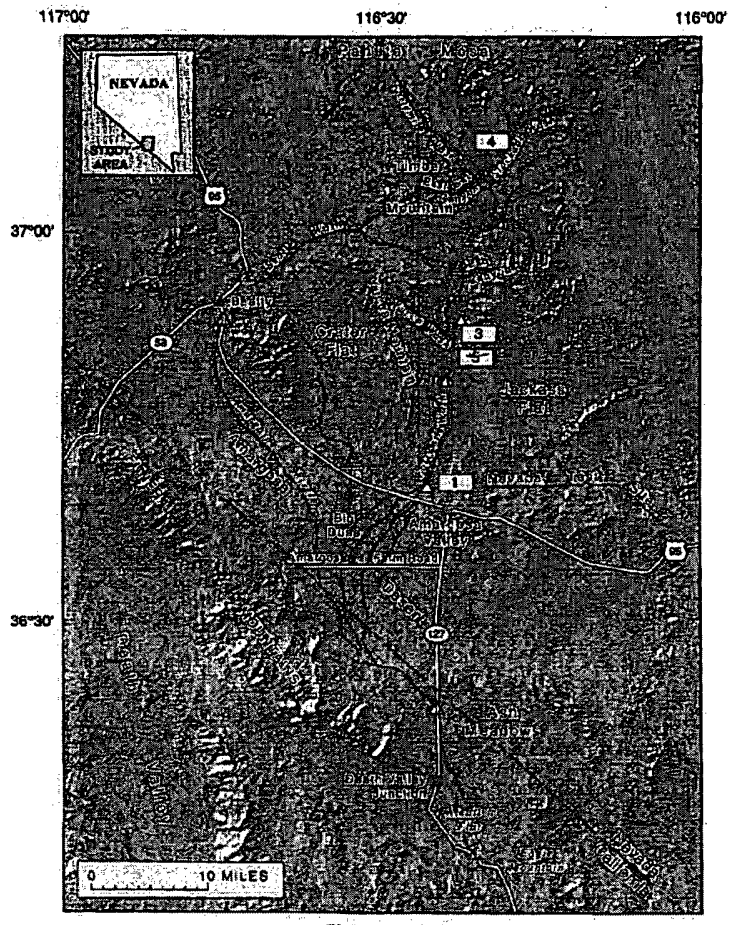
MASTER



EXPLANATION

△ Streamflow recording site

▲ Miscellaneous streamflow measurement site

—— Stream channel with flow on MARCH 11, 1995

1 Approximate location of photograph–Number corresponds to

Figure 2. Geographic setting and surface flow paths during the March 11, 1995, runoff in Fortymile Wash and Amargosa River.

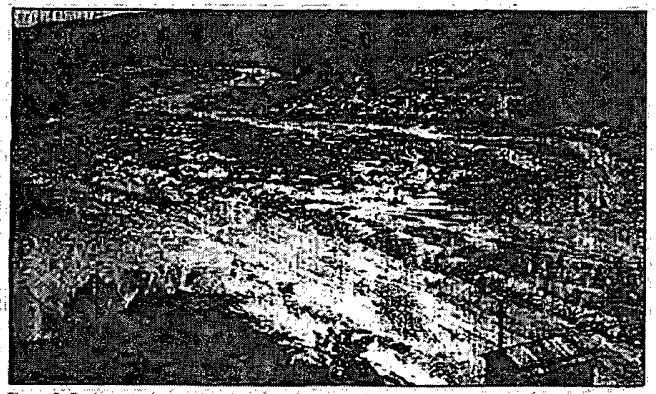


Figure 3. Bank erosion and sediment deposition in Fortymile Wash at Narrows as a result of runoff of March 11, 1995.

simultaneously throughout their entire Nevada reaches. These two fluvial systems were last reported to have flowed extensively within Nevada in February 1969 before site characterization started. The 1969 flood is overall the largest known in the Amargosa River system during the last 25 years. Flow in Fortymile Wash was first documented during site-characterization studies in March 1983, shortly before the initial streamflow gaging stations were installed. The Wash had flow again three times during July and August 1984 as the result of severe but localized convective storms. The extent of flows beyond the boundaries of NTS were not investigated for these early 1980's runoffs.

A field reconnaissance after the storm of March 1995 indicated moderate runoff throughout Fortymile Wash (figs. 1 and 2), several of its main tributaries (East Cat Canyon Wash, Stockade Wash, Pah Canyon Wash, and Yucca Wash), and several minor tributaries that drain the eastern flank of Yucca Mountain (fig. 2). The Amargosa River also flowed, from above Beatty past the California-Nevada state line, with a large percentage of the flow contributed by Beatty Wash (fig. 2).

The duration of flow in Fortymile Wash was approximately 10 to 12 hours. U.S. Highway 95 was closed from about 8:00 a.m. to about 5:30 p.m. on March 11 because of the streamflow (Trooper William Graham, Nevada Highway Patrol, oral communication, 1995). All evidence indicated heavy debris transport. Bank erosion and sediment deposition were observed along most of Fortymile Wash (fig. 3) within the NTS with sediment deposits as thick as 5 feet in some areas. Other effects of the Fortymile Wash runoff include damage to the Stockade Wash culverts at Airport Road on Pahute Mesa (fig. 4), sediment deposition on H Road where it crosses Fortymile Wash east of Yucca Mountain (fig. 5) and on Amargosa Farm Road in Amargosa Valley. A near tragedy occurred at the H-Road crossing when an NTS worker was swept away by an initial flow surge while attempting to cross Fortymile Wash during the early morning of March 11. His account of the event described the surge as a "5- to 6-foot wall of water and clattering rocks" followed by a rapidly rising water level that moved at high velocities (Augustine Passalacqua, TRW Environmental Safety Systems, Inc., oral communication, 1995).

Amargosa River runoff duration was also approximately 10 to 12 hours. Minor bank erosion and sediment deposition were observed along the Amargosa River from Beatty to Amargosa Valley. Amargosa Farm Road acquired additional sediment deposits as a result of the Amargosa River flow.

Peak flow in Fortymile Wash was significantly attenuated when the flow split into several distributary channels near U.S. Highway 95. Peak flow was attenuated further when a part of the distributed flow was diverted to the west for about 6 miles along the north shoulder of U.S. Highway 95 before turning southward again. The Amargosa River peak flow attenuated between Beatty and Big Dune. Downstream from Big Dune, the flow turned southward and split into several shallow distributary channels through the Amargosa Valley farm area.

Peak flows for Fortymile Wash and Amargosa River were again attenuated at the confluence of the two streams near the southeast end of the Funeral Mountains. Flow within this broad, flat confluence area was slow and shallow (only inches deep) owing to the absence of well-defined channels and the low land-surface gradient. The merged flow of Fortymile Wash and Amargosa River converged into a shallowly incised, well-vegetated channel just upstream of California Highway 127 and flowed into the broad Alkali Flat near Death Valley Junction. The combined Fortymile Wash and Amargosa River runoff flowed through Alkali Flat where it combined with other runoff to the Amargosa River caused by localized precipitation near Eagle Mountain.

The information provided by the USGS surface-water monitoring program documented flow from the headwater areas of Fortymile and Beatty Washes, and the combined flow downstream past Death Valley Junction that resulted from moderate runoff. This documentation confirms that Fortymile Wash and Amargosa River have the potential, in the present climatic regime, to transport dissolved and particulate material beyond the confines of NTS and the Yucca Mountain areas during moderate and more severe streamflow.

—David A. Beck and Patrick A. Glancy

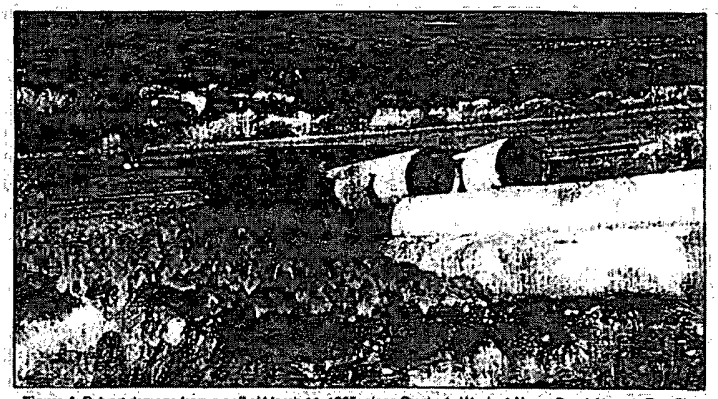


Figure 4. Culvert damage from runoff of March 11, 1995, along Stockade Wash at Airport Road, Nevada Test Site.

Figure 5. I-Road Crossing Fortymile Wash, Nevada Test Site. Debris from runoff of March 11, 1995, was bulldozed to both shoulders of the road. Site is where NTS worker was swept downstream.

Selected References

Kane, T.G., Bauer, D.J., and Martinez, C.M., 1994, Streamflow and selected precipitation data for Yucca Mountain region, southern Nevada and eastern California, water years 1986-90: U.S. Geological Survey Open-File Report 94-312, 118 p.

Pabst, M.E., Beck, D.A., Glancy, P.A., and Johnson, J.A., 1993, Streamflow and selected precipitation data for Yucca Mountain and vicinity, Nye County, Nevada, water years 1983-85: U.S. Geological Survey Open-File Report 93-438, 66 p.

Savard, C.S., and Beck, D.A., 1994, Transmission losses in Fortymile Wash near Yucca Mountain, Nevada [abs.]: Eos, American Geophysical Union Transaction, v. 75, no. 44, p. 283

U.S. Geological Survey, 1994-95, Water resources data, Nevada, water years 1993-94: U.S. Geological Survey Water-Data Reports NV-93-1 to NV-94-1 (published annually).

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Fact Sheet 036-01

Flooding in the Amargosa River Drainage Basin, February 23-24, 1998, Southern Nevada and Eastern California, including the Nevada Test Site

Introduction

The Amargosa River drainage basin is about 100 miles northwest of Las Vegas, Nev., and includes part of the Nevada Test Site (NTS). During February 23-24, 1998, a regional storm produced 1.10-2.81 inches of measured precipitation, which resulted in minor flooding throughout the Amargosa River drainage basin. Streamflow from this storm was largely derived from four tributaries: Topopah, Fortymile, and Beatty Washes, which originate on NTS, and Carson Slough, which drains the Ash Meadows area downstream from NTS (Fig. 1). Streamflow from these tributaries caused the Amargosa River to flow continuously from its headwaters or Pahute Mesa to its terminus in Death Valley (Fig. 1).

U.S. Geological Survey (USGS) personnel estimated peak streamflows at more than 30 locations and compiled precipitation measurements within the Amargosa River drainage basin to characterize the February 23-24, 1998, flooding (Tables 1 and 2). The data collected are compared with similar data from the March 10-11, 1995, flooding of the Amargosa River. Cumulative streamflow volumes for the 1995 and 1998 storm runoffs cannot be compared because most of the streamflow gaging stations operated in 1995 were discontinued prior to the 1998 flood.

The USGS, in cooperation with the U.S. Department of Energy, monitors streamflow in southern Nevada and eastern California through a network of streamflow gaging stations and streamflow measurements at miscellaneous sites. Data provided by this network are being used to help with the characterization of Yucca Mountain, near NTS, as a potential repository for long-term storage of the Nation's high-level nuclear waste. Major questions arising from the Yucca Mountain site-characterization studies are whether, under the present climatic regime, Fortymile Wash is capable of flowing to the Amargosa River, and whether Amargosa River is similarly capable of flowing from its source to Death Valley.

The Amargosa River Basin includes 5,500 mi^2 (Grasso, 1996, table 1) of rugged arid terrain in southwestern Nevada and southeastern California (Fig. 1). Basin relief is approximately 8,000 feet, ranging from about 7,700 feet above sea level at Pahute Mesa, Nev., to about 300 feet below sea level at Badwater Basin in Death Valley, Calif. The river basin is sparsely populated and includes small rural communities, mining operations, agricultural areas, Ash Meadows National Wildlife Refuge, Death Valley National Park, and government research facilities at NTS.

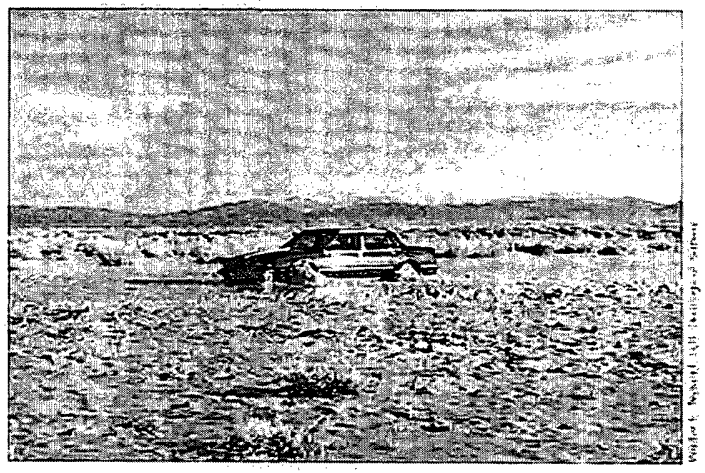
The Amargosa River is atypical of most North American rivers because it seldom flows; runoff is infrequent because much of the basin receives less than 6 in/yr of precipitation (Hardman, 1965). The river is normally dry except for several short reaches that flow seasonally and are fed by springs. The major tributaries to the northern reach of the Amargosa River are Thirsty Canyon wash and Beatty Wash, which drain the northwestern part of NTS (Fig. 1). Major tributaries to the central reach of the Amargosa River are Fortymile Wash, Topopah Wash, and

Carson Slough (Fig. 1). Fortymile Wash drains the southern part of Pahute Mesa, the western part of Jackass Flats, and the eastern slopes of Yucca Mountain. Topopah Wash drains the eastern part of Jackass Flats. Carson Slough, near Death Valley Junction, is a network of shallow incised channels that drain the Ash Meadows area.

Downstream from Alkali Flat, in the southern reach, the Amargosa River channel generally is well defined from Eagle Mountain to Dumont Sand Dunes, Calif. Upstream from Dumont Sand Dunes, small thermal springs near Shoshone and Tecopa, Calif., contribute flow to the Amargosa River. Springs also add to river flow in the canyon reach between Tecopa and Dumont Sand Dunes. Downstream from Dumont Sand Dunes, the Amargosa River flows through southern Death Valley to its terminus at the Badwater Basin salt pan.

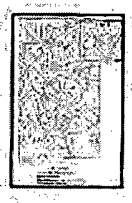
February 1998 Storm and Streamflow

Precipitation monitoring sites operated by the National Weather Service (NWS), U.S. Fish and Wildlife Service, and National Oceanic Atmospheric Administration (NOAA) recorded 29 to 54 percent of total February precipitation from a regional storm system within 48 hours beginning the morning of February 23, 1998 (Table 1). USGS personnel at NTS reported streamflow in small washes, such as Split and Pagany (which partly drain the eastern slope of Yucca Mountain), during the morning of February 23 (Fig. 1). By mid-afternoon, Yucca, Topopah, and Fortymile Washes also were reported flowing. Fortymile Wash was flowing over roads on NTS near Yucca Mountain (Daniel Soeder, U.S. Geological Survey, written commun., 1998). Peak streamflow estimates for Fortymile and Topopah Washes (Table 2) and downstream field observations indicate those streams flowed from NTS and joined the Amargosa River. On the basis of field observations and data collected from continuous surface-water monitoring sites, streamflow durations generally ranged from 12 to 36 hours and varied according to tributary subbasin sizes. Channel erosion by streamflow was considered minimal in the large tributaries of Fortymile, Topopah, and Beatty Washes, but was more severe in some smaller tributaries such as Pagany, Yucca, Split, and Dune Washes. Roads within these small drainages were nearly impassable because of erosion.



Carson Slough, State Line Road near Death Valley Junction, California, looking north, February 25, 1998.

Figure 1. Geographic setting and flow paths of the Amargosa River drainage basin during the February 23-24, 1998, flood.



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Field observations off NTS indicated that Amargosa River flow lasted for several days near Eagle Mountain and southward near Dumont Sand Dunes (Fig. 1). Although not quantifiable because of multiple, poorly confined channels, field observations indicated that runoff from the Ash Meadows area contributed substantial streamflow (through Carson Slough) to the central reach of the Amargosa River. Prolonged runoff from Ash Meadows probably was amplified because precipitation prior to late February recharged the soil mantle.

Thereby, infiltration losses from the late-February storm were reduced. Flows over roads were observed where U.S. Highway 95 crosses Fortymile Wash, in the Amargosa Farms, State Line Road area, and at several river crossings on California State Highway 127. The combined result of widespread and prolonged storm runoff throughout the Amargosa River Basin was persistent streamflow that contributed to the formation of a small lake on the normally dry and barren Badwater Basin salt pan at the river terminus in Death Valley.

Table 1. Precipitation for March 1995 and February 1998 floods, Amargosa River Basin, Nevada-California

[Abbreviations and symbol: e, estimated; Nev., Nevada; NTS, Nevada Test Site; --, not available. Note: Trace amounts of precipitation and snowfall are not figured into totals.]

Site identifier (Fig. 1)	Station name	Precipitation (inches) in March 1995		Percent of total for March 10-11, 1995	Precipitation (inches) in February 1998		Percent of total for February 23-24, 1998
		March 10-11	March total		February 23-24	February total	
A	Beatty, Nev.[1,4]	2.36	3.50	67	1.68	4.47	38
B	Fortymile Canyon, NTS[2]	3.98	5.40	74	2.10	5.15	41
C	Cane Springs, NTS[2]	1.38	2.63	52	e2.20	e6.04	36
D	Jackass Flats, NTS[2]	1.79	2.48	72	e2.10	e6.26	34
E	Rock Valley, NTS[2]	1.53	2.61	59	2.81	5.97	47
F	Mercury, NTS[2]	.68	1.60	42	2.17	4.10	53
G	Desert Rock, NTS[2]	.81	2.39	34	2.52	4.64	54
H	Amargosa Farms, Nev.[1,4]	.52	.94	55	1.76	3.69	48

I	Ash Meadows, Nev.[3]	--	--	--	1.40	3.16	44
J	Pahrump, Nev.[1]	--	--	--	1.42	3.32	43
K	Shoshone, Calif.[1,4]	0	.45	0	1.10	3.84	29
L	Death Valley, Calif.[1,4]	.24	.31	77	1.10	2.31	48

[1] Ernie Cobb, National Weather Service, written commun., 1998.

[2] Raymond D. Dennis, National Oceanic Atmospheric Administration, written commun., 1998.

[3] David St. George, U.S. Fish and Wildlife Service, oral commun., 1998.

[4] Dorothy Miller, Desert Research Institute, oral commun., 1998.

Comparison of 1995 and 1998 Floods

The floods of March 1995 and February 1998 have similarities and differences. Similarities include larger-than-normal snowpacks during both years on Pahute Mesa and surrounding mountains (Beck and Glancy, 1995; Raymond Dennis, National Oceanic and Atmospheric Administration, oral commun., 1998). Both floods were the result of regional storms that contributed a substantial quantity of precipitation to the river basin over a relatively short time. Also, both floods may have occurred during periods of the atmospheric and oceanic phenomenon known as "El Nino" (Desert Research Institute, 1998; National Oceanic and Atmospheric Administration, 1998). During both floods, surface water from NTS flowed to the Amargosa River mainly by way of Fortymile Wash, and road overflows were observed at similar locations. Neither lower Crater Flat nor Solitario Canyon (Fig. 1) contributed streamflow to the Amargosa River during the floods of March 1995 and February 1998.

Differences between the two floods, however, also were apparent. For example, the flood of March 1995 was the result of precipitation, of relatively short duration, that occurred mainly in the higher altitudes near Yucca Mountain. Snowpack melting, which resulted from precipitation at these higher altitudes, probably contributed significantly to the peak streamflows in Beatty and Fortymile Washes and their associated tributaries (David A. Beck, U.S. Geological Survey, oral commun., 1998). In Fortymile Wash, a peak streamflow of about 3,000 ft^3/s (Table 2) severely scoured and eroded the channel and caused extensive road damage on NTS and to U.S. Highway 95 (Beck and Glancy, 1995).

In contrast, the February 1998 flooding was attributed to persistent, widespread precipitation, over several days, which eventually caused streamflow in most major tributaries to Fortymile Wash and the Amargosa River. Although snowpack accumulation was observed at higher altitudes within the region during February 1998, snowpack melting was not a major factor during the 1998 flood (David A. Beck, U.S. Geological Survey, oral commun., 1998). Peak streamflows generally were lower in the northern (higher altitude) reach of the Amargosa River drainage basin, but higher in the central and southern (lower altitude) reaches of the drainage basin.

Major streamflow from NTS during the March 1995 flood was observed only in Beatty and Fortymile Washes. During the February 1998 flood, Topopah Wash also flowed off NTS (Table 2). Based on peak-flow estimates and observations of channel scour and fill, streamflows were greater in Beatty and Fortymile Washes during March 1995 than February 1998; however, streamflows were greater in several small washes including Dune, Yucca, Cane Springs, and Split (Table 2) during February 1998 than March 1995. Durations of streamflows also differed between the two floods; the February 1998 streamflows in washes on NTS lasted 12 to 36 hours, whereas the March 1995 streamflows lasted only 10 to 12 hours.

Runoff from the Ash Meadows area played an important role in sustaining streamflow in the

central and southern reaches of the Amargosa River in February 1998. Near-peak streamflow discharge was observed at Carson Slough draining into Alkali Flat approximately 24 hours after flow completely ceased in Fortymile Wash and in the Amargosa River upstream from Nevada State Highway 373 (David A. Beck, U.S. Geological Survey, oral commun., 1998). Overall, the February 1998 flood sustained streamflow over a longer duration throughout the entire Amargosa River drainage basin than did the March 1995 flood.

Summary

The 1995 streamflow was dominated by high-magnitude runoff of relatively short duration in Beatty and Fortymile Washes, probably enhanced by localized precipitation on snowpack in the upper altitudes of NTS. In 1998, sustained regional precipitation caused lower magnitude streamflows of longer duration in Fortymile Wash, Amargosa River, and their major tributaries. In both floods, much or all of Fortymile Wash and the Amargosa River flowed simultaneously. In March 1995, water in Fortymile and Beatty Washes flowed off NTS; in February 1998, water in Topopah Wash also flowed off NTS. In 1995 and 1998, the Amargosa River flowed from its headwaters to its terminus in Death Valley. Both the 1995 and 1998 floods indicate, therefore, that the Amargosa River, with contributing streamflow from one or more among Beatty, Fortymile, and Topopah Washes, has the potential to transport dissolved and particulate material well beyond the boundary of NTS and the Yucca Mountain area during periods of moderate to severe streamflow.

Table 2. Peak-flow estimates for selected sites in tributaries and reaches of the Amargosa River Basin, Nevada-California

[Site number is assigned in downstream order from uppermost location. Abbreviations and symbols: Nev., Nevada; Calif., California; nd, not determined; ft^3/s, cubic feet per second; mi^2, square miles; <, less than]

Site no. (Fig. 1)	Gaging station		Drainage area (mi^2)	Peak discharge (ft^3/s)		Years of streamflow record
	Number	Name		March 1995	February 1998	
		Nevada Test Site				
6	102512495	Pah Canyon Wash above Fortymile Wash Confluence	6.28	nd	90	1998
7	102512496	Unnamed Tributary to Fortymile Wash North of Delirium Canyon	1.14	nd	180	1998
8	102512497	Delirium Canyon Wash above Fortymile Wash Confluence	2.37	nd	120	1998
9	102512499	Unnamed Tributary to Fortymile Wash South of Delirium Canyon	.81	nd	70	1998
10	10251250	Fortymile Wash at Narrows	258	3,000	200	1983-97, 1998
11	10251252	Yucca Wash near Mouth	17	0	220	1982-95, 1998
12	102512531	Pagany Wash near the Prow	.47	60	20	1994-95, 1998
13	102512533	Pagany Wash #1 near Well UZ-4	.82	60	17	1993-95, 1998
14	102512535	Drillhole Wash above UZ-1	.68	30	< 4.0	1994-95, 1998
15	1025125356	Wren Wash at Yucca Mountain	.23	30	< 5.0	1994-95, 1998
16	102512537	Split Wash below Quac Canyon Wash	.33	11	13	1993-95, 1998
17	1025125372	Split Wash at Antler Ridge	2.35	nd	< 2.0	1993-95, 1998
18	10251254	Drillhole Wash at Mouth	16.3	< 0.1	25	1983-95, 1998

19	10251255	Fortymile Wash near Well J-13	304	3,000	200	1983-97, 1998
20	10251256	Dune Wash near Busted Butte	6.77	< 3.0	[1]nd	1982-95, 1998
25	10251260	Topopah Wash at Little Skull Mountain	104	< 1.5	30	1984-95, 1998
27	10251265	Cane Springs Wash near Cane Springs	8.36	< 5.0	110	1984-95, 1998
28	102512654	Cane Springs Tributary below Skull Mountain	2.29	15	< 5.0	1992-95, 1998
		Sites off the Nevada Test Site				
1	10251215	Beatty Wash near Beatty, Nev.	94.6	900	30	1989-95, 1998
2	10251217	Amargosa River at Beatty, Nev.	458	1,000	90	1993-95, 1996-98
3	10251225	Amargosa River at Big Dune near Amargosa Valley, Nev.	842	nd	20	1998
4	10251233	Solitario Canyon at Mouth near Yucca Mountain, Nev.	4.14	0	0	1995, 1998
5	10251235	Crater Flat Wash above Highway 95 near Amargosa Valley, Nev.	157	0	0	1995, 1998
21	10251258	Fortymile Wash near Amargosa Valley, Nev.	316	[2]1,200	[2]340	1983-98
22	102512585	Fortymile Wash at Amargosa Farms, Nev.	325	nd	[3]90	1998
23	10251259	Amargosa River at Highway 127 near Calif.-Nev. State Line	1,542	27	30	1993-95, 1998
24	102512597	Amargosa River at Death Valley Junction, Calif.	1,567	< 5.0	60	1995, 1998
26	10251261	Topopah Wash at Highway 95 near Amargosa Valley, Nev.	150	nd	20	1998
29	10251270	Amargosa River Tributary near Mercury, Nev.	110	0	25	1963-81, 1984-95, 1998
30	10251280	Amargosa River near Eagle Mountain below Death Valley Junction, Calif.	2,632	100	190	1990-95, 1998
31	10251300	Amargosa River at Tecopa, Calif.	3,090	170	250	1961-83, 1991-95, 1998
32	10251375	Amargosa River at Dumont Sand Dunes near Death Valley, Calif.	3,284	nd	200	1998

[1] Road repair and grading destroyed all high-water marks prior to peak-streamflow estimates, but it is believed by reconnaissance teams that runoff may have been substantial to cause such extensive road damage.

[2] Includes peak streamflow estimates in bypass channel of 300 ft^3/s (March 1995) and 7.0 ft^3/s (February 1998).

[3] Total of peak streamflow estimates in three principal channels.

Selected References

Beck, D.A., and Glancy, P.A., 1995, *Overview of runoff of March 11, 1995, in Fortymile Wash and Amargosa River, southern Nevada:* U.S. Geological Survey Fact Sheet FS-210-95, 4 p.

Desert Research Institute, 1998, *Western Regional Climate Center theme page:* accessed August 3, 1998, on the World Wide Web at URL <http://www.wrcc.dri.edu/cgi-bin/elnino1.pl>.

Grasso, D.N., 1996, *Hydrology of modern and late Holocene lakes, Death Valley, California:* U.S. Geological Survey Water-Resources Investigations Report 95-4237, 54 p.

Hardman, George, 1965, *Nevada precipitation map:* University of Nevada Agricultural Experimentation Bulletin 183, 57 p.

Laczniak, R.J., Cole, J.C., Sawyer, D.A., and Trudeau, D.A., 1996, *Summary of hydrogeologic controls on ground-water flow at the Nevada Test Site, Nye County, Nevada:* U.S. Geological Survey Water-Resources Investigations Report 96-4109, 59 p.

National Oceanic Atmospheric Administration, 1998, *El Nino theme page:* accessed August 3, 1998, on the World Wide Web at URL <http://www.pmel.noaa.gov/toga-taol/el-nino-story.html>.

National Weather Service, 1998, *Las Vegas home page:* accessed August 3, 1998, on the World Wide Web at URL <http://nimbo.wrh.noaa.gov/Lasvegas> [last updated June 9, 1998].

U.S. Geological Survey, 1993-97, *Water resources data, Nevada, water years 1992-96:* U.S. Geological Survey Water-Data Reports, NV-92-1 to NV-96-1 (published annually).

USGS Fact Sheet 036-01
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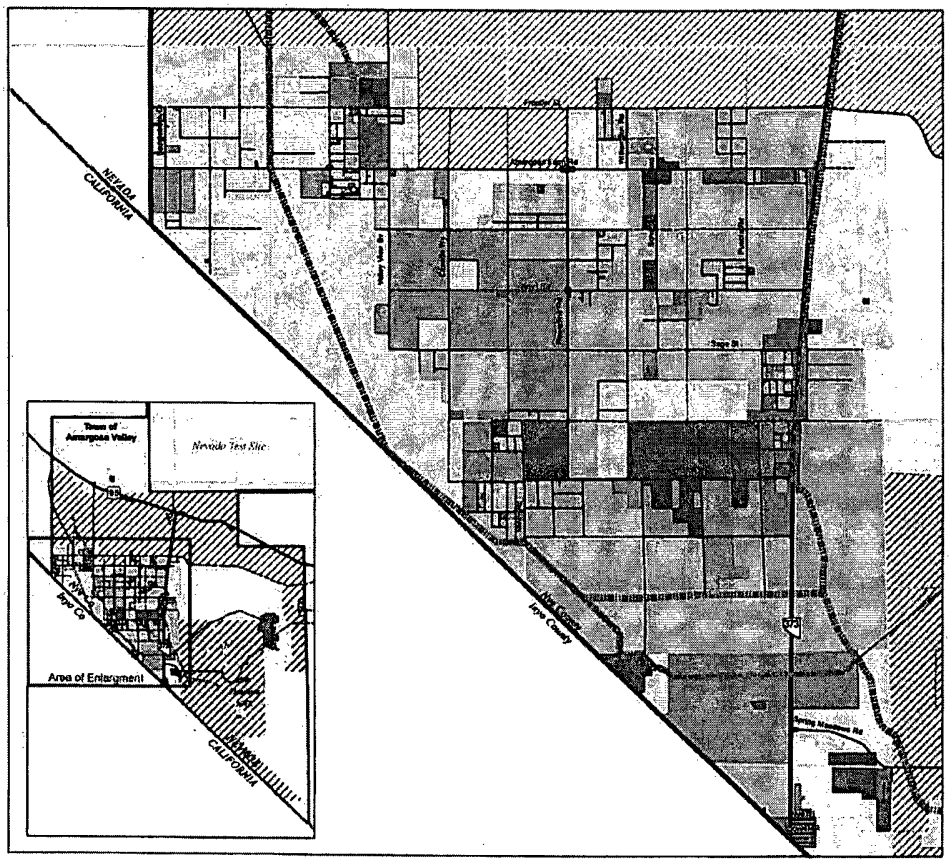

AMARGOSA VALLEY, NEVADA AREA PLAN

Map 4
Future Land Use

FUTURE LAND USE DESIGNATION

- AGP - Agricultural Production
- CDR - Community Development Reserve
- CUF - Community & Utility Facilities
- HDR - High Density Residential
- LDR - Low Density Residential
- OST - Open Space, Parks and Trails
- RAC - Rural Activity Center
- RCR - Rural Cross Roads
- RDR - Rural Density Residential
- RUI - Rural Industrial
- SDA - Special Development Area (Solar, Wind, and Other)
- SDA - Special Development Area (Federal)

BOUNDARIES

- Amargosa Valley Town Boundary
- Parcels
- Sections
- Township, Range

ROADS

- Paved Hwy
- Paved
- Unpaved

SOURCES:
Future Land Use designations automated for each parcel from inputs provided by the Amargosa Valley Mapping Group. The SDA YMP Gateway Area Concept Plan (June 2007) is available from the Nye County Nuclear Waste Repository Project Office. Parcels, road centerlines, Amargosa Valley Town boundary, and Township, Range, and Section boundaries from the Nye County GIS Repository (2008).

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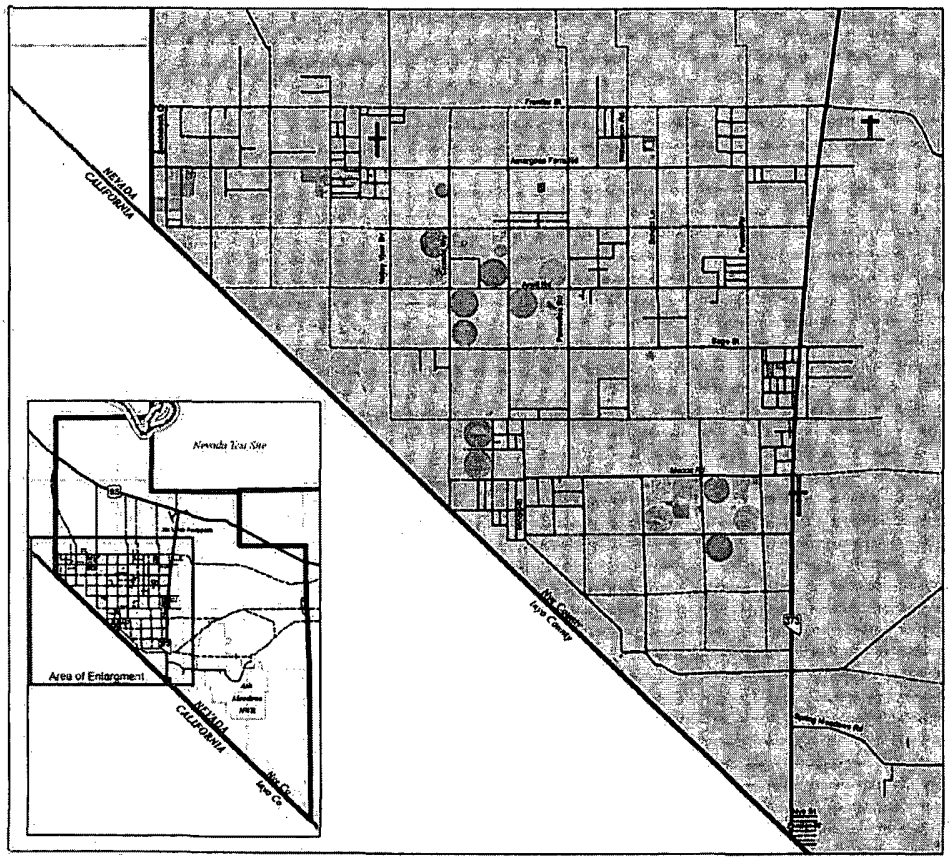

AMARGOSA VALLEY, NEVADA AREA PLAN

Map 5
Transportation

ROADS

- Paved Highway
- Paved Road
- Unpaved Road
- 4 Wheel Drive Trails
- Planned Road

AIRSTRIPS

- Airstrips

RAIL

- Proposed Yucca Mountain Caliente Rail Route

BOUNDARIES

- Amargosa Valley Town Boundary
- Sections
- Township, Range

SOURCES:
Existing road centerlines from the Nye County GIS Repository (2008). Planned roads input provided by the Amargosa Valley Area Plan Committee. Amargosa Valley Town and Township, Range, and Section boundaries from the Nye County GIS Repository (2008). Airstrips photo-interpreted from 2007 orthophotos. Proposed YMP Caliente Rail Route from Supplemental DOE Transportation EIR.

2 1 0 2 Miles

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Apr. 09, 2010

AV residents want Farm Road maintained

By MARK WAITE
PVT

MARK WAITE / PVT
Senora Fairchild, an employee of the company that prepared the Environmental Impact Statement, extends a microphone to Chris Wile, from the International Brotherhood of Electrical Workers, who spoke in support of the Solar Millenium project.

AMARGOSA VALLEY -- A few members of the crowd didn't want Solar Millenium building a solar energy project smack dab in the middle of Amargosa Valley.

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But the sentiment among other speakers at the public hearing on the draft Environmental Impact Statement Wednesday night was the two 232-megawatt, thermal, solar power plants will be all right for their community -- as long as they don't realign Farm Road.

"While I think most of us would like to see a solar plant in Amargosa Valley, we don't want to see it on Main Street in the middle of our town. I did quite a bit of research and did not find

a single solar plant in the world in the middle of a town. I think there are quite a few alternatives, and I think we should be looking at alternative placement," said Pat Minshall.

While representatives of various unions -- including Plumbers and Pipefitters Local 555, Sheet Metal Workers Local 88 and the International Brotherhood of Electrical Workers Local 357 -- spoke in support of the desperately-needed construction jobs, Amargosa Valley resident Roland Rajn felt few people in the valley would get those jobs.

The EIS estimated the project will create an average of 650 full-time construction jobs over a 39-month period, with a peak of 1,300 construction workers, and once built, it will employ 180 permanent workers.

"When the construction is done, this town will not be Amargosa Valley it will be Solar Millenium," Rajn said.

But a tearful Eunice Hernandez, in an emotional moment, said the project could bring work that will help her family survive.

"The jobs it's bringing to us will be good for my dad. He hasn't worked for two years and he's supporting a family of six, and that money is money we need," Hernandez said.

Matt Lydon, with Plumbers and Pipefitters Local 555, said half the 2,600 members of his union are unemployed. John Christiansen, with the sheet metal workers, said, "These are good jobs that enhance existing careers and create careers where people can work with dignity and retire with dignity."

Bill Verbeck, Pahrump Great Basin College director, said "If this project goes forward, it is about our economy and jobs." He said the actual unemployment rate locally is more like 20 percent, rather than the 15.2 percent in local statistics.

"We're here as a college and a community to do as much as we can to get as many of our locals trained as we possibly can," Verbeck said.

Stephen Burnage, who represented Renewable Energy Transmission Company Inc., predicted he would be standing in front of a public hearing in a year with a request to build a transmission line from the Amargosa Valley solar plant to other solar facilities in El Dorado Valley near Boulder City. That project will create more jobs, he said.

But resident Genne Nelson said she was concerned about air quality from dust.

"They say that they want to control the dust because of the mirrors, but we've seen what wind can do out here. I think at the very least these nice models are as good as the information that goes into them. There should be some accountability and some air quality monitoring for particulates to ensure they are meeting the standards," Nelson said.

Greg Helseth, U.S. Bureau of Land Management renewable energy project manager, said there will be a monitor assigned to

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the project if the BLM issues a record of decision to allow the company to use right-of-way on the 4,350-acre site.

Nelson also thought the standard of 55 decibels was too high for a quiet, rural valley.

John Bosta said the town board spent three years working on an Amargosa Valley master plan, which doesn't have a provision for solar projects south of Farm Road. He said one-third of the Solar Millenium project will be south of Farm Road.

Bosta added the plans show fences and trees to buffer the wind, but he said they couldn't construct a fence high enough. The trees would use water, he said.

"The next part is the people who live on Sandy Lane. Their view of the valley looking back towards the northwest is going to be totally obliterated. The other part that hasn't been brought up -- I don't think the EIS has adequately covered the dangers of explosions and fires to the people, especially those living on Sandy Lane," Bosta said.

Amargosa Valley Town Board Chairman Jan Cameron said she was more optimistic than some people in the room about the jobs the project will bring to local residents.

But she added, "On behalf of the vast majority of the people in this valley I want to say we don't want Farm Road moved, period. Farm Road is our only east-west thoroughfare that goes from one part of the valley to the other."

Cameron pointed out a technicality. The maps were still showing the original 7,300-acre footprint of the project, which included the land on which the community center was located.

"I, too, am concerned about the Sandy Lane folks who built their homes there. I know some Sandy Lane residents are happy, some are not," Cameron said. "They're not seeing this vista, with this plant on the western side of them. There may be only six houses that are concerned about it, but they are people. We live here. I do appreciate the efforts that are being made to try to mitigate the vision of the plant itself."

Linda Bromell said, "I don't think I heard anybody has an objection to this being out here." But she joined the audience members objecting to moving Farm Road.

"This is where all our schools and everything is. This road should absolutely not be moved. BLM told me last year they were looking into getting people to release the land farther out on (Highway) 95 where most of this project is," Bromell said.

The draft EIS pointed out another company, Cogentrix, filed an application for right-of-way on 13,440 acres north of the Solar Millenium site all the way up to Highway 95. While Solar Millenium filed an overlapping or second-in-line application for that land, the EIS noted Cogentrix planned to develop a solar plant on their land in the next two to three years and it was unlikely Solar Millenium's application could be processed.

Howard Blumenfeld just had questions: How much will the project save local residents in electricity costs? Does the reference to a 30-year project life mean it's done in 30 years? Why didn't they use all the military land north of Highway 95? Who is going to audit what happens to the water? Will water be recycled?

J.W. Cunningham said he's past working age but likes the idea of job opportunities in Amargosa Valley so youths don't have to leave for Las Vegas.

"The only thing that actually concerns me is the unions. Are they going to bring in all people from out of town, or is it going to be an opportunity for people in the valley to be employed? I think solar energy is a thing that's coming. Nobody's fighting it. It's going to be here," he said.

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Section 400
Drainage Law

401 INTRODUCTION

The materials contained in this chapter are not intended to be an exhaustive presentation of each area of law which is discussed. The purpose is to familiarize the design professional with these areas to enable them to better perform engineering duties and tasks. These materials should not be used in place of a consultation with an attorney and no liability is being assumed with respect to the use of these materials for such purpose.

An important lesson which has been learned in Southern Nevada is that water does not respect arbitrary jurisdictional boundaries. Water does not respect the various rights and liabilities of adjacent land owners as it flows through depressions, gulleys, and washes seeking ultimate terminus in Lake Mead. However, engineers are presented with the enormous task of attempting to control the drainage of water while at the same time maintaining the integrity of natural flow paths and existing legal relationships arising from land ownership. The goal of maintaining both natural flow paths and existing legal relationships is not easily achieved. However, this goal can be more easily achieved if the engineer is familiar with the basic legal framework against which legal relationships will be adjudicated.

This chapter discusses the historical evolution of water drainage law in Nevada. Unlike other states such as California and Colorado, there is not a great body of Nevada case law which discusses every identifiable issue with respect to water drainage law. There are many "gray" areas in Nevada law, but the engineer can avoid major legal obstacles by being more familiar with those cases which have been expressly decided by the Nevada Supreme Court. Relevant statutes will also be discussed.

402 HISTORICAL EVOLUTION OF SURFACE WATER DRAINAGE LAW

Prior to a specific discussion of Nevada law, it is important for the engineer to be aware of the development of the historical principles and theories involved in drainage law. There are three common early doctrines which were followed in the United States. The doctrines were the common enemy doctrine, civil law rule, and the rule of reasonable use. Each theory will be briefly examined prior to an in depth analysis of Nevada law.

402.1 The Common Enemy Doctrine

The common enemy doctrine is a harsh rule which is still followed in some states. The common enemy doctrine has not been specifically recognized by the Nevada Supreme Court.

Stated in its extreme form, the common enemy doctrine provides that as an incident to their right to use their own property as they please, each landowner has an unqualified right, by operations on their own land, to fight off surface waters as they see fit without being required to take into account the consequences to other land owners, who have the duty and right to protect themselves as best they can. See 93 ALR 3d 1193.

Surface water was thus regarded as a common enemy which each property owner could fight off or control by any means such as retention, diversion, repulsion or altered conveyance. Thus, there was no cause of action even if some injury occurred to the adjoining parcel.

All jurisdictions originally following this harsh rule have either modified the rule or adopted the civil law rule or reasonable use Rule 5 Water and Water Rights, Sections 450.6-451.2 (RE Clark ED. 1972).

As previously mentioned, the Nevada Supreme Court has not specifically recognized or adopted this theory.

402.2 Civil Law Rule

Courts later recognized the rule of water drainage law which is basically diametrically opposed to the common enemy doctrine. The civil law rule recognizes a natural servitude for natural drainage between adjoining lands, so that the lower owner must accept the surface water which naturally drains onto their land, but, on the other hand, the upper owner has no right to change the natural system of drainage to increase the burden on the lower parcel. This rule caused problems with allowing development because virtually almost any development has a tendency to increase the flow either in quantity or velocity. According to the civil law rule, if the quantity or velocity of water flow were increased, the natural flow on the downstream property would be changed and would be in violation of the civil law rule. Thus, with the evolution of drainage law the courts sought to modify the law to consider the competing interests of adjoining land owners and allocate the burden of risk attendant to development.

The civil law rule analyzes drainage problems in terms of property law concepts such as servitudes and easements. It did not consider tort law analysis of what is "reasonable".

The Nevada Supreme Court specifically recognized the civil law rule as early as 1885 in the case of Boyton v. Longley, 19 Nev. 69,6 Pac. 437 (1885). This case will be discussed in detail in the analysis of Nevada Drainage Law.

402.3 Reasonable Use Rule

The rule of reasonable use was developed as an alternative between the civil law rule and the common enemy doctrine. The courts attempted to balance the hardships created in attempting to control surface waters and relevant factors in the relationship between the competing rights/liabilities of adjoining land owners. The rule was apparently developed to provide flexibility in avoiding harsh results which often occurred in applying both the common enemy doctrine and the civil law rule to various factual situations.

Under the reasonable use rule, a property owner can legally make reasonable use of their land, even though the flow of surface waters is altered and causes some harm to others. However, liability occurs when the property owners' harmful interference with the flow of surface water is "unreasonable". A balancing test is utilized to determine whether a landowners use of their property is unreasonable. The analysis involves three basic questions: (1) was there reasonable necessity for the property owner to alter the drainage to make use of their land? (2) was the alteration done in a reasonable manner? (3) does the utility of the actor's conduct reasonably outweigh the gravity of harm to others? See, Restatement Torts, §22-831,833 (1939).

The Nevada Supreme Court has recognized consideration of at least five factors in determining whether a property owner's conduct was reasonable. As one can see from this analysis, it becomes very difficult to predict how a jury would rule in relationship to any particular set of facts because the standard for determination is reasonableness, and each jury will have its own standard for determining reasonable conduct.

The reasonable use rule does not utilize property law concepts of servitude and easement. It substitutes a tort analysis of "reasonable" conduct. The positive aspect of this rule is that it accommodates development and allows for alterations of surface flow if done in a responsible manner. The negative aspect of this rule is the uncertainty created by the vague standard regarding "reasonable" conduct. One engineer's "reasonable" design for handling surface waters may be perceived by a different engineer in a court of law as "unreasonable."

403 NEVADA DRAINAGE LAW

The Nevada Supreme Court initially adopted the civil law rule of drainage in 1885. The civil law rule was later changed when the Nevada Supreme Court adopted the reasonable use rule for surface water drainage in 1980. However,

It is important for the engineer to be familiar with both cases in order to understand the evolution of Nevada Drainage Law and its underlying public policy considerations.

403.1 Civil law Rule

In 1885 the Nevada Supreme Court was presented with a novel question. Can an upper land owner drain artificially collected waters onto their neighbor's lower parcel? This question had never been presented before because most property owners usually complained of lack of water rather than an excess of water.

In Boyton v. Longley, 19 Nev. 69, 6 Pac. 437 (1885) an upper land owner used an irrigation ditch to collect water from the Truckee River and irrigate his farm. The irrigation water naturally flowed onto an adjacent parcel. The lower land owner sued to recover damages for his land and crops allegedly caused by the waste water.

The upper land owner made several arguments as follows: irrigation was necessary to cultivate his land, the lower land owed a servitude to the upper parcel to receive water which naturally flowed on to it, he had been irrigating his land for five years, and therefore, had obtained a prescriptive easement across the lower piece of land. The lower land owner argued there was not a natural right to discharge water from artificial sources.

In ruling in favor of the lower land owner, the Nevada Supreme Court noted as follows:

> "...As to the flow of water caused by the fall of rain, the melting of snow, or natural drainage of the ground, the prevailing doctrine is that when two tracts of land are adjacent and one is lower than the other, the owner of the upper tract has an easement in the lower land to the extend of the water naturally flowing from the upper land to and upon the lower tract, and that damage that may be occasioned to the lower land thereby is damnum absque iniuria (injury without damage). Water seeks its level and naturally flows from a higher to a lower plane; hence the lower surface, or inferior heritage is doomed by nature to bear a servitude to the higher surface, or superior heritage, in this: that it must receive the water that naturally falls on and flows from the level. The proprietors of the lower land cannot complain of this - this expression of the law only applies to waters which flow naturally from springs, from storms of rain or snow, or the natural moisture of

> land. Wherever courts have had occasion to discuss this question they have generally declared that the servitude of the lower land cannot be augmented, or made more burdensome by the acts of industry of man."
>
> 19 Nevada at 69, 72-73.

The court observed that in order to cultivate their respective lands, both parties had to obtain irrigation water by bringing it from points remote and distant from their lands. Without the "reasonable use" of the water, the lands were comparatively worthless.

The Nevada Supreme Court held that the upper land owner, while they have the unqualified right to make reasonable use of the water for irrigation, must use, manage, and control the water as to not injure an adjacent parcel. Central to the court's holding is the concept that a land owner should not be permitted to make his land more valuable by an act which renders the land of a lower land owner less valuable. This policy consideration would later be utilized by the Nevada Supreme Court almost 95 years later when the reasonable use rule was adopted.

Thus, until the reasonable use rule was adopted in 1980, Nevada Drainage Law consisted of a property law analysis of natural easements for upper parcels to drain water over lower parcels.

403.2 Reasonable Use Rule

Approximately 95 years passed in Nevada before the Nevada Supreme Court was presented with the opportunity to change drainage law in Nevada. The court adopted the reasonable use rule in 1980 when presented with a modern factual situation which opened the door for Nevada to join the majority of jurisdictions in the western states by adopting the reasonable use rule. The case in which the reasonable use rule was adopted was controversial not only when it was decided, but remains somewhat controversial for all of the questions it does not answer.

The Nevada Supreme Court changed Nevada drainage law in County of Clark v. Powers, 96 Nev. 497, 611 P.2d 1072 (1980). Land owners had filed an action against the County and various developers because their activities allegedly had altered the drainage of surface waters in their area. The plaintiffs settled with the individual developers prior to trial, and proceeded to trial against the County and the County Flood Control District under theories of inverse condemnation, nuisance, and trespass. The trial court adopted the reasonable use rule and entered an award for the plaintiffs.

The Nevada Supreme Court found that during the 1950's and early 1960's, the plaintiffs had acquired their parcels and developed them for residential use. Prior to major development in the area, the land immediately west of the two plaintiffs' parcels was sufficiently porous to absorb and dissipate most rain waters. Heavy rains, however, would collect in the low surrounding areas and would follow the natural terrain entering the plaintiffs' properties at the approximate border between the two properties. These waters would flow, if at all, at a slow velocity and would be naturally dissipated and absorbed. Flooding was rare. The "ephemeral stream" on the plaintiffs' property paralleled a wash which ran to the south of the plaintiffs' parcel.

The court found that starting in 1967 the development of the lands west of the plaintiffs' parcel resulted in the alteration, diversion, channeling and acceleration of rain, nuisance, and flood waters on to respondents' properties. The court found the County had actively participated in the development of these lands, both by its own planning, design, engineering, and construction activities and by its adoption of the similar activities of various private developers as part of the County's Master Plan for the drainage and flood control of the area.

The facts as determined at trial established various roads and intersections had been elevated, waters were collected and diverted from a grocery store site, and channeled those waters to a drainage pipe maintained by the County. Similarly, the streets, curbs, and gutters were specifically designed to divert and channel waters onto the plaintiffs' parcels which normally would have drained to the wash. The court held that the cumulative effect of the development activities was to increase and accelerate the flow of waters through the ephemeral stream between the plaintiffs' parcels, to divert waters normally draining into the wash onto the plaintiffs' properties, and to alter and divert the natural course of the ephemeral stream. The property was subjected to temporary but frequent and inevitable flooding.

The County argued that the civil law rule should be maintained. The Nevada Supreme Court felt that the question of which law to apply to surface water drainage entailed a judgment concerning the proper allocation of costs incident in the transformation of rural or semi-rural areas into urban and suburban communities. In making its judgment the court identified three central principles from prior decisions: one, the law of water rights must be flexible, taking notice of the varying needs of various localities; two, a land owner may make reasonable use of his land as long as he does not injure his neighbor; and three, a land owner should not be permitted to make his land more valuable at the expense of the estate of a lower land owner.

The court found that the civil law rule was ill suited to the complexities of urban growth and expansion, and found the reasonable use rule to be more predictable and suited to modern development. The court held that in effecting

a reasonable use of land for legitimate purpose, a land owner or user, acting in good faith, may drain surface waters and cast them on a neighbor's land if:

a) The injurious flow of water is reasonably necessary for drainage;

b) Reasonable care is taken to avoid unnecessary injury;

c) The benefit to the drained land outweighs the gravity of harm inflicted upon the flooded land;

d) The drainage is accompanied, where practicable, by the reasonable improvement and aiding of normal and natural systems of drainage in accordance with their reasonable caring capacity; and

e) Where no natural systems of drainage are available, the drainage is accomplished by the use of a reasonable, artificial system of drainage.

The reasonable use rule was adopted by the court because it felt that the economic costs incident to the expulsion of surface waters in the transformation of rural and semi-rural areas into urban and suburban communities should not be borne solely by adjoining land owners. Rather, land owners, developers, and local officials, should take into account the costs of development of the community prior to the implementation of their plans. The court found that absent such prior planning, of reasonable use rule allows for a more equitable allocation of the incidental economic costs than did the civil law rule.

The County also argued it had statutory immunity for damages which were caused by "urbanization." The Nevada Supreme Court rejected the concept of limited sovereign immunity, and held as follows:

> "we...chose to follow the view, adopted in a majority of jurisdictions, that a governmental entity's substantial involvement in the development of private lands which unreasonably injures the property of others is actionable." 96 Nev.a505.

The NRS which confer immunity from suit for discretionary acts of County employees, were not argued at the trial court level and therefore were specifically not considered on appeal. It remains an open question regarding the effect discretionary immunity might have played in this case. Similarly, the factual situation included both the acts of private developers and the County. It is therefore impossible to determine whether the court focused its decision regarding County liability on the fact that a County constructed and maintained drainage pipe was related to the plaintiffs' flood problems.

Although the Powers case changed Nevada law, it leaves many questions unanswered such as: (1) Is the governmental entity liable for mere approval of a private development; (2) What constitutes "substantial involvement" in the development of private land? (3) Is a governmental entity liable if it fails to detect design or construction deficiencies in a private design? and (4) Is a governmental entity liable for privately designed flood control improvements which are later dedicated to the entity? The Powers case is the controlling legal precedent in this State. Engineers should be aware of the balancing test set forth in the decision, as well as the underlying factual situation. The balancing test should be considered when an engineer is designing or approving alternate methods of handling water drainage. As previously mentioned, one engineer's "reasonable" drainage approach could be a juror's "unreasonable" diversion.

403.3 Surface Waters - Private Development

Engineers and developers working in the private sector are presented with similar liability exposure as governmental entities, but do not enjoy the same statutory protections. A brief discussion of each liability theory is important for the engineer to have a sense of the potential exposure he or she faces when proceeding with a design project.

403.3.1 Negligence

Negligence has been defined by Black's Law Dictionary as "the omission to do something which a reasonable man, guided by those ordinary considerations which ordinarily regulate human affairs, would do, or the doing of something which a reasonable and prudent man would not do."

Placing the negligence definition into an engineering context, the reasonable and prudent man standard becomes a reasonable professional and prudent professional standard. Thus, a professional engineer who fails to act within the standard of care of his engineering profession may be held liable for negligence. The applicable standard of care is established in court by expert testimony.

The concept of negligence is composed of the traditional elements of duty, breach of the duty, the breach resulting in the proximate cause of damage, or injury. Prosser, Torts 143 (4th Ed. 1971). Nevada courts and courts across the nation have broadly interpreted the duty element as a duty being owed to all persons who may foreseeably be affected by the work being performed.

In order for the engineer to determine if he faces potential negligence exposure, it is helpful to analyze the project and its relation to the engineering activities which are being performed. The engineer should attempt to determine what the standard of care in his profession is in relationship to the particular engineering task being performed and then make a realistic

evaluation as to whether or not the services he has rendered would meet that standard. For example, using the Rational Method for a watershed in excess of 100 acres, rather than the HEC-1 computer model required by this MANUAL, may fall below the standard of care and could result in potential liability. The engineer should always strive to use the best information available and also strive to use methods which are state of the art and widely accepted by the engineering profession.

Complying with legally required procedures (i.e., contained in this MANUAL) have been held by the courts to be a minimum standard of care.

Unfortunately, an engineer cannot always be guaranteed that by merely following the computer models and design procedures contained in this MANUAL he will be insulated from negligence liability. It is possible that in a particular area of design the engineer's standard of care could require a higher standard of engineering activities. However, following the requirements of this MANUAL will go a long way toward establishing that an engineer has met the accepted standard of care.

403.3.2 Breach of Express/Implied Warranty

The liability theory can be based on either an implied warranty or an express warranty. Under this particular theory of liability an engineer does not face the same exposure as a developer who actually sells a finished product.

The courts have generally held that an implied warranty normally requires privacy of contract between the person bringing the action and the party who allegedly breached the implied warranty. An implied warranty only goes to the product and may not be imputed to one who has provided services as opposed to the product. Thus, a private engineer who has designed plans does not face the same liability exposure as a developer who has sold a completed product.

403.3.3 Fraud/Misrepresentation

Fraud is a much less commonly-pled liability theory because it is much harder to prove. The Court requires "clear and convincing" evidence that fraudulent conduct has occurred.

Fraud in the general sense is deemed to be any conduct which is calculated to deceive another person or entity and results in damage.

The essential elements required to sustain fraud action are the representations made as a statement of fact (not genuine) which was untrue and known to be untrue by the party making it, or else recklessly made; that the statement was made with intent to deceive and for the purpose of inducing the other party to

act upon it, and the person did in fact rely on it and was induced to act to his detriment. AmJur.2d, Fraud & Deceit, Sections 2, 12.

An example of fraudulent conduct would be an engineer or developer telling a potential home purchaser that the home was not located in a floodplain when the engineer/developer knew for a fact that the statement was false. If the purchaser relies on that representation and purchases a home in the subdivision, then a potential case of fraud exists.

403.3.4 Trespass

Trespass is an injury to possession. It is an intrusion which invades a person's protected interested in exclusive possession. A trespass action requires active conduct on the part of the wrongdoer. Liability can be imposed for intentional, negligent or ultrahazardous activity. The only "intent" required is that the act constituting the trespass is voluntarily done. An act may constitute a trespass despite the fact that its consequences were unintended. 75 AmJur.2d, Trespass, Section 8.

In general, one is subject to liability for trespass to real property if one intentionally enters land in the possession of another or causes a thing or force to do so. A landowner who sets in motion a force which, in the usual course of events, will damage the property of another is guilty of trespass on such property. **Burt v. Beautiful Savior Lutheran Church, 809** P.2d 1064 (Colo.Ap. 1990).

Nevada has defined trespass as an injury to an estate, or use thereof, by one who is a stranger to the title of the injured property. **Price v. Ward,** 25Nev.20358Pac.849 (1899).

An example of this liability theory would be damage to real property caused by waters escaping from a drainage channel or damaging a subdivision as a result of an improperly designed drainage system. The damage occurs when the water flows on the person's property and in turn damages the real property, personal property and possessory interest of the landowner. Such damage easily occurs once water begins to flow onto a property and into the front door of someone's home. The lancowner need not prove that the engineer or developer intentionally flooded the property, but merely that the act of designing and constructing the flood control improvement were done voluntarily. As previously noted, the liability for trespass can be based on negligent conduct.

Flooding of a person's property because of improper construction of highway embankments constitutes trespass. **Viestenz v. Arthur** TP, 54 N.W.2d.572 (ND 1952). Where the defendant's affirmative act results in the flooding of the plaintiff's land and the destruction of crops, the defendant has constituted

trespass. **Western Union Tel. Co. v. Bush,** 89 S.W. .2d 723 (Ark. 1935). However, floods resulting solely from a severe storm do not constitute trespass. **Hughes v. Kim's County**, 714 P.2d 316, (Wash. Ap. 1986).

Pursuant to the trespass liability theory, damages generally constitute the difference in value of the land both before and after the act. Damages can also include the loss of use of the land, discomfort and annoyance to the property owner, cost of repair, and lost crops.

A warning sign for dual use facilities is shown in **Figure 401** and shall be posted not more than 200 feet on each side of the facility, upon or near the boundary. Warning signs shall be mounted on a metal fence post, and shall be painted with fluorescent orange paint. **Figure** 402 depicts a warning sign for flood channels.

403.3.5 Nuisance

The "nuisance" liability theory applies to that class of wrongs that is covered by the unreasonable, unwarrantable, or unlawful use by a person of his property, or from his improper, indecent or unlawful conduct, which operates as an obstruction or injury to the right of another or to the public, and producing such material annoyance, inconvenience, discomfort or hurt that the law will presume consequential damage. **Bliss v. Gravson, 24 Nev.422, 56** Pac.231 (1899).

The term "nuisance" is incapable of an exact and exhaustive definition which will fit all cases because the factual situations are seldom alike. Nevertheless, "nuisance" has been defined as a distinct civil wrong, and is used to describe the wrongful invasion of a legal right or interest. "Nuisance" includes everything that endangers life, health, or obstructs the reasonable and comfortable use of property. 58 AmJur.2d, Nuisance, Section 1.

Nuisance and trespass are analogous in some respects. However, there is a distinction between them, the difference being that trespass is an invasion of the person's interest in the exclusive possession of his land (as by entry on it) while a nuisance is an interference with the use and enjoyment of the land, and doesn't require interference with the possession. The requisites that an interference be substantial and unreasonable, in order to constitute a nuisance, have been said to distinguish an action for nuisance from that of trespass. In this regard, an action for trespass can be maintained without a showing of damage because it is the unauthorized entry upon the land that creates the trespass and the presumed damage.

A claim of nuisance is more than a claim of negligence. Negligent acts do not in themselves constitute a nuisance; rather, negligence is merely one type of conduct upon which liability for nuisance may be based.

This liability theory primarily involves the annoyance and inconvenience which people experience once their property has been flooded. The flood clean-up process and associated odors, filth, and insect infestation would fall within this theory. In many ways, this theory closely tracks claims for emotional distress and can provide dramatic testimony for a jury. Even something as minor as increased flow in an irrigation ditch has been deemed a nuisance in Nevada. **Thomas v. Blaisdell, 25 Nev.223, 58 Pac.903 (1899).**

403.3.6 Strict Liability

Nevada has recognized that an end user of a "product" has established a cause of action in strict liability against a manufacturer or distributor when "his injury is caused by a defect in the product, and the user proves that such defect existed when the product left the hands of the defendant." Shoshone Coca-Cola Bottling v. Dolinski, 82 Nev. 439, 443, 420, P.2d 855, 858 (1966).

California has applied the strict liability theory to the sale of homes and defective lots. The Nevada Supreme Court noted in Ellev v. Steven, 104 Nev.Adv.Op. 62, **N.2** (1988) that courts are divided about whether a home is a product under strict liability theory. In that case of Nevada Supreme Court was presented with this issue but was able to decide the case without ruling on the applicability of the strict liability theory. As the law currently stands in Nevada, the strict liability theory does not apply to homes. However, this theory could be extended to a situation where a "product" is sold by someone in the regular course of its business.

403.3.7 Punitive Damages

The above liability theories can support both an award of compensatory damages and punitive damages. Compensatory damages are to compensate a person for specific damages such as property repair or replacement costs. However, the private developer faces a possible award of punitive damages which can be unrelated to the actual damages suffered by the land owner.

NRS 42.010 provides as follows:

> "In an action for the breach of an obligation not arising from contact, where the defendant: (1) has been guilty of oppression, fraud or malice, expressly implied; or (2) caused an injury by the operation of a motor vehicle in violation of NRS 484.379 or 484.3795 after willfully consuming or using alcohol or another substance, knowing that he would thereafter operate the motor vehicle.

> The plaintiff, in addition to actual damages, may recover damages for the sake of example and by way of punishing the defendant."

The concept of punitive damages rests upon a presumed public policy to punish a wrongdoer for his act and to deter others from acting in similar fashion. The punitive damage allowance should be in an amount that will promote the public interest without financially annihilating the defendant. Nevada Cement Company v. Lemler, 89 Nev. 447,514 P.2d 1160 (1973).

Since the purpose of punitive damages is to punish and deter culpable conduct, the award lies in the discretion of the court or jury and need not bear a fixed relationship to the compensatory damages awarded. Randano v. Turk, 86 Nev. 123, 466 P.2d 216 (1970).

The "malice" contemplated in NRS 42.010 is malice in fact and which the malice is established. Malice in fact sufficient to support an award of damages may be established by a showing that the wrongful conduct was willful, intentional and done in reckless disregard of its possible results. Nevada Credit Rating Bureau Inc. v. Williams, 88 Nev. 601, 503 P.2d 9 (1972).

In Village Development Company v. Filice, 90 Nev. 305 P.2d 83 (1974), the Nevada Supreme Court was presented with a case involving a claim for damages arising from the destruction of a home constructed in an undisclosed floodplain and the subsequent claim for punitive damages. The lot purchaser brought an action to recover damages from the developer of a lot which was situated in an undisclosed floodplain of a mountain stream. The District Court awarded compensatory and punitive damages and the developer appealed. The Nevada Supreme Court found the developer was aware that a stream which crossed the plaintiff's lot usually was quite narrow but varied radically under various storm conditions of given return frequencies. Despite knowledge of the developer's officers regarding the extent of the floodplain, the developer did not impose any building restriction other than requiring that building plans be submitted to an architectural control committee. Knowing of the flood hazard, the developer assumed the plaintiff would build on the highest possible site on the lot, but never advised the lot purchasers of its thoughts regarding a proper building site. In short, the court found that the corporation's highest management personnel failed to warn of the danger although they well knew the plaintiffs were planning to build in the floodplain. Plans were submitted to the architectural control committee and approved without warning.

The court held that there was ample evidence to support a jury instruction regarding negligence and that the resulting award under that theory was proper. After carefully reviewing the record the court found that although there was ample evidence of negligence and unconscionable irresponsibility, there was insufficient evidence to support a finding of "oppression, fraud or malice

express or implied." The court noted it had previously sustained punitive damage awards when the evidence showed the wrong was willful. Here, the evidence was insufficient to meet the requirement that more must be shown than malice in law, and that there should be substantial evidence of malice in fact.

The above case indicated how the private developer can face punitive damage exposure. Although in the case above the developer escaped punitive damage exposure, it could easily have faced punitive exposure if representations had been made to the purchaser such as the property was not located in the floodplain, or that flooding was not likely in that area. If an area is located in a floodplain that fact should be fully disclosed to the purchaser and proper engineering procedures consistent with the standard of care should be followed.

403.4 Surface Waters - Governmental Entity Liability

The liability of a governmental entity with respect to surface waters is treated differently in some respects than the liability of a private developer even though the same liability theories can be asserted. The State legislature has conferred various statutory defenses, immunities, and damage limitation in view of the burden regarding land development which has been placed upon the governmental entities. Governmental entity tort liability is controlled by Chapter 41 of the NRS which was adopted in 1965.

403.4.1 Sovereign Immunity

The principle of sovereign immunity can be traced back to ancient times in England when a person could not sue the King. This concept has carried through the common law and has appeared in statutory provisions in most states. NRS 41.031 contains a waiver of sovereign immunity which is expressly limited by several other statutes containing specific defenses. The purpose of the limited waiver of sovereign immunity is to compensate the victims of governmental negligence in circumstances like those in which victims of private negligence would be compensated. Harriaan v. City of Reno, 86 Nev. 678, 475 P.2d 94 (1970).

The legislative intent in enacting NRS 41.031 was to waive the immunity of governmental units and agencies from liability for injuries caused by their negligent conduct, thus putting them on equal footing with private persons committing torts. Jimenez v. State, 98 Nev. 204, 644 P.2d 1023 (1982).

In close cases where the issue of whether the allegations of conduct fall within the parameters of a waiver of sovereign immunity, courts must favor a waiver of immunity; only when it is concluded that a discretionary act alone is involved

will the court find immunity. Haablom v. State Director of Motor Vehicles, 93 Nev. 599, 571 P.2d 1172 (1977).

NRS 41.031 initially provided for a special claims procedure when a person wanted to sue the State. However, the Nevada Supreme Court eliminated this requirement in 1973.

403.4.2 NRS 41.032 - Discretionary Immunity

NRS 41.032 provides that no action may be brought under the limited waiver of immunity statute or against an officer or employee of the State or any of its agencies or political subdivisions which is based upon the following:

a. An act or omission of an officer or employee, exercising due care, in the execution of a statute or regulation, whether or not such statute or regulations is valid, if the statute or regulation has not been declared invalid by a court of competent jurisdiction; or

b. Based upon the exercise of performance or the failure to exercise or perform a discretionary function or duty on the part of the State or any of its agencies or political subdivisions or any officer or employee of any of these, whether or not the discretion involved is abused.

The discretionary function immunity initially was a very strong defense for governmental agencies. However, over the years various interpretations of the statute by the Nevada Supreme Court have eroded its effectiveness.

The Nevada Supreme Court has analyzed discretionary immunity in terms of the type of functions the governmental entity is performing at the time. The governmental (discretionary) function is the initial decision to act. A discretionary function can be categorized as a decision to build a freeway, flood control channel, or parking structure. Once the discretionary decision to act has been made, then the governmental entity shifts into the operational function which usually involves construction and design. The governmental entity is obligated to use due care when acting in the operational function area.

The discretionary immunity cases can generally be divided into the following areas: road/street, police protection, and miscellaneous. One case from each area will briefly be discussed to give the engineer a sense of the analysis which is engaged in by the Supreme Court.

In the case of State v. Webster, 88 Nev. 690, 504 P.2d 1316 (1972) horses wandered onto a frontage road and then onto a newly constructed controlled access freeway near Carson City. An accident later resulted when a car struck the horses. The plaintiffs sued the State on the theory that the State was negligent for not providing a fence to keep animals off the freeway. The Nevada Supreme Court held that the governmental (discretionary) function was the decision to build a controlled access freeway, rather than continuing an old two lane highway. Once the discretionary decision regarding construction was made, the State was obligated to use due care to make the freeway meet standards of reasonable safety. The court held the State was negligent for failing to install a cattle guard.

In Parker v. Mineral County, 102 Nev.Ad.Op. 131 (1986) a person cutting firewood saw another person lying on the side of a rural road who apparently needed help. After the person on the ground has refused assistance, the firewood cutter reported the incident to a Sheriff's deputy who said they would take care of the situation. No one responded to the report and the person by the side of the road later died of exposure. The police department was sued for failure to respond to the call. The Nevada Supreme Court, in upholding a ruling in favor of Mineral County Sheriff's Department, held that personal deliberation, decision and judgment are requirement of a discretionary act. In deciding not to respond to the call the County officials exercised their personal judgment as to how their limited resources should be utilized to best promote the public good. Such a decision could not be second guessed by the court.

In Esmeralda Counts v. Grogan, 94 Nev. 923 (1978) the Nevada Supreme Court held that the decision to grant, revoke, or withhold a liquor license is a discretionary act.

403.4.3 NRS 41.033 - Failure to Inspect

NRS 41.033 provides that an action may not be brought against the State under the waiver of sovereign immunity or against an officer or an employee of the State based upon the following:

a. Failure to inspect any building, structure, or vehicle, or to inspect the construction of any street, public highway or other public work to determine any hazards, deficiencies or other matters, whether or not there is a duty to inspect; and

b. Failure to discover such hazard, deficiency or other matter, whether or not an inspection is made.

An initial reading of this statute would seem to confirm broad protection for the governmental entity. However, subsequent interpretations of this statute by the Nevada Supreme Court eroded its effectiveness.

The protection provided by this statute can only be obtained if the government entity does not have actual notice of a hazard or dangerous condition. For instance, in Crucil v. Carson City, 95 Nev. 583, 600 P.2d 216 (1979) it was held that where the City allegedly had knowledge of a downed stop sign in an intersection and failed to act reasonable after discovering it, that NRS 41.033 did not provide immunity against such suit.

The State's protection under NRS 41.033 can also be altered by contract. In 1975 the City of North Las Vegas was sued when a person was electrocuted while working on a billboard and touched a high voltage line. Approximately 20 years before the accident the City had signed a franchise agreement with Nevada Power in which the City agreed to inspect the power lines in return for a certain percentage of the gross revenues attributable to the citizens of North Las Vegas. The court held the agreement imposed a contractual duty to inspect the power lines which superseded any protection provided by NRS 41.033.

In Butler v. Bogdanovich, 101 Nev. 499 (1985) a person built a home that was inspected and approved by the County. Several years later the plaintiffs purchased the home and found approximately 25 substantial building code violations and sued the County. The Nevada Supreme Court held that if the County had knowledge of the defects, the County owed a duty to the plaintiffs to take action as a result of the discovery of the deficiencies. The court held sovereign immunity would not bar actions based upon a public entity's failure to act reasonably after learning of a hazard. This case highlights the effect of actual notice eliminating certain sovereign immunity defenses.

403.4.4 Limitation of Tort Damage Awards

NRS 41.035 generally provides two important limitations on the types of damage claims which can be awarded against a governmental entity.

The first limitation on damages awards limits a person's recovery in tort against a governmental entity to a maximum of $50,000. The stated damage limitation applies to an individual for each cause of action which may be asserted against the State, regardless of how many actions he or she may have even if more than one action arose from a single event. State v. Webster, 88 Nev. 690, 504 P.2d 1316 (1972).

The second important damage limitation prevents an award of punitive damages against the State. This is a very important distinction between governmental and private liability. A private developer may be held liable in punitive damages which can range far in excess of any compensatory

damages which are awarded to a plaintiff, while a governmental entity is protected from such damages. However, government entities can be sued in inverse condemnation while a private developer is protected from such an action.

403.4.5 Inverse Condemnation - Eminent Domain

The subject of Eminent Domain is extremely complex. However, a brief overview of this area is necessary for the engineer.

Article 1, Section 8 of the Nevada State Constitution provides in pertinent part that private property shall not be taken for public use without just compensation having been first made or secured, except in cases of war, riot, fire or great public peril, in which case compensation will be made later. Private property cannot be taken for a private use and can only be taken for a public use by a specific act of the governmental entity.

Eminent domain and inverse condemnation are basically the same concept but from a different perspective. If a governmental entity needs to obtain land for the construction of a flood control project, then the land is obtained by filing an eminent domain proceeding in which the land is condemned and the land owner is paid "just compensation" for the land. If a land owner claims that the property has been taken for a public use without just compensation being first made, then an inverse condemnation action is filed by the land owner seeking compensation from the governmental entity for the land.

Chapter 37 of the NRS governs eminent domain actions. Specifically, NRS 37.010(3) and (5) provides that the right of eminent domain may be exercised for the public purpose of "draining any County" or "for draining and reclaiming lands." Thus, obtaining property for flood control purposes has been specifically recognized by State statutes. Chapter 37 contains the statutes governing the acquisition and valuation process.

Chapters 340 and 342 of the NRS also contain additional information regarding eminent domain procedures and acquisition of real property. Of particular interest is NRS 342.280 which provides that no public body shall intentionally make it necessary for an owner to institute legal proceedings to prove the fact of the taking of his real property.

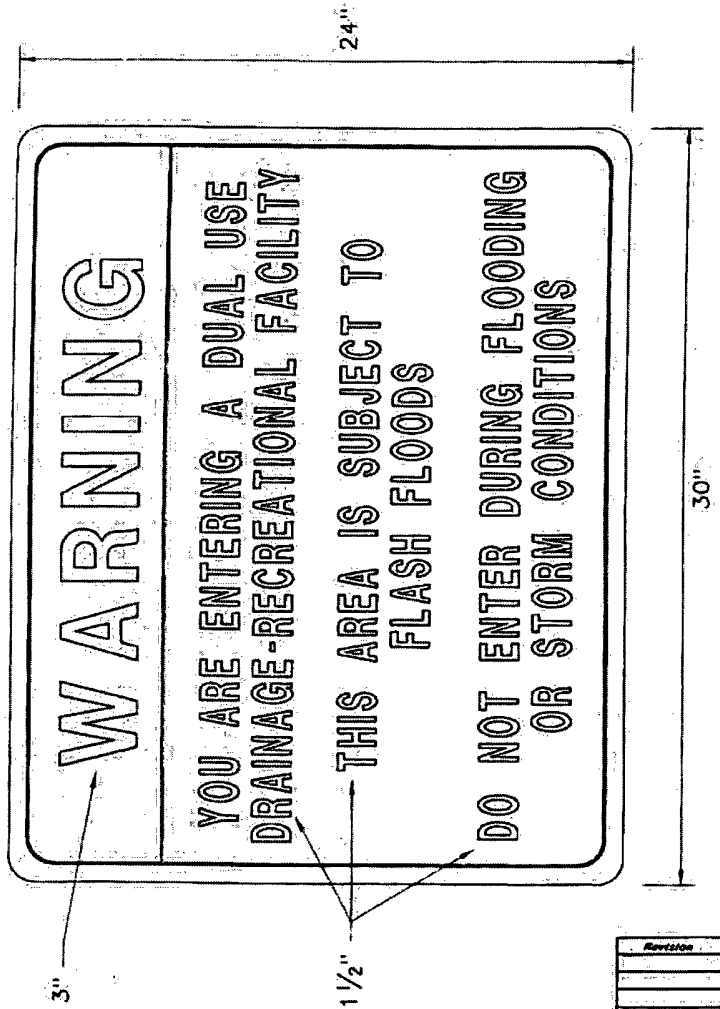
The courts have generally upheld the concept that drainage improvements are public purposes. A public drainage ditch has been held to be for a public purpose under eminent domain, and therefore required compensation for private property taken or damaged in the construction thereof. Eminent domain, 26 AmJur.2d Section 44. The courts quite generally have come to consider drainage district acts with favor as being for public purpose, whether exercised for the benefit of public health or for the reclamation or utilization of lands for agricultural purposes.

The Nevada Supreme Court specifically recognized the inverse condemnation theory in County of Clark v. Powers, supra. In that case the plaintiffs' properties were repeatedly flooded as a result of development activities of upstream developers. The court found the property no longer had a practical use other than as a flood control channel. The court noted in a footnote on page 501 of the decision as follows:

> "It has long been established that a taking occurs where real estate is actively invaded by superinduced additions of water...so as to effectively destroy or impair its usefulness" Pumpelly v. Green Bay Company, 80 U.S. (13 Wall.) 166, 181, (1871), and the result is no different when property is subjected to intermittent, but inevitable flooding which causes substantial injury, United States v. Cress, 243 U.S. 316, 328 (1917).

Thus, private property which is subject to intermittent but inevitable flooding can be "taken" as a result of governmental flood control projects. However, each of the cases is highly dependent upon its factual situation. Inverse condemnation liability extends to "just compensation" for the highest and best use of the property. The previously mentioned $50,000 damage limitation applies only to tort actions and does not apply to inverse condemnation actions. Additionally, the sovereign immunity defenses such as discretionary immunity and failure to inspect immunity are not available to the governmental entity because the right to just compensation for private property taken for a public use cannot be abridged or impaired by statute. Alper v. Clark County, 93 Nev. 569, 571 P.2d 810 (1977) cert. denied, 436 U.S. 905, 98 S.Ct. 2235, 56 L.Ed. 2d 402 (1978).

WARNING SIGN - DUAL USE FACILITY

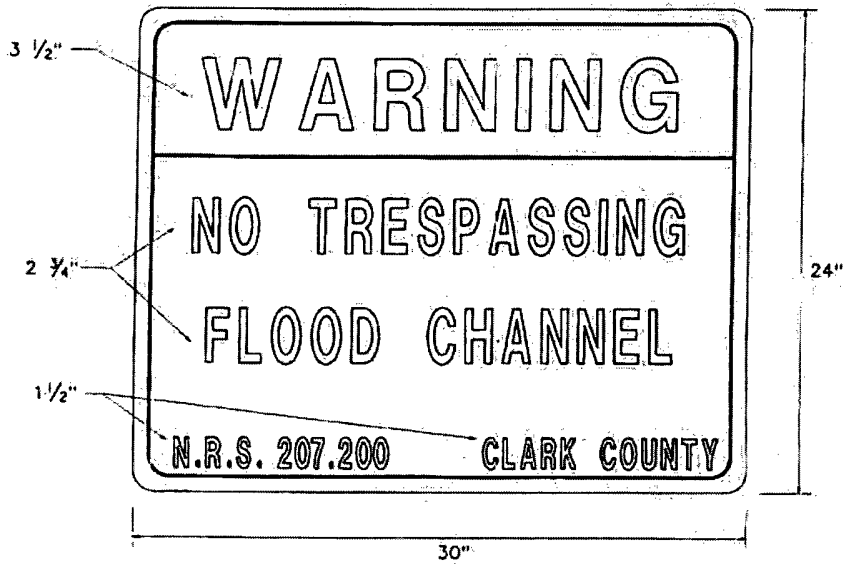


Revision	Date

REFERENCE:

FIGURE 401

WARNING SIGN - FLOOD CHANNEL



Revision	Date

REFERENCE:

FIGURE 402

Standard Review Form
Solar Millennium Draft Environmental Impact Statement for the Amargosa Farm Road Solar Energy Project

Reviewer's Name: Richard Nelson/Erika Balderson **Reviewer's Organization:** Nye County

Reviewer's email address: Richard@becnv.com **Reviewer's Telephone numbers:** 702-304-9830

Primary Disciplinary Area (e.g., ecology, land use planning, regulatory oversight): Oversight

Section or Chapter Number and Date of Reviewed Document: April 2010

	EIS Section	Page/Line	Comment/Suggested Revision	Action *(for use by BLM)*
Comment No. 19-01	ES-1.4.5	ES-15/ Table ES-1-4/ line 7-11	In the No Action Alternative for Air Quality and Climate, the statement "The No Action alternative, therefore, would not contribute to the State of Nevada's established Renewable Portfolio Standard goals," should be removed as this is not directly relevant to Air Quality.	
Comment No. 19-02	Acronyms and Abbreviations	xvi	Add "Ldn – Day Night Average Noise Level" (reference line 2, page 4-25).	
Comment No. 19-03	2.2	2-2/2	The section describes only three (3) alternatives: Dry cooling, wet cooling, and no action. Hybrid cooling should have been included as a fourth alternative in order to evaluate all possible impacts.	
Comment No. 19-04	2.3.2.4	2-19/paragraph 3, line 8	The paragraph cites the use of a gas-fired heater for supplemental heat when required, but does not cite the type of gas used, nor is there any pipeline or gas storage tank indicated on site diagrams (Figures 2-1 through 2-4.	
Comment No. 19-05	2.3.3.2	2-20/paragraph 1	The paragraph cites an HTF heater to be located in the power block, but does not indicate the type of gas to be used by the heater, or the storage point for that gas.	
Comment No. 19-06	2.3.3.3	2-21, Figure 2-6	Does not show provision for a gas pipeline or storage tank.	
Comment No. 19-07	2.3.6.3	2-27/ paragraph 2.	A description of the treatment and disposal of the precipitate or wastes	

Responses to these comments are provided on a separate page following this comment document.

		line 2	produced during reverse osmosis processes should be included.	
Comment No. 19-08	2.3.7	2-29/line 13	A statement should be included to describe the content and concentrations of contaminants precipitates contained in the Reverse Osmosis reject water being used for dust suppression.	
Comment No. 19-09	2.3.8	2-31/last paragraph of section 2.3.8/ last line	Discussion should include the maintenance and containment for each of the bioremediation facilities, during use and non-use periods.	
Comment No. 19-10	2.3.14	2-35/ paragraph 5, line 3	A description of the plan for the disposal of sediment should be included.	
Comment No. 19-11	Table 2-5	2-52/ Proposed Action Line 7	Change "... the proposed Project would generate..." to "... the proposed Project could generate..."	
Comment No. 19-12	Table 2-5	2-52/ Proposed Action Line 11	Change "... services within the ROI would total approximately..." to "...services within the ROI could total approximately ..."	
Comment No. 19-13	3.4.1.3	23-28 end of paragraph	Add: "The Nye County Water District Board has been created to oversee the qualitative and quantitative status of water resources available for use within the County."	
Comment No. 19-14	3.9.2.1	3-105/last paragraph/ line 2	Change "... Nevada's population will ..." to "... Nevada's population may ..." Referenced population trends (growth) do not reflect current County or Pahrump conditions. Recent estimates have indicated the population of Nevada may actually decline due to current economic conditions.	
Comment No. 19-15	4.4.1.2	4-23/ Waste Water Management, paragraph two/ line 6	Include the potential interactions between adjacent areas such as the bioremediation field, detention basins, and/or storm drainage outfalls, when the final location for the septic leach field is determined (see site map Figure 2-1).	
Comment No. 19-16	4.4.1.2	4-23/ Waste Water Management, paragraph five	Add an additional paragraph describing the contaminant content and concentrations of the reverse osmosis waste water and blowdown, and potential soil and groundwater impacts that will be used for dust suppressant (see Section 2.3.6.3, page 2-27).	
Comment No. 19-17	4.5	4-25 line 2	After "... Ldn" ad "(day night average noise level)".	
Comment No. 19-18	4.5.1.1	4-27	Enlarge decibel legend in this Figure to improve legibility.	

Responses to these comments are provided on a separate page following this comment document.

Comment No. 19-19	4.5.1.1	4-30	Enlarge decibel legend in this Figure to improve legibility.	
Comment No. 19-20	4.5.1.1	4-31	Enlarge decibel legend in this Figure to improve legibility.	
Comment No. 19-21	4.5.1.1	4-34	Enlarge decibel legend in this Figure to improve legibility.	
Comment No. 19-22	4.5.4	4-33/last paragraph/ line 2	Potential mitigation measures (section 4.5.4) should be included as they may be needed with noise values within 0.3 dBA of the EPA upper threshold limit.	
Comment No. 19-23	4.9.1.1	4-48/ Construction paragraph 3/ line 7	Describe the cumulative impact on multiple solar energy facilities drawing on the same construction resources (staffing).	
Comment No. 19-24	4.17.4	4-107/ additional bullet	The cumulative impact on multiple solar energy facilities drawing on the current construction resources (unemployed) should be described.	
Comment No. 19-25	5.2	5-3/after paragraph 2	Add paragraph: Nye County is currently negotiating a voluntary development agreement with the project proponent to mitigate direct impacts to roads, emergency services, etc."	
Comment No. 19-26	Appendix A.6	A-8	Add mitigation measures for wildlife where evaporative ponds are used (reference section 4.6.2.2, page 4-43). As evaporation takes place the concentration of chemicals/precipitates will increase. How will they be handled? Will precipitates be allowed to accumulate and possibly be carried to the ground water over a period of time?	
Comment No. 19-27	Appendix A.10	A-12	Add mitigation measures for wildlife where evaporative ponds are used (reference section 4.6.2.2, page 4-43). As evaporation takes place the concentration of chemicals/precipitates will increase. Identify disposition methods for the contaminants/precipitates in pond areas to avoid possible infiltration into the ground water over a period of time. Identify methods to avoid further contamination in the event of flooding in evaporative pond areas.	
Comment No. 19-28	Appendix A.10	A-12	Identify how evaporative pond and detention basin evaporates and precipitates will be disposed of during decommissioning and remediation of the project site.	
Comment No. 19-29	Appendix A.10	A-12	Add measures to monitor storm water drainage outfall areas and detention basins for potential contaminants/precipitates from the project site to ensure there is no buildup of salts, selenium, etc. Identify thresholds and mitigation measures to be taken if contamination or precipitate buildup is noted.	

Responses to these comments are provided on a separate page following this comment document.

To add addition boxes, press tab.

RESPONSES TO COMMENT NO. 19-01 THROUGH 19-29

Response to Comment No. 19-01

At the request of the commenter, the statement has been removed.

Response to Comment No. 19-02

Ldn is defined in section 3.5.1 and added to the table of acronyms and abbreviations.

Response to Comment No. 19-03

In late 2010, the first hybrid solar facility is expected to come online in Martin County, Florida. Although this new technology is promising, solar thermal parabolic trough technology using either wet- or-dry cooling has a well-proven track record for successful operation throughout the world. Hybrid cooling uses a combination of a smaller air cooled condenser coupled with a wet cooled condenser. Depending upon the respective sizes selected for the wet and dry cooled condensers, the system would offer a hybrid of the advantages of each. Specifically, the wet cooled condenser section would improve performance during high ambient temperatures and the air cooled condenser will conserve water use. The major disadvantage of the hybrid cooling system is that it increases cooling system complexity and overall system costs. Therefore, the hybrid cooling systems have not been commonly used in power plants of this size range. For this reason, hybrid cooling was not evaluated as an alternative. In addition, because the wet- and dry-cooled alternatives are so different, they provide for a robust analysis and comparison of effects, as each alternative has different advantages.

See also response to comment 16-05.

Response to Comment No. 19-04

As stated in Section 2.3.4 (Fuel Supply and Use) - The auxiliary boiler and HTF heaters will be fueled by propane. Propane will be delivered to the plant site via truck from a local distributor and stored in 18,000-gallon aboveground tanks (one in each power block). The estimated propane usage for the auxiliary boiler per unit for normal operation is approximately 9 MMBtu/hr overnight and approximately 34 MMBtu/hr for 30 minutes during startup each morning. The estimated maximum propane usage for the HTF heater is an additional 41 MMBtu/hr per unit is for approximately 50 hours per year during the winter.

Response to Comment No. 19-05

See response to Comment No. 19-04

Response to Comment No. 19-06

See response to Comment No. 19-04. Propane will be stored in 18,000-gallon aboveground tanks (one in each power block).

Response to Comment No. 19-07

This information is provided in section 2.3.5.2 in the FEIS.

Response to Comment No. 19-08

This information is provided in section 2.3.5.2 in the FEIS.

Response to Comment No. 19-09

This information is provided in section 2.3.5.2 in the FEIS.

Response to Comment No. 19-10

Sediment control will be addressed in the site-specific Stormwater Pollution Prevention Plan to be developed prior to construction.

Response to Comment No. 19-11

Edited sentence per commenter's request.

Response to Comment No. 19-12

Edited sentence per commenter's request.

Response to Comment No. 19-13

At the request of the commenter, information has been added to the FEIS in Section 3.4.1.3.

Response to Comment No. 19-14

The paragraph in question is no longer in the FEIS.

Response to Comment No. 19-15

The precise location of the bioremediation field, detention basins and/or stormwater drainage outfalls, and septic leach field has not been finalized. The EIS considers that these project components would be constructed and operated in compliance with all federal, state, and local laws and regulations. Specific detail about the function of each of these components is provided in Chapter 2.

Response to Comment No. 19-16

This information is provided in section 2.3.5.2 in the FEIS.

Response to Comment No. 19-17

Ldn is defined in section 3.5.1 and added to the table of acronyms and abbreviations.

Response to Comment No. 19-18

The requested edits have been made in the FEIS.

Response to Comment No. 19-19

The requested edits have been made in the FEIS.

Response to Comment No. 19-20

The requested edits have been made in the FEIS.

Response to Comment No. 19-21

The requested edits have been made in the FEIS.

Response to Comment No. 19-22

The noise model calculations show that, during Project operation, the EPA threshold of 55 dBA will not be exceeded. Therefore potential noise mitigation measures will not be necessary.

Response to Comment No. 19-23

See section 4.17.5.10 for a discussion of cumulative impacts to the labor force.

Response to Comment No. 19-24

See section 4.17.5.10 for a discussion of cumulative impacts to the labor force.

Response to Comment No. 19-25

Please refer to the Development Agreement available in Appendix F.

Response to Comment No. 19-26

The BLM preferred alternative is the Proposed Action (dry-cooled alternative). See Section 1.9 regarding the addition of evaporation ponds to manage industrial wastewater flow. Mitigation measures to protect wildlife species are provided in Appendix A-6.

Response to Comment No. 19-27

See response to Comment No. 19-26.

Response to Comment No. 19-28

See response to Comment No. 19-26.

Response to Comment No. 19-29

Monitoring and compliance are requirements of the NDEP NDPES Stormwater Discharge Permit and are expected to be integrated into the detention/retention basin designs.

April 30, 2010

To: BLM Pahrump Field Office,
Attention: Gregory Helseth,
4701 North Torrey Pines Drive,
Las Vegas, NV 89130-2301
solar_millennium@blm.gov

Subject: We would like to submit these comments on the Draft Environmental Impact Statement for the Solar Millennium Amargosa Farm Road Project, Bureau of Land Management [LLNVSO3100 L5101000.ER0000 LVRWF09F8590 241A; 10–08807; MO#4500012002; TAS: 14X5017] Notice of Availability of the Draft Environmental Impact Statement for the Solar Millennium Amargosa Farm Road Solar Power Project, Nye County, NV

Basin and Range Watch is a group of volunteers who live in the deserts of Nevada and California, working to stop the destruction of our desert homeland. Industrial renewable energy companies are seeking to develop millions of acres of unspoiled habitat in our region. Our goal is to identify the problems of energy sprawl and find solutions that will preserve our natural ecosystems and open space.

Comment No. 20-01 **Deadline for DEIS Comments:** Due to the outstanding unresolved issues that this project has instigated, we would like to request that the scoping deadline be extended into the end of June, 2010.

Comment No. 20-02 **Fast Tracking Deadlines :** Although we understand that BLM is under considerable political pressure to develop renewable energy, we believe it is unwise for the BLM to be using "fast tracking" seemingly to expedite approval of this project. We feel that it there are enough outstanding unresolved issues that make approval and construction of facilities by November of 2010 under the American Recovery and Reinvestment Act a very unrealistic goal. This process has lead to an unreasonably rushed schedule that has the potential to have long term impacts on natural resources and overlooks the many concerns that public and adjacent private land owners have raised. The rushed schedule has resulted in a distrust and lack of faith in the ability of our public land agencies and elected officials to actually develop renewable energy in a way that could be sustainable for the future. Furthermore, the fast tracking undermines laws established under the National Environmental Policy Act that have been enacted to insure that resources on public lands are managed soundly for future generations..

Comment No. 20-03 **Purpose and Need:** Although it is not the job of the BLM to list private land alternatives, we do not believe that this project is the best possible management option for the public lands of the region. Many renewable project developers have failed to consider reasonable or viable alternatives that could serve as solutions that everybody could live with. In the case of this particular project, conflicts with private property owners, cultural resources, storm water drainage erosion, endangered species, biological resources, view-scapes from National Parks and wilderness areas could all be avoided with a distributed generation alternative.

Comment No. 20-04 There exist many high-risk problems and assumptions associated with the project design, which is being supported on public land and with taxpayer subsidies. Distributed generation should be given much more full analysis, as it is a completely viable alternative. The project will need just as much dispatchable baseload behind it, and also does not have storage. But environmental costs are negligible with distributed generation, compared with the project. Distributed generation cannot be "done overnight," but neither can large transmission lines across hundreds of miles from remote

Responses to these comments are provided on a separate page following this comment document.

Comment No. 20-04 (continued)

central station plants to load centers. Most importantly, distributed generation will not reduce the natural carbon-storing ability of healthy desert ecosystems, will not disturb biological soil crusts, and will not degrade and fragment habitats of protected, sensitive, and rare species.
Alternatives should be looked at that are in load centers, not closest to the project site. There is a need to consider the "macro" picture, the entire state, to look at maximum efficiency.

Comment No. 20-05

A Master comprehensive plan should exist before large expensive inefficient solar plants are sited and built out in the wildlands. This plan should carefully analyze the recreational and biodiversity resources of the public lands desert. A list of assumptions should be included detailing the plan for integrating various fuels mixes and technologies into each utility's plan, an overall state plan, and a national plan. Loads should be carefully analyzed to determine whether additional capacity is needed for peaking, intermediate, or baseload purposes. Unit size, which impacts capital and operating costs and unit capacity factors, has a direct bearing on the relative economics of one technology over another. A plan might recommend that smaller units built in cities and spaced in time offer a less risky solution than one large unit built immediately.

Right now there is no utility plan, no state plan, and no national plan. Large-scale central station solar plants have been sited very far from load centers out in remote deserts, with the only criterion being nearness to existing transmission lines and natural gas lines. Very little thought has been given to the richness of biological resources, the cumulative impacts on visual scenery to tourists, the proximity to ratepayers, or the level of disturbance of the site.

There will be a need to build many new efficient natural gas peaker or baseload plants to back up the renewables planned. Instead, the renewables should be distributed generation in load centers, which will provide much more efficiency, rather than inefficient remote central station plants that reduce biodiversity and require expensive transmission lines. This reduces the risk, as distributed generation is a known technology and has been proven in countries like Germany where incentive programs have been tested. Incentive programs can be designed in an intelligent manner to vastly increase distributed generation. Incentives for large remote projects like Amargosa Farm Road Project are not proven to lower risk and may actually raise debt levels with runaway costs associated with poor siting and higher-than-anticipated operating and maintenance costs.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 20-06

Project Right of Way: The Right of Way is close to 8,000 acres (7,800), but the project is only 4,000 acres. Are there plans to expand the project?

Comment No. 20-07

Land Use: The project area is located mostly on public lands. Will the project site be designed to have access corridors going through it? What kind of "mitigation" would be provided to compensate for disruption of access? Has this been considered? The Bureau of Land Management's multiple use philosophy simply can not be met if so many acres are going to be sacrificed for only one use. Plans to convert so much public land use to energy use only violates BLM's multiple use philosophy.

Comment No. 20-08

Proposed Action and Alternatives: The only alternatives listed are the Dry Cooled Alternative, the No Action Alternative and the Wet Cooled Alternative. Solar Millennium originally proposed wet cooled as their preferred alternative. In early November, 2009, long before the release of this DEIS, Solar Millennium announced that their preferred alternative would be dry cooled, mainly because the overdrawn water resources of Amargosa Valley would not feasibly allow for the use of so much water. The justification for not choosing an alternative further away from the community of Amargosa Valley is a weak. The DEIS claims that all the other BLM land is claimed by other existing solar applications. At a recent public meeting for Solar Millennium in Las Vegas in Beatty, Nevada, BLM personnel informed us that they were about to cancel applications from both Abengoa and Cogentrix. In total, it

Comment No. 20-09 (continued)

was implied that several thousand acres could be considered as alternatives for this project, just based on applications that BLM has been planning to cancel. Given the outstanding conflicts between local people concerning their community, we feel that BLM needs to provide a viable alternative to this project besides the No Action Alternative and the improbable Wet Cooled Alternative.

Comment No. 20-09

Another alternative to consider would be one that uses a different technology such as a heating system that uses steam over hazardous materials such as Therminol.

Comment No. 20-10

The Anvil Road Alternative was eliminated as well as an alternative to only develop a single 232 megawatt plant because "a single 250 MW plant would not be as effective in meeting the project objective of supporting attainment of renewable energy mandates and objectives." This statement is very inconsistent with Solar Millennium's plan to build a 250 MW plant near Ridgecrest, California. The EIS has not justified rejecting a smaller plant alternative adequately.

Comment No. 20-11

In Section 2.3.3.3., concerning thermal energy storage, the molten salt systems are said to support "approximately 4.5 full load equivalent hours of electric energy after sundown and on cloudy days." This estimate does not factor in winter day length and temperature. A better analysis that factors in these variables will be needed to help us determine how efficient this technology would be on a year round basis.

Hazardous Materials: Page 4-97, 98 says detection of large leaks is being proposed by using remote pressure sensing equipment and remote operating valves. Details of the design will be developed in the design detail process. This is unacceptable, as HTF fires from leaks is one of the primary concerns of having the facility so close to town. A plan needs to be developed now for public review. There are many unanswered questions: Will each loop in the solar field be isolated by a valve to close it off in case of fire? Would manual control be better than remote because of issues of wiring failure in such a large facility? Can valves be made to close automatically with a spring control after reaching a certain temperature, as is being proposed for the Solar Millennium Ridgecrest project in California? Has the applicant made an agreement with Nye County for fire and emergency response coordination? How many million gallons of Therminol will be on site? Will a Devlopment Impact Fee be paid to the county? Are HazMat response teams available in case of an explosion? Would the Fire Department be able to respond to two fires at two solar facilities simultaneously in the cumulative build-out scenario? A Fire Needs Assessment and Emergency Needs Assessment should be carried out and made available for public review before the final EIS.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 20-12

An assessment of how many gallons of HTF will be allowed to spill , such as 600 gallons at a time. A Hazard Operations analysis should be undertaken. How long will it take to burn 600 gallons or 1200 gallons of HTF in a spill? Will the fire be of long duration so that it could spread? Or would the fire only burn for 15 minutes, for example, and burn out quickly?

Comment No. 20-13

Cumulative impacts should be considered very significant if even a few solar thermal projects are developed in Amargosa valley. In a recent workshop with the California Energy Commission and Bureau of Land Management with Solar Millennium Blythe and Palen projects, which share similar design features to the Amargosa project (Riverside County, California, April 24, 2020), recommendations were made that the applicant needs to enter negotiations with the county for adding capital improvements to the Fire, Emergency Response, and HazMat facilities. Specifically, the applicant would be asked to contribute towards a new fire station and two new engines to the county, and ongoing operations and maintenance fees. A sum of $350,000 first fee and $100,000 annual fee would be negotiated between the first solar project constructed and the county, and after

Comment No. 20-13 (continued)

that each new solar project to come online would contribute, and a rebate given to the first project, so that every power plant contributes.

Comment No. 20-14

Solar projects will have direct significant impacts to the county ability to respond to fire and emergency, as two responders should be able to respond from different parts of the county, and these may be from a long distance away.

In addition, solar power plants should have annual fire and emergency training annually with the fire department.

Nevertheless, we still consider the location of the solar fields of the Amargosa project to be too close to residents. HTF leaks and fires, and in the worst case scenario, explosions, mean that the project should be farther away from the town of Amargosa Valley.

Comment No. 20-15

An addition safety hazard for the public is the large number of truck traffic potentially passing by the school on Amargosa Farm Road during operations, with weekly delivery of propane and other materials.

Comment No. 20-16

Security concerns need to be addressed. Will closed-circuit TV cameras be installed on the perimeter fence and powerblock? Will cyber-security be assessed for cyber-attacks, following Homeland Security guidelines?

Comment No. 20-17

Water Resources: Even though Solar Millennium has made the commitment to go dry cooled, they are still going to need over 400 acre feet of water to maintain this facility. They are proposing to change the water use from "Agricultural" to "Industrial." Water is designated "Agricultural." Although Solar Millennium has identified an existing water right that they plan on leasing, all of this water still lies within the designated Agricultural Farm District. Changing the use to Industrial is a violation of Nevada water law.
From Nevada State Order 1197:

WHEREAS, *an administrative hearing was held on September 5-6, 2007, I where evidence and testimony was received regarding the potential impacts of regional pumping on existing rights, particularly the federally reserved water right at Devils Hole? The federally reserved water right specifies a threshold water level at Devils Hole. Information provided at the hearing show the water level in Devils Hole is only 0.6 to 0.7 feet above the threshold level mandated by the U.S. District Court; 3.*

Responses to these comments are provided on a separate page following this comment document.

Comment No. 20-18

The Amargosa Valley water resources are already over appropriated by approximately 17,000 acre feet. We are concerned that water conservation laws established under the State Engineer's office would be undermined in the Amargosa Farm District. This could set a precedent regarding the potential future cumulative impacts from the political demand to turn the Amargosa Valley into an experimental renewable energy industrial zone.

Comment No. 20-19

At the public meeting held in Beatty, Nevada in April, 2010, BLM personnel informed us that the State Engineer, the National Park Service, the Nevada Division of Wildlife and the US Fish and Wildlife Service have all been in private meetings developing a solution that would allow Solar Millennium to

Comment No. 20-19 (continued)

use this water for industrial use. We were told that the conflicts of changing the use from agricultural to industrial could be worked out by either retiring another water right or "injecting" water back into the aquifer. Many water injecting projects fail, often not reaching the aquifer. We did attempt to verify this information with one of the Nevada State Engineers. The individual that we talked to in the State Engineer's office informed us that no agreements or solutions have been reached between the agencies.

Comment No. 20-20

A cumulative analysis of water withdrawal from all proposed regional energy projects should be provided in the final EIS. How would these projects impact Ash Meadows National Wildlife Refuge, the Amargosa Wild and Scenic River and Death Valley National Park? How would the cumulative water impacts effect local residents of Amargosa Valley and communities "down-stream" from the Amargosa Valley?

Stormwater and Erosion Management

Comment No. 20-21

We suggest reconfiguring the project around Forty-mile Wash, as this wash has had very large historic flows, as recently as 1998, which could cause major damage to the solar field. A small cement-lined channel will likely not contain large flash floods. Even smaller floods could gradually scour and destroy a concrete lined channel. Concrete channels may work to contain small washes, but not a large wash such as Forty-mile Wash, as indicated by floods damaging Highway 95.

A regional detention basin north of Highway 95 in Forty-mile Wash has been proposed, but may be years off and will need a separate environmental review. How does the applicant propose to protect the solar field and powerblock from strong floods without this? Spills of HTF could be an issue during flooding. Therefore a Stormwater Pollution Prevention Plan needs to be developed now for public review, not later.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 20-22

Greenhouse gases: Plans to build a new 250 KV transmission line to Johnnie and upgrade existing transmission will add more SF6 gases to the atmosphere. The green house gas called SF6 is used primarily in electricity transmission - and is emitted in especially large amounts in construction of new lines – and is 24,000 times as potent as CO2 in it's global warming impacts. The Environmental Protection Agency has declared "that the electric power industry uses roughly 80% of all SF6 produced worldwide". Ideally, none of this gas would be emitted into the atmosphere. In reality significant leaks occur from aging equipment, and gas losses occur during equipment maintenance and servicing. With a global warming potential 23,900 times greater than CO2 and an atmospheric life of 3,200, one pound of SF6 has the same global warming impact of 11 tons of CO2. In 2002, U.S. SF6 emissions from the electric power industry were estimated to be 14.9 Tg CO2 Eq. ...
http://www.epa.gov/electricpower-sf6/basic.html
Please provide a detailed analysis of the amount of SF6 gases that would be released by this project.

Comment No. 20-23

Carbon sink: Scientific studies have revealed that desert ecosystems and minerals have the ability to store C02 gases. Have Desert Researchers Discovered a Hidden Loop in the Carbon Cycle? Richard Stone: Science 13 June 2008: Vol. 320. no. 5882, pp. 1409 - 1410 DOI: 10.1126/science.320.5882.1409.

Comment No. 20-23 (continued)

How much C02 storage capability would be replaced by development? If the goal is indeed to reduce greenhouse gases, is it wise to remove this much carbon storing ecosystem? Please provide a detailed analysis on the amount of GHG that would otherwise be offset by an intact arid ecosystem.

Comment No. 20-24

Air Quality: Dust issues for the community of Amargosa Valley have not been resolved. From the amount of land that will be graded, any time there are windy days, the dust will be kicked up. Dust plumes during construction could seriously compromised the air quality of the park during high wind events.

Biological Resources:

Comment No. 20-25

The applicant's biological data only represents one drier than normal season for their biological surveys. The spring of 2009 was not a good representative year for surveying biological resources. The Amargosa Valley has similar rainfall totals to the West Mojave Desert. Any projects that are proposed for the West Mojave are usually required to have at least two surveys on different years to get an objective view of an area's biological diversity as some years are dry and more dormant than others. The BLM has made a great mistake by only requiring the applicant to conduct one survey. As it turns out, the project site received 3.65 inches from November, 2009 to April 2010 with most of the rain falling in January and February of 2010. That is nearly the rainfall total for an entire year. We would like to request more biological surveys. Even the best biologist will not be able to provide complete data based on one poor survey season.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 20-26

Desert Tortoise: The project occurs in desert tortoise (*Gopherus agassizii*) habitat. On three visits to the project site, we saw active tortoise burrows. Although not of great density, this sign indicates a tortoise population inhabits the site, and should be considered. Connectivity issues are also a concern, with cumulative impacts to tortoise habitat in Amargosa Valley from numerous renewable energy projects potentially affecting gene flow to the north in the tortoise populations of the Beatty and Bullfrog Hills region. Loss of food plants in the habitat are also of concern. The DEIS implies that the tortoise has been extirpated from the project area based on failure to detect tortoises on site in the spring of 2009. But one presence-absence survey cannot be used to estimate tortoise density. No protocols for the monitoring were provided. Qualifications of tortoise biologists need to be given.

We would like to know why desert tortoise surveys were only conducted during the spring of 2009. As both the BLM and the applicant are aware, the spring, 2010 season was far more representative of what could be considered a good year regarding precipitation totals. We have included photos of the habitat.

Comment No. 20-27

We are also very concerned with the claims by Tierra Biological Consulting that the area contains no annual vegetation. The dry condition of Amargosa Valley appears to be caused by the "rain shadow" effect of the Sierra Nevada as well as the Funeral Mountains, located in California, and situated due west of the project site. Rainfall and climatic data can be found in Section 1.3.2.

The Mojave Desert does not produce consistent rain and a bumper annual bloom every year. To only do one survey on a very dry year and conclude that the region has low biodiversity is misleading. A healthy desert tortoise population does not always occur in an area that has equally high plant density. This is why many animals have large home ranges. In the case of this report, only one survey was conducted on a dry year. Had the survey been conducted in 2010 by competent biologists, the conclusion on annual plant density would have been much more positive. It makes little sense to conclude low annual biodiversity in the Mojave Desert based on one dry season.

Comment No. 20-28

The following quotes concerning desert tortoise come from the Tierra Data Biological Report, 2009 with our responses below:

Comment No. 20-28 (continued)

"A small desert tortoise population is known to exist to the North of the project site around Beatty, NV. Desert tortoise surveys conducted in 2006 (Knight and Leavitt 2006) and in 2007 (Converse Consultants 2008) for proposed mining operations, indicate population densities of 0-9.99 tortoise per square mile. It should also be noted that the lead tortoise biologist for this project was the BLM Manager for public lands surrounding Beatty, NV and has extensive knowledge of this tortoise population. This experience can confirm the low density of this Population." (Tierra Data Biological Report, 2009)

There are tortoise populations located from the region of Amargosa Valley to the Bullfrog Hills near Beatty, NV. It is misleading to imply that there is only one small tortoise population near Beatty, Nevada. In reality, the area supports tortoise habitat continuously, and populations are spotty, at best. Furthermore, tortoise populations can be found on south facing slopes to the community of Scotty's Junction. It is not scientific to assume that habitat quality and tortoise density are the same thing.

Comment No. 20-29

"To the northeast of the project site, lies the Department of Energy, Nevada Test Site. This area has been extensively surveyed for tortoise over many years (Rautenstrauch and O'Farrell, 1991). These surveys also indicate a low to very low density of tortoise." (ibid.)

This is also a misleading statement. Anyone can reference the biological survey reports for the Nevada Test Site and surrounding military property. The populations of tortoise vary in size and density over the larger land area comprised in the Nevada Test Site. It is a very large area. To claim that the whole site has a low to very low density is unscientific.

Comment No. 20-30

"In addition to these harsh environmental conditions, the project shows heavy anthropological disturbance. As was previously discussed, almost the entire project is encompassed by roads. The roads transect the site from North to South and East to West on almost all section lines. In addition, several roads cross the area at various angles. The Northeast corner of the project has a road/trail system that is used for competitive off-road racing events. This off-road racing event course has been widened over years of racing to well over 200 feet in some areas." (ibid.)

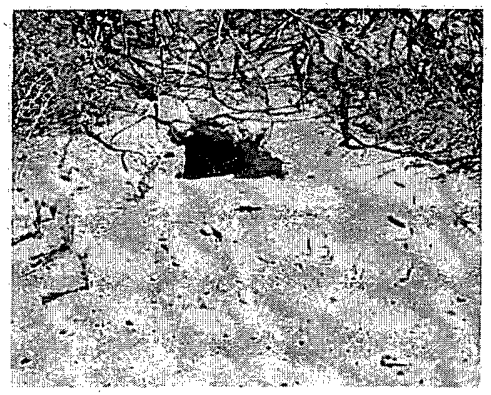
Another very misleading comment. We have walked the site seven times. Vehicle disturbance is limited to about 30 percent of the site. This disturbance is in the form of light tire tracks. Clearly the biologists have exaggerated the facts.

Comment No. 20-31

"Upon completion of over two months of desert tortoise surveys, conducted during the months of late March and all of April and May, only four Class 4 burrows were observed. These months are considered the months of highest tortoise activities. No dead or live tortoises were observed. As was previously discussed, no shells, scutes or bone segments of dead tortoise were detected in wash areas or where water ponds during high water events. Generally, if no other tortoise sign is detected during survey activities, tortoise remains can be found in washes." (ibid.)

Below is a photo of an active desert tortoise burrow that we found on the site on April 26th, 2010.

Responses to these comments are provided on a separate page following this comment document.



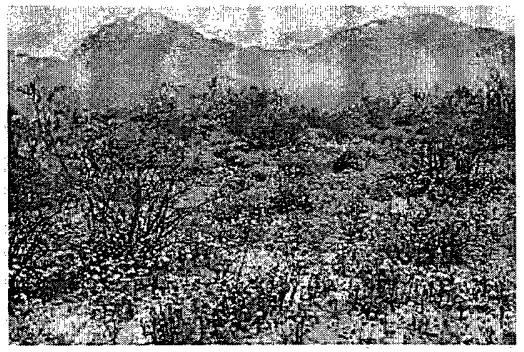
Comment No. 20-31 (continued)

The GPS coordinates are: NAD27, UTM zone 11, e-542777, n-4047023.

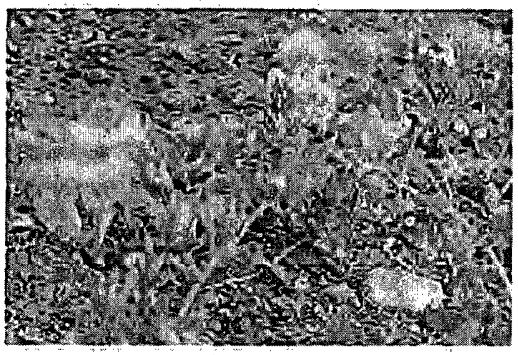
Approximate location of tortoise burrow on Solar Millennium project site, north of Amargosa Farm Rod, near Casada Rd.

Desert tortoise populations on the edges of the range can represent "fringe populations" that can be important for maintaining species survival in the event of core population declines. Since the survey data is so incomplete, we would first like to request another field survey season for the desert tortoise. We would also like to see a Biological Assessment, a Translocation/Relocation Plan and a one to one mitigation strategy.

A response to this comment is provided on a separate page following this comment document.



Pincushion flowers (*Chaenactis* sp.) Spring, 2010



Golden evening primrose (*Camissonia brevipes*)

Comment No. 20-32

Other Wildlife:

Quotes from the Tierra Data Biological Report, 2009 with our responses below:

"Nearly 40 percent of the project site is dominated solely by creosote (Photo 3-3), and while some other shrubs such as burrobush or saltbush do occur they are very minor components. Other than shrubs, there is very little vegetation cover. What little there is consists primarily of very sparse Mediterranean grass and goldfield, confined almost exclusively under shrub canopies. In the ground space between shrubs there is little to no herbaceous growth aside from Cryptantha and spineflower (Photo 3-4), which in some areas is present in relatively high numbers (although in well-dispersed patches of perhaps 10+ plants/m2). Also notable are scattered dense patches of flat-topped buckwheat, which primarily occur in this vegetation type. Observable wildlife was also scarce in the creosote, where sightings of lizards, numerous elsewhere on the project site, were very rare."

This seems to be a consistent problem with the biological data that has been submitted for this project. The lizard fauna we observed on the site was abundant in April, 2010. Clearly the biologists should be required to survey during a season which would provide them with more accurate numbers.

Desert Iguana *(Dipsosaurus dorsalus):*

Our April 2010 site visit found this species to be abundant on the site.

Sand flow for Dune Endemics:

Comment No. 20-33

The project would be sited in close proximity to the Big Dune Area of Critical Environmental Concern. The project would consist of over 4,000 acres with a Right of Way of over 7,000 acres. The DEIS has no information on how such a large development project would effect the distribution of Aeolian (wind deposited) sand. Big Dune sand deposits are related to local wind patterns and the geological deposits of the Amargosa River. The DEIS fails to analyze the potential direct and cumulative effects of sand flow obstruction that may have long term impacts on endemic plants and insects. The four endemic beetles from the Big Dune Area of Critical Environmental Concern are dependent on Aeolian sand deposits.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 20-33 (continued)

The four species of endemic beetles: Giuliani's big dune scarab beetle (*Pseudocotalpa giulianii*) was proposed for listing as a threatened species under the Endangered Species Act in August 1978. In addition, the entire Big Dune Complex was proposed as critical habitat for the species. Off-road vehicle use was identified as the largest threat to the species at the time. It has also recently been proposed for listing by the Wild Earth Guardians in January of 2010.

Three other rare and sensitive beetle species can also be found at Big Dune: Large Aegialian Scarab Beetle (*Aegialia magnifica*), Rulien's miloderes weevil (*Miloderes rulieni*), Big Dune aphodius scarab beetle (*Aphodius* sp.).

Comment No. 20-34

Please provide a geologic map that explains where the source(s) of sand for the Big Dune complex originate.

Burrowing Owl: (*Athene cunicularia*)

Comment No. 20-35

The DEIS fails to explain what survey methodology, if any, was used to detect burrowing owls and sign. Indicate whether burrowing owl surveys were conducted using recommended protocols (Burrowing Owl Survey Protocol and Mitigation Guidelines. 1993. Prepared by the California Burrowing Owl Consortium. www.dfg.ca.gov/wildlife/nongame/docs/boconsortium.pdf, accessed November 10, 2009). Were surveys carried out during the hours around sunrise and/or sunset, or were owls detected incidental to other survey efforts? The DEIS does not provided quantitative evidence on how densely populated with burrowing owls the project site is. The burrowing owl guidelines (ibid.:i) emphasizes "maintaining burrowing owls and their resources in place rather than minimizing impacts through displacement or owls to an alternate site."

We disagree with the DEIS (page 3-97) that the project site is poor habitat for burrowing owls and not suitable for breeding in the desert areas. We have seen burrowing owls in the area during spring and summer several times within a few miles of the project area in open Mojave Desert scrub similar to the project site. During the spring of 2010 wildflowers were abundant, and insects as well as abundant kangaroo rat (Dipodomys spp.) burrows were seen by us on the project site. This appears to be a good food base for breeding burrowing owls.

Passive relocation should be used before construction begins, as recommended by the guidelines.

The CDFG burrowing owl guidelines (ibid.:10) recommends that for off-site mitigation, replacement of occupied habitat with 9.75 acres of occupied habitat per pair or single owl found, or 13 acres of contiguous habitat per pair or single bird, or 19.5 acres of unoccupied habitat per pair or single bird. The FSA/DEIS has not discussion of this or whether any future plan will undertake these recommendations. Please address this.

Comment No. 20-36

Bald Eagle and Golden Eagle: We have observed Golden Eagle nests in the Bare Mountains. The DEIS states that there will be no impacts to golden eagles, but the project will permanently remove over 4,000 acres of foraging habitat for this species.

Comment No. 20-37

Bats: Six species of bats occur on the site. Please explain potential impacts of collision with hot components of the power plant during dusk. Since heat would be retained for a few hours after sunset, would this effect bat species?

Comment No. 20-38

Rare Plants: The Tierra Biological Survey Report continuously states that the year of their survey

Responses to these comments are provided on a separate page following this comment document.

Comment No. 20-38 (continued)

was exceedingly dry and that survey conditions were not optimal for finding rare plants. We would like to request that at least two additional surveys be conducted concerning the botanical resources on the site. We were surprised that the BLM did not take advantage of the abundant rainfall this year and require Solar Millennium to survey for biological resources. We would like to request one additional survey for the spring season and one for the fall. Many annual plants in the Mojave Desert bloom exclusively in the fall months. You simply cannot make an accurate botanical survey without fall surveys.

The DEIS leaves out many potential rare plants that could be on the project site. Surveys should be carried out in wet years such as 2010, not during dry periods.

We did a thorough search of the Nevada Natural Heritage database and found the project has the potential to disturb the following rare plants that could occur in the Amargosa Valley:

Arabis shockleyi Shockley rockcress
Astragalus beatleyae Beatley milkvetch
Astragalus funereus black woollypod
Astragalus serenoi var. *sordescens* squalid milkvetch
Calochortus striatus alkali mariposa lily
Castilleja martinii var. *clokeyi* Clokey paintbrush
Camissonia megalantha Cane Spring suncup
Centaurium namophilum spring-loving centaury
Cordylanthus tecopensis Tecopa birdsbeak
Cryptantha tumulosa New York Mountains *catseye*
Cymopterus ripleyi var. *ripleyi* Ripley biscuitroot
Cymopterus ripleyi var. *saniculoides* sanicle biscuitroot
Entosthodon planoconvexus planoconvex entosthodon
Eriogonum concinnum Darin buckwheat
Eriogonum contiguum Amargosa buckwheat
Gilia nyensis Nye gilia
Gilia ripleyi Ripley gilia
Hulsea vestita ssp. *inyoensis* Inyo hulsea
Ivesia arizonica var. *saxosa* rock purpusia
Lathyrus hitchcockianus Bullfrog Hills sweetpea
Penstemon albomarginatus white-margined beardtongue
Penstemon arenarius Nevada dune beardtongue
Penstemon fruticiformis ssp. *amargosae* Death Valley beardtongue
Penstemon pahutensis Pahute Mesa beardtongue
Perityle intricata delicate rockdaisy
Phacelia beatleyae Beatley scorpion plant
Phacelia mustelina weasel phacelia
Sclerocactus polyancistrus hermit cactus

Most of these plants are either recognized as rare by the state of Nevada, or Species of Special Concern by the U.S. Fish and Wildlife service and the Bureau of Land Management. Please include this information in the final EIS.

Comment No. 20-39

Weed Removal and Control: What herbicides would be used to remove vegetation from the solar project? How will these toxins be prevented from getting into the ground and ground water ? What effects, short term and long term would the use of these chemicals have on public health? Will local land owners be at risk? How will these herbicides effect sensitive wildlife and plants? Hundreds of

Responses to these comments are provided on a separate page following this comment document.

Comment No. 20-39 (continued)

miles of small roads will be constructed. That has the potential to create a serious weed problem in the area.

Comment No. 20-40

Vegetation Removal: How will vegetation be removed? Will it be bladed by large scrapers? How will vegetation be kept off of the site?

Comment No. 20-41

Visual Resources: The DEIS has not provided enough details on the visual impacts that this project would cause.

Contrast level should be evaluated based on seasonal sun angle. There needs to be an additional analysis relating to the four seasons of sun angles.

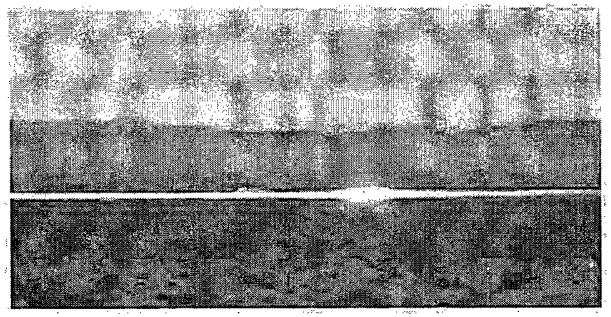
Comment No. 20-42

There are no night lighting KOP's. Night-time glare and lighting is an issue that has been raised by local residents and the National Park Service. Solar Millennium did provide some night time KOP's to the California Energy Commission concerning their proposal for a similar facility near Ridgecrest, California. We are disappointed that the BLM did not take the time to think about this. We would like to request night-time KOP's representing residential areas, views for roads and views from Death Valley National Park. There should be at least 5 night lighting KOP's ranging from above views to ground level. There is also very little description of the night lighting visual impacts to the area. How much security lighting will be needed? How will that impact private residents? How will that impact neighboring Death Valley National Park? Will light be shielded? Will there be OSHA requirements for non-shielded lighting.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 20-43

There are no KOP's simulating glare. Depending on time of day and time of year, "flash-glare" can occur from a parabolic trough design solar plant. Flash glare can be very dramatic depending on the contrast lighting behind it. An evaluation of property values, traffic safety, air travel safety and recreational values should be evaluated based on the hazards of the real potential of flash glare. The below photo shows a flash glare event from the Nevada Solar One facility south of Boulder City, Nevada along Highway 93. The photo was taken in January when the background contrast is low.



Comment No. 20-44

In the "Distance Zones" section, the EIS states: "The low profile of the project resembles the natural horizon line" and " The power blocks would be visible in this distance zone if unobstructed viewing conditions exist and the viewer is superior enough to see over the solar collecting arrays and the thirty foot wide fence". This is a misleading statement which ignores the potential location that the viewer is looking from. This statement also downplays the complexity of seasonal sun angle and seasonal contrast lighting. This statement should be removed from the EIS.

Comment No. 20-45

You are also suggesting that the small residential properties would somehow "deflect" the visual impacts from the viewer. This is another ridiculous statement as a 4,000 acre facility would dwarf any residential property or single cell phone tower in the view. Please remove this statement from the EIS.

Comment No. 20-46

Poor quality of KOP photos: The KOP simulations undermine the visual impacts because they are poor quality photos and the simulations from rest areas have been taken from too wide an angle. The time of day of the photo bleaches out the contrast and only represents one of the many perspectives from this photo. These simulations should be done over and better photography should be used.

Comment No. 20-47

The wind fence photos are only taken from the ground perspective. More KOP's should be designed to create a more accurate account of the visual impacts that this 4,000 acre project would create.

Comment No. 20-48

We would like to request that the applicant be required to provide a whole new set of Key Observation Points employing better photography and a more honest perspective of the visibility.

Comment No. 20-49

We would also like to request a full analysis of how the cumulative impacts of so many proposed solar facilities would impact quality of life, property values, and wilderness values of the Amargosa Valley.

We would specifically like to request:

1. Five night lighting Key Observation Points (KOP's) from different elevations in the region.

2. More KOP's from private residents with an evaluation of property value impacts.

3. At least three KOP's from Death Valley National Park, 4 mile away.

4. More KOP's from Big Dune, specifically at higher elevations.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 20-50

People: We are quite surprised that the BLM would even consider approving this Right of Way in a region that lies so close to local residents. Many of the residents of Amargosa Valley are retired and are not seeking the jobs that Solar Millennium is promising. Furthermore, Solar Millennium has made no concrete promises to hire local people. Amargosa Valley does have a small population and the close proximity to a National Park give it an opportunity to maintain a tourism/retirement community economy. The plans to develop this power plant and potentially 30 others are experimental at the very best. In the worst case scenario, there will be several developments that would compromise the scenic character of the area. The lack of water and the experimental nature of large scale renewable development could endanger the stability of a small community.

Building this facility would require the construction of new roads, new transmission lines, increase in security, new medical facilities, and a much larger fire department. In the event of a Therminol fire, would there be enough water and personnel to contain the fire? Who will pay for all of the new infrastructure? Will local people be taxed for the expense of all of these new services? Will power rates rise to pay for transmission upgrades?

As you know, the project will lie in close proximity to private properties with homes on them. We would like to request a full analysis on how the construction of this project will affect local property values.

Comment No. 20-51

Realignment of Amargosa Farm Road: The realignment of this road would cause great inconvenience to local people and has not been worked out with the county. Solar Millennium should not be allowed to realign the Amargosa Farm Road.

Plant Decommissioning:

Comment No. 20-52	The applicant needs to develop a decommissioning plan now and post bonds to make sure funds are available in 30 years in case restoration of the desert is the option taken. The area is healthy habitat now, and there should be a plan for restoring washes and revegetating the site.	A response to this comment is provided on a separate page following this comment document.

Thank you,

Sincerely,

Kevin Emmerich

Laura Cunningham

Basin and Range Watch

P.O. Box 70

Beatty, NV 89003

RESPONSES TO COMMENT NO. 20-01 THROUGH 20-52

Response to Comment No. 20-01

See Chapter 5 (Consultation and Coordination) in the FEIS. The 45-day comment period is consistent with the Council on Environmental Quality regulations for implementing the National Environmental Policy Act regarding the review of draft environmental impact statements. Significant effort was made to advise people of the schedule and duration for the review well in advance. The BLM announced dates and locations of public meetings on their website, and media releases including newspaper advertisement and postal mailers.

Response to Comment No. 20-02

As of December 2009, the proposed Project was one of 31 renewable energy project that have met the required milestones to remain on BLM's fast-track list for expediting processing (BLM 2009a). These projects are advanced enough in the environmental review and permitting process that they could potentially be cleared for approval by December 2010, thus making them eligible for funding under Section 1603 of ARRA. However, the Project schedule has changed and it is no longer eligible for Section 1603 cash grants. The Project is now classified only under Section 1703. The guidelines for meeting Section 1703's requirements, including the requirement to commence construction on or before September 30, 2011 have not changed. While ARRA does provide other types of funding for eligible projects, the proposed Project seeks funding pursuant to Section 1703. The Project is eligible for funding under the DOE's Federal Loan Guarantee program.

Being a part of the fast-track environmental review and permitting process does not involve or result in less than full compliance with applicable laws, including the National Environmental Policy Act. To the contrary, the fast-track process fully complies with all applicable requirements; the difference is that more resources are devoted to that process to allow for review to be conducted and decisions to be made on a faster timeline.

Response to Comment No. 20-03

It is beyond the scope of this EIS to evaluate the environmental or economic benefits of distributed electrical generation in the southwestern United States. Rather, this EIS evaluates the potential environmental effects associated with Solar Millennium's application for a right-of-way to construct, operate and decommission a solar thermal general facility on federal lands. BLM's decision based on this EIS will be whether to grant, deny, or grant with modifications that application.

It is worth noting that the proposed Project is consistent with BLM's multiple-use mandate under FLPMA, and with the 1998 Las Vegas RMP/Final EIS.

In addition, the Project is consistent with renewable energy goals and mandates. To the extent the commenter would prefer a policy that would favor or allow only distributed generation that preference is best expressed to Congress and the State of Nevada.

Response to Comment No. 20-04

It is beyond the scope of this EIS to evaluate the environmental or economic benefits of distributed electrical generation in the southwestern United States. Rather, this EIS evaluates the potential environmental effects associated with Solar Millennium's application for a right-of-way to construct, operate and decommission a dry-cooled solar thermal general facility on federal lands. BLM's decision based on this EIS will be whether to grant, deny, or grant with modifications that application.

Response to Comment No. 20-05

It is beyond the scope of this EIS to develop a list of assumptions that includes detailed plans for integrating various fuels mixes and technologies into each utility's plan, or an overall state plan, or a national plan. This EIS evaluates the potential environmental effects associated with Solar Millennium's application for a right-of-way to construct, operate and decommission a solar thermal general facility on federal lands. BLM's decision based on this EIS will be whether to grant, deny, or grant with modifications that application.

The commenter's view expresses a policy preference best directed to Congress and the State of Nevada.

As for evaluating the proposed Project's impacts on biological, visual, and other resources, the FEIS and supporting documents effectively serve that requirement under NEPA.

Response to Comment No. 20-06

No. Project facilities would be located on approximately 4,350 acres. Should a right-of-way grant be issued, the grant will be issued for the actual amount of lands to be used for the project.

Response to Comment No. 20-07

The proposed project will not have public access roads within the interior of the project site. Access to the project site will be via Valley View Blvd. Prior to commencement of construction, the Proponent must submit a Master Traffic Impact Analysis for review and approval by Nye County. The Analysis shall address the impacts, if any, of the transportation of employees to and from the

Project site. The Developer will provide the improvements required in the approved Master Traffic Impact Analysis in order to mitigate the land use impacts of the proposed Project.

The proposed project is an allowable use of the lands requested under Solar Millennium's right-of-way application. It complies with BLM's multiple-use mandate under the Federal Land Policy Management Act (FLPMA). Although that statute requires that BLM generally provide for multiple uses of the land it administers, it does not require that multiple uses be allowed on every acre of such land. BLM's governing resource management plan for the Project area makes this clear, as do court decisions regarding the discretion BLM exercises in implementing its multiple-use mandate.

Response to Comment No. 20-08

This EIS evaluates the potential environmental effects associated with Solar Millennium's request for a right-of-way to construct, operate and decommission a solar thermal general facility on federal lands they identified in their right-of-way application (Case No. NVN-084359). BLM's decision based on this EIS will be whether to grant, deny, or grant with modifications that application. If other right-of-way applications are cancelled, Solar Millennium or other applicants can file a right-of-way request for those lands. The BLM would be required to conduct a separate NEPA analysis for any such request.

See responses to comments 16-05 and 19-03 for more on why the FEIS examined wet-cooling as an alternative.

The three alternatives studied, plus the many that were dismissed from further analysis because they did not meet the purpose and need for the Proposed Action, provide a reasonable range of alternatives under NEPA. Those alternatives provide meaningfully different choices, in that they are meaningfully different in design, advantages, disadvantages, and effects. An EIS must provide options and must evaluate alternatives that adequately reveal differences in potential impacts between those options. The FEIS effectively meets these requirements.

Response to Comment No. 20-09

It is unclear the exact technology the commenter is referring to, however, as stated in the executive summary in the DEIS and FEIS "The proposed Project would utilize parabolic trough solar thermal technology to produce electrical power using steam turbine generators fed by solar steam generators." Therminol is a heat transfer fluid that is used to produce the steam, by means of a heat exchanger, needed for the steam turbine to function and create electricity.

Response to Comment No. 20-10

The site conditions and proposed technology at the Ridgecrest location are different than the proposed Amargosa site. The proposed Ridgecrest solar facility uses different solar technology (does not include thermal storage which increases efficiencies).

Reasons why a smaller footprint would not be feasible are described in Sections ES-1.4.4.1 and 2.2.1.1.

See also the response to comment 25-03.

Response to Comment No. 20-11

The proposed solar project is required under various laws and regulations to be constructed and operated in a manner that complies with all federal, state, and local laws governing public and worker health and safety, protection of the environment, and terms and conditions of permits and approvals.

Response to Comment No. 20-12

There is no expected release of heat transfer fluid; any spills will be reported immediately to the correct governing agency. Should a fire occur the duration would involve many variables such as the amount of HTF involved, response time from safety personnel, cause, etc. Because of factors that are impossible to predict at this time it is not possible to give an accurate number on how long a fire would take to burn. See also Section 2.3.8 (Fire Protection).

Response to Comment No. 20-13

A Development Agreement has been made and entered into by and between Nye County and Solar Millennium to ensure the land use impacts on public services in connection with the proposed Project are mitigated. The goal of the Development Agreement is to "promote the health, safety, and general welfare of the County and its inhabitants, to minimize uncertainty in planning for and securing orderly development of the Property and surrounding areas, to insure attainment of the maximum efficient utilization of resources within the County in a way that provides the highest economic benefit and least fiscal cost to its citizens, and to otherwise achieve the goals and purposes for which the laws governing development agreements were enacted." A copy of the approved Development Agreement between Nye County and Solar Millennium is provided in Appendix F.

Response to Comment No. 20-14

Per the Development Agreement between Nye County and Solar Millennium, "Prior to accepting hazardous materials within the boundaries of the Proposed Development, Developer shall provide the County a facility emergency plan which contains:

1) a description of the training, equipment, facilities and procedures that will be used to respond to emergencies occurring within the boundaries of the Proposed Development;

2) certification that such equipment, facilities and procedures have been approved by all applicable state and federal authorities; and

3) (a) a description of the emergency response protocols and the respective responsibilities of Developer and County.

(b) Sheriff. Within 60 days of obtaining financing for construction of the ASPP, and annually thereafter for the term of the Agreement, Developer agrees to pay County $20,000 for County's use in providing police services. County agrees to use such funds solely for the purpose of providing police services in the Town of Amargosa.

(c) Fire Protection Training. Developer shall annually, for as long as the ASPP is operating, provide emergency and fire protection training for up to four (4) individuals identified by County. County shall give priority to individuals who serve in the Amargosa Volunteer Fire Department. Such training shall be the equivalent of training provided to Developer's on-site personnel

Within 60 days of obtaining financing for the construction, and annually thereafter for the term of the Agreement, Developer agrees to pay County $20,000 for County's use in providing staff and equipment for County's medical clinic in the Town of Amargosa. County agrees to use such funds solely for such purpose.

No residential, commercial, industrial, or institutional uses are located within the Project area. Concentrated population areas near the Project site include an area east of Sandy Lane, approximately 0.25 mile east of the Project area; and an area west of Valley View Boulevard along Amargosa Farm Road.

Response to Comment No. 20-15

All transported materials will be contained and handled in a manner compliant with the Department of Transportation's Federal Motor Carrier Safety Administration's rules and regulations.

Response to Comment No. 20-16

Security for the facility will maintain compliance with all applicable federal, state, and local laws and regulations.

Response to Comment No. 20-17

All water may be appropriated for beneficial use as provided in Chapters 533 and 534 of the Nevada Revised Statutes. Irrigation, mining, recreation, commercial/industrial and municipal uses are examples of beneficial uses, among others. It is allowable under Nevada state law to buy or sell water rights and change the water's point of diversion, manner of use and place of use by filing the appropriate application with the State Engineer.

Response to Comment No. 20-18

As part of the water appropriation permit application review and authorization, the Nevada State Engineer has the authority to approve and control the amount of groundwater pumped from basins in Nevada. The Nevada State Engineer will determine what measures would be taken should a basin become overextended due to additional growth, drought conditions, or uses by existing or pending water right holders in the basin.

Response to Comment No. 20-19

Water will not be injected into the aquifer. To address uncertainties associated with groundwater use for project construction and operation, Solar Millennium has agreed to acquire and forego the use of no less than 236 afy of existing water rights within the Amargosa Desert Hydrographic Basin (No. 230). Details regarding specific mitigation measures are provided in Appendix A in the FEIS.

Response to Comment No. 20-20

As stated in section 4.17.7.4, in consideration of Nevada State Engineer Order 1197, water needs for any type of project requiring a constant supply of water, and without the benefit of actually owning the water, would need to either lease or purchase the water from an existing water rights holder. Since realistically, the water user can only pump up to the authorized duty of the water right, theoretically there would be no net increase in groundwater pumping within the basin. However, without knowing the average annual pumping amounts for the well to be used, or knowing how the water was used or recharged, it is impossible to determine the impact of groundwater pumping associated with future projects. The Nevada State Engineer will determine what measures would be taken should a basin become overextended due to additional growth, drought conditions, or uses by existing or pending water right holders in the basin.

Response to Comment No. 20-21

The flood that occurred in 1969 generated 3,330 cfs of stormwater runoff measured at the gage station just upstream of US 95. The floods that occurred in 1995 and 1998 generated 1,200 cfs and 340 cfs measured at the same gage station. The Solar Millennium project site has been designed with perimeter flood control facilities to accommodate the 100-year storm event flow determined to be approximately 9,600 cfs.

Drainage from all onsite areas will be routed to detention/retention basins prior to discharging offsite. Any HTF spills that could not be immediately isolated and contained during a storm event would be secondly captured by the basins. Stormwater Pollution Prevention Plans is a requirement of the NDEP NDPES Stormwater Discharge Permit and will be prepared as part of that permit application.

Response to Comment No. 20-22

SF6 is not being utilized in any part or process of the proposed Project, therefore, there is no potential for the proposed Project to emit SF6.

Response to Comment No. 20-23

It is outside the scope of this EIS to analyze carbon sink potential of the project site.

Response to Comment No. 20-24

The proposed Project would comply with Federal and State air quality standards. Particulate emissions during construction would be temporary and mitigated through adherence to the recommended mitigation measures. Operation of the proposed Project would not result in increases of Potential for Significant Deterioration emission levels in the regional area. Five years of meteorological data was utilized for the air modeling process, and wind was included into the air models.

Response to Comment No. 20-25

The BLM does not require surveyors to survey only in wetter than average years and does not hold the project proponent accountable for the change in weather in one year versus the next. Surveys were conducted by qualified biologists following established protocols and guidelines.

Response to Comment No. 20-26

See response to comment 20-25.

As stated in Appendix A.6 mitigation measure WL-6, clearance surveys will be conducted for Desert Tortoise in accordance with all State and Federal regulations. In addition, as stated in Appendix A.6, biological monitors will be on site to ensure that no tortoises, if found on site, are harmed during the construction process.

Response to Comment No. 20-27

See response to comment 20-25.

Response to Comment No. 20-28

Comment noted. The Tierra Data report was only one resource used in the development of the FEIS. Other sources cited throughout the FEIS include Nevada Natural Heritage and various reports developed by agencies and private companies.

Response to Comment No. 20-29

See response to comment 20-28.

Response to Comment No. 20-30

See response to comment 20-28.

Response to Comment No. 20-31

A Biological Assessment has been submitted to the USFWS. Mitigation will be determined in Section 7 consultation between BLM and USFWS. Translocation/relocation methods, if required, will be determined as a part of that mitigation.

Response to Comment No. 20-32

See response to comment 20-25.

Response to Comment No. 20-33

As stated in the DEIS "The dune is composed of Quaternary eolian dune sand derived from Precambrian source rocks, likely the Funeral Mountains southwest of the dune field (Castor et al. 2006; Slate et al. 1999)." Also in section 4.2.1.2 it's stated "As the Big Dune ACEC is approximately 4 miles from the Project area, and as there is no evidence of the Big Dune moving out of the ACEC, it is unlikely that the proposed Project will have any impacts to the Big Dune ACEC."

Response to Comment No. 20-34

As stated in the DEIS "The dune is composed of Quaternary eolian dune sand derived from Precambrian source rocks, likely the Funeral Mountains southwest of the dune field (Castor et al. 2006; Slate et al. 1999)." Also, Section 4.2.1.2 states: "As the Big Dune ACEC is approximately 4 miles from the Project area, and as there is no evidence of the Big Dune moving out of the ACEC, it is unlikely that the proposed Project will have any impacts to the Big Dune ACEC."

Determining the source(s) of sand for the Big Dune Complex is outside the scope for this EIS as the Project is not expected to have any effect on that ACEC.

Response to Comment No. 20-35

Surveys were conducted following USFWS-established protocols. Within the project right-of-way, no owls were observed and only one burrow complex was detected. This burrow complex showed no signs of recent use. Wildlife Mitigation #3 addresses burrowing owls. As this project occurs in Nevada, CDFG mitigation guidelines are not applicable.

Response to Comment No. 20-36

The Bare Mountains are located approximately 15 miles north-northeast of the Project area. According to Johnsgard (Johnsgard, P.A. 1990. Hawks, eagles, & falcons of North America. Smithsonian Institution Press, Washington, D.C. Page 263), Golden Eagle nesting territories range between 42 and 52 square kilometers. This translates to a maximum radius of 1.4 miles. Birds nesting 15 miles away are highly unlikely to utilize the Project area for foraging. The USFWS guidelines for consideration of Bald and Golden Eagles recommends analysis of habitat up to 10 miles surrounding a project site. Assessment of the area surrounding the Project area has been added to Sections 3.6.5.3 and 4.6.2.1. As a good faith effort, the Proponent has committed to develop a site-specific Avian Protection Plan.

Response to Comment No. 20-37

As components of this project do not move with any great speed, collisions with bats are not anticipated.

Response to Comment No. 20-38

See response to comment 20-25.

Rare plant surveys were conducted by BLM-approved botanists using established protocols. These botanists found no indications that any of the rare species listed in the comment were present or were likely to occur within the Project area.

Response to Comment No. 20-39

A comprehensive weed management plan will be developed under the guidance of the BLM and will comply with existing rules and regulations to ensure public health and safety.

Response to Comment No. 20-40

As described in Chapter 2, the site will be cleared and grubbed using heavy duty earth moving equipment. A weed management plan will be developed under the guidance of the BLM.

Response to Comment No. 20-41

Visual impacts are an important consideration for this FEIS. Visual impacts associated with the construction and operation of the proposed Project were addressed in Section 4.12 of the FEIS. KOP selection was developed through review of public scoping meeting summaries and consultation with BLM Visual Resource Management (VRM) staff. Although specific sun angles based on seasonality were not addressed, the position of the solar array in relation to the viewer was described in Section 4.12.1. In this regard, high impact to sensitive viewers was identified when the angle of the parabolic mirrors could result in substantial glint and glare (contrast) to viewers with unobstructed views of the Project.

The angle of the sun will not have a substantial effect to impacts, because the design and location of the parabolic mirrors maximizes the collection of light throughout the year.

Response to Comment No. 20-42

The selection of KOPs was based on the results of the project public scoping meetings and consultation with BLM VRM Resource staff. Effects and mitigation associated with "night sky" within Death Valley National Park have been appropriately addressed in the FEIS, based on the level of detail of the preliminary engineering and design plans associated with the project. Currently, the lighting plan and associated mitigation measures are addressed in Section 4.12.6. Following final engineering design the Proponent will be required to submit a Lighting Plan incorporating mitigation measures that the BLM will revise and approve. However, the FEIS discloses the Project's visual effects based on the Project's near-final design specifications.

Response to Comment No. 20-43

Based on the level of a detailed design, a Glint and Glare study has not been conducted for the purposes of the FEIS. However, the summary of viewer impacts in Section 4.12.1 of the FEIS states that glint and glare could occur based on site specific circumstances. As the Project's final engineering details are developed, the Project's glint and glare will be evaluated and mitigated to the extent feasible. However, the FEIS discloses the Project's glint and glare effects based on the Project's near-final design specifications.

Response to Comment No. 20-44

Comment needs to take into account the context of the paragraph. "The low profile of the Project resembles the natural horizon line the farther the viewer is located from the Project site."

Also in Section 4.12.1 - Distance Zones "In addition to distance, and in the context of solar projects, viewing position or elevation of the viewer as compared to the elevation of the project, influences the perception of Project contrast because viewers at higher elevations tend to see larger portions of the Project within the context of the existing setting."

Potential locations of viewers are considered in 4.12.2.

The effects of impacts based on sun angle were indirectly addressed in Section 4.12.1 (Distance Zones) based on the position of the viewer in relation to the solar array. In this regard, high impacts to sensitive viewers were identified when the angle of the mirrors could result in contrast to viewers with unobstructed views of the Project.

In addition, the design of the project maximizes the reflection of the light to the array tubes throughout the year, thus seasonal changes to impacts would be negligible.

Response to Comment No. 20-45

Comment noted. Intent is not that contrast, or the level of perceived change, is deflected from the Project, but seen in context of existing structures (with similar visual elements [i.e., form, line, color, and texture] as compared to the Project) within the town of Amargosa Valley. The FEIS language has been updated to include 'structures associated with the Town of Amargosa Valley.'

Response to Comment No. 20-46

KOP locations and associated photographs were selected by BLM visual resource staff to represent typical conditions and impacts in Amargosa Valley within the timeframe associated with the FEIS. Simulation photographs were shot using a 50-mm lens and generally a 45 degree field of vision closely resembling the perspective that the human eye sees (excluding peripheral vision).

Response to Comment No. 20-47

KOPs represent typical views within the visual study area and were photographed at approximately 6 feet above ground. The KOP photographs (including simulation photographs) represent what one sees within the foreground/middleground (0-3-5 miles) and background (5+ miles). All KOPs had predominantly level or neutral views of the project area, although some were inferior and one was superior (KOP 15 - Funeral Mountain Wilderness).

Response to Comment No. 20-48

KOP locations were based on public scoping meetings and consultation with the BLM resource staff, and represent a fair and reasonable range of observation points. KOPs represent the range of typical viewing conditions and potential impacts associated with the Project.

Response to Comment No. 20-49

Any proposed action on BLM lands will go through its own NEPA process, it is outside of the scope of this EIS to provide the commenter's requested level of detail for future projects. In addition, there is not enough information available at the time of this FEIS to complete an accurate study of this nature.

In regards to the visual analysis that was completed for the Amargosa Farm Road Solar Power Project, impacts to night sky conditions were not assessed due to the preliminary design plans not containing a lighting plan; however, the FEIS acknowledges the Project's

potential effects to dark skies. In this regard, the applicant has committed to specific lighting mitigation measures per Section 4.12.3.1. Following the final design of the lighting plan, the Applicant will submit a lighting plan in which the BLM will revise and approve.

The selection of KOPs was based on the results of the project public scoping meetings and consultation with BLM VRM Resource staff. The KOPs represent typical viewers, typical viewing distance zones, and typical viewing elevations for sensitive viewers.

Response to Comment No. 20-50

As per the Development Agreement between Nye County and Solar Millennium, the Developer (Solar Millennium) will provide assistance for fire, police, and medical services. Details can be found in Appendix F.

Response to Comment No. 20-51

See response to Comment 16-08

Also, as per the Development Agreement between Nye County and Solar Millennium, the Developer (Solar Millennium) will provide assistance for fire, police, and medical services. Details can be found in the developer agreement in Appendix F.

Response to Comment No. 20-52

A facility closure and decommissioning plan will be developed which describes closure requirements and the anticipated bond level necessary to satisfy BLM requirements.

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Nevada State Clearinghouse

From: Skip Canfield
Sent: Wednesday, April 14, 2010 10:27 AM
To: Nevada State Clearinghouse
Subject: RE: E2010-164 Amargosa Farm Road solar energy project, Nye County - Bureau of Land Management
Attachments: Signed Dark Sky letter.pdf

The Nevada Division of State Lands and the State Land Use Planning Agency offer the following comments regarding the proposed solar facility at Amargosa Farm road:

Comment No. 21-01

Multiple use activities on Nevada's public lands are supported, however, there is a concern about the cumulative visual impacts to public lands users' experiences from these activities (temporary and permanent). Major intrusions include proliferation of new roads, poorly-sited and designed structures, lack of co-location of infrastructure and improper lighting, to name a few.

However, solar facilities are a different type of new application with impacts that extend much broader than a typical "multiple use" application, because a solar application on significant acreage is not a multiple use; it is a single use that will permanently remove these lands from the multiple use concept of public lands. Once the land is bladed, treated and developed for this use, it will not be able to be rehabilitated. In fact BLM most likely will allow the solar developer to take ownership of this land. What is the potential and type of future uses on this site, their compatibility with adjacent public lands and private holdings, and their long-term effects?

Comment No. 21-02

- Therefore, the DEIS should explicitly state how this permanent removal of substantial public acreage **is a benefit to the general public and the multiple use concept of BLM public lands.**

Comment No. 21-03

- Also, the DEIS should explain how all of the ancillary off-site impacts (roads, power lines, etc) that only serve this one permanent special interest **is a benefit to the general public and the multiple use concept of BLM public lands.**

Comment No. 21-04

- The DEIS should detail and explain how the BLM is planning **cumulatively** for all solar projects and their impacts to public lands. A "solar master plan" should be developed and approved by the public similar to, but more detailed than, the programmatic wind EIS that was developed recently. The solar master plan should identify specific development zones and also clearly delineate other areas that should not be developed. The public deserves a plan that gives a comfort level that not all lands will be haphazardly sacrificed permanently for one special interest.

Comment No. 21-05

- The DEIS should go into great detail about the off-site effects to wildlife, vegetation and the ecosystem as this site is bladed and leveled. It should be demonstrated how down slope conditions will not be impacted as the solar field is developed and the natural drainage is interrupted.

Comment No. 21-06

- The DEIS should explain how these large-scale permanent developments affect existing species mitigation plans (e.g. Multiple species habitat conservation plans). If MSHCP's and other adopted policies identify these sites as a component of the species' viability for example, then, if these sites are permanently eliminated, how does the proposal affect the integrity of the existing adopted plans and policies?

Comment No. 21-07

- The DEIS should explain how monetary assurances can be enforced so that the site can be rehabilitated if the applicant cannot complete the project but has already removed the native vegetation. The DEIS should specify that all projects include a condition of approval that mandates up-front performance bonds that would pay for site reclamation if the proponent defaults on the project after the site is denuded. Specific mitigation measures should be employed including things such as scarification and reseeding of the site.

Responses to these comments are provided on a separate page following this comment document.

The following general comments are provided:

Comment No. 21-08

- **Solar facilities should have shields placed on all lights. This should be an enforced condition of approval of all projects.**

Dark sky attributes are a finite resource and subject to increasing deterioration as inappropriately-lighted development covers the landscape. This is even more evident in remote stretches of Nevada where dark skies prevail yet are seriously impacted by even one new lighting source. There is a concern about the cumulative visual impacts to public lands users' experiences.

Comment No. 21-09

- **A comprehensive look at visual impacts should be considered when the BLM reviews any development plans on public lands in Nevada, and nationally.**

The Nevada Division of State Lands encourages federal agencies to develop a consistent policy and "condition of approval" that can be required of applicants and included in NEPA decisions. It is hoped that all Federal agencies would include dark sky lighting and other visual resource protection and mitigation as a condition of approval for permanent and temporary applications. **The BLM should consider the Mojave Southern Great Basin RAC's policy statement on dark sky lighting (attached).**

Comment No. 21-10

The following language is suggested that should be provided up front to applicants who propose development on public lands that includes lighting:

Utilize appropriate lighting:

- Utilize consistent lighting mitigation measures that follow "Dark Sky" lighting practices.
- Effective lighting should have screens that do not allow the bulb to shine up or out. All proposed lighting shall be located to avoid light pollution onto any adjacent lands as viewed from a distance. All lighting fixtures shall be hooded and shielded, face downward, located within soffits and directed on to the pertinent site only, and away from adjacent parcels or areas.
- A lighting plan shall be submitted with the site plan review and/or architectural or engineering drawings indicating the types of lighting and fixtures, the locations of fixtures, lumens of lighting, and the areas illuminated by the lighting plan.
- Any required FAA lighting is exempt from this condition.

In addition, the following mitigation measures should be employed.

Utilize building materials, colors and site placement that are compatible with the natural environment:

Comment No. 21-11

- Utilize consistent mitigation measures that address logical placement of improvements and use of appropriate screening and structure colors. Existing utility corridors, roads and areas of disturbed land should be utilized wherever possible. Proliferation of new roads should be avoided.
- For example, the use of compatible paint colors such as "sudan brown" for water tanks and other vertical structures reduces the visual impacts of the built environment. Using screening, careful site placement, and cognitive use of earth-tone colors/materials that match the environment improve the user experience for others who might have different values than what is fostered by built environment activities.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 21-11 (continued)

- Federal agencies should require these mitigation measures as conditions of approval for all permanent and temporary applications.

A response to this comment is provided on a separate page following this comment document.

Skip Canfield
State Land Use Planning Agency
775-684-2723
www.lands.nv.gov

From: Nevada State Clearinghouse
Sent: Thursday, March 25, 2010 8:59 AM
To: Skip Canfield
Subject: E2010-164 Amargosa Farm Road solar energy project, Nye County - Bureau of Land Management

NEVADA STATE CLEARINGHOUSE
Department of Administration, Budget and Planning Division
209 East Musser Street, Room 200, Carson City, Nevada 89701-4298
(775) 684-0213 Fax (775) 684-0260

TRANSMISSION DATE: 3/25/2010

Division of State Lands

Nevada SAI # E2010-164
Project: Amargosa Farm Road solar energy project, Nye County

Follow the link below to download an Adobe PDF document concerning the above-mentioned project for your review and comment.
E2010-164

Please evaluate it with respect to its effect on your plans and programs; the importance of its contribution to state and/or local
areawide goals and objectives; and its accord with any applicable laws, orders or regulations with which you are familiar.

Please submit your comments no later than Wednesday, April 28, 2010.
EIS also available here.

Use the space below for short comments. If significant comments are provided, please use agency letterhead and include the Nevada SAI number and comment due date for our reference.

Clearinghouse project archive

Questions? Reese Tietje, (775) 684-0213 or clearinghouse@state.nv.us

____No comment on this project ____Proposal supported as written

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RESPONSES TO COMMENT NO. 21-01 THROUGH 21-11

Response to Comment No. 21-01

See response to comment 20-07. The lifespan of the proposed Project is expected to span at least 30 years. At the end of the Project's useful lifespan, the facilities will either be repowered or decommissioned. When the facility is no longer viable, a facility closure and decommissioning plan will be developed which describes closure requirements and the anticipated bond level necessary to satisfy BLM requirements in 43 CFR Parts 2800 and 2900. The required "Performance and Reclamation" bond will ensure compliance with the terms and conditions of the right-of-way authorization, consistent with the requirements of 43 CFR 2805.12(g). The "Performance and Reclamation" bond will consist of three components. The first component will be hazardous materials, the second component will be the decommissioning and removal of improvements and facilities, and the third component will address reclamation, revegetation, restoration and soil stabilization.

Response to Comment No. 21-02

See response to comments 20-07 and 21-01.

Response to Comment No. 21-03

BLM's multiple-use mandate under the Federal Land Policy Management Act (FLPMA) requires that BLM provide for multiple use and sustained yield of the land it administers. Before and since FLPMA was enacted, that mandate has recognized uses as diverse as recreation, mineral extraction, conservation, grazing, and energy development, among others.

The proposed Project is an allowable use under BLM's governing resource management plan, and would comply with BLM's multiple-use mandate under FLPMA if approved. Although FLPMA requires that BLM generally provide for multiple uses of the land it administers, it does not require that every use be allowed on every acre of such land. The governing resource management plan for the Project area makes this clear, as do court decisions regarding the significant discretion BLM exercises in implementing its multiple-use mandate.

Response to Comment No. 21-04

Planning cumulatively for all potential solar development in the southwestern United States is precisely the task being undertaken as part of the Solar Programmatic EIS.

See responses to comments 05-05 and 13-02.

Response to Comment No. 21-05

As stated in Section 2.3.13 and Appendix E, stormwater runoff will be intercepted, conveyed through flood channels, and then released in its historic location within Fortymile Wash in accordance with Nevada Drainage Law.

Response to Comment No. 21-06

A detailed biological survey was conducted for the project area using established protocols. There are no MSHCP that apply to this area. The Proponent will be required to pay a desert tortoise remuneration fee as required by interagency agreements among the BLM, USFWS, and other agencies. At present, the remuneration fee is $774/acre.

Response to Comment No. 21-07

All activities on BLM managed lands that disturb the surface of the land are subject to surface management regulations (43 CFR 3809). The Proponent is responsible for future reclamation of any BLM managed land that is disturbed. The Proponent, prior to the issuance of a right-of-way, must submit a cost estimate and a financial guarantee or Performance Bond to the BLM. The required "Performance and Reclamation" bond will ensure compliance with the terms and conditions of the right-of-way authorization, consistent with the requirements of 43 CFR 2805.12(g). The "Performance and Reclamation" bond will consist of three components. The first component will be hazardous materials, the second component will be the decommissioning and removal of improvements and facilities, and the third component will address reclamation, revegetation, restoration and soil stabilization.

Response to Comment No. 21-08

Comment noted. Dark sky fixtures are recommended in the mitigation measures of the FEIS and will be incorporated into the lighting plan.

Response to Comment No. 21-09

The BLM did consider the Mojave Southern Great Basin RAC's policy statement on dark sky lighting. This information has been provided to the Proponent to implement in its project design and lighting plans. Following final engineering design, the Proponent will be required to submit a Lighting Plan that BLM will revise and approve.

Response to Comment No. 21-10

Dark sky fixtures are recommended in the mitigation measures of the FEIS and are recommended to be incorporated into the lighting plan, as appropriate. The Proponent has committed to specific mitigation measures as defined in Section 4.12.3.1 that will mitigate impacts to night sky to the extent feasible. The lighting mitigation plan will be submitted to the BLM and to the appropriate local authority for review.

Response to Comment No. 21-11

Mitigation measures (Section 4.12.6) recommend color mitigation to blend applicable facilities with the surroundings. Specific site elements such as building locations and access roads have not been designed at the time of this EIS and specific mitigation measures such as placement of improvements cannot be addressed as such.

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Bureau of Land Management – Southern Nevada District
Attn: Mr. Greg Helseth, Renewable Energy Project Manager
4701 North Torrey Pines Dr.
Las Vegas, NV 89130-2301

May 3, 2010

Sent via e-mail: solar_millennium@blm.gov

RE: Amargosa Farm Road Solar Energy Project DEIS

Dear Mr. Helseth:

On behalf of the Center for Biological Diversity, please accept these comments on the Draft Environmental Impact Statement (DEIS) for the Amargosa Farm Road Solar Energy Project proposed by Solar Millennium, LLC.

The Center is a non-profit, public interest environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center has over 255,000 members and on-line activists throughout Nevada and the United States.

We submit these comments on behalf of our members, activists, staff, and members of the general public who are interested in protecting native species and their habitats, quiet recreation activities, and wilderness experiences on Bureau of Land Management (BLM) lands in Nevada and particularly those lands that would be impacted by the proposed action.

The Center has previously submitted scoping comments for this project and incorporate them by reference.[1]

Comment No. 22-01

The development of renewable energy is a critical component of efforts to reduce carbon pollution and climate-warming gases, avoid the worst consequences of global warming, and to assist in meeting needed emission reductions. The Center strongly supports the development of renewable energy production, and the generation of electricity from solar power, in particular. However, like any project, proposed solar power projects should be thoughtfully planned to minimize impacts to the environment. In particular, renewable energy projects should avoid impacts to sensitive species and habitat, and should be sited in proximity to the areas of electricity end-use in order to reduce the need for extensive new transmission corridors and the efficiency loss associated with extended energy transmission. Only by maintaining the highest environmental standards with regard to local impacts, and effects on species and habitat, can renewable energy production be truly sustainable.

Having reviewed the Plan of Development (POD) and DEIS for this project, and having visited the site personally, we know that it has areas devoid of human disturbance and as such the projects may have major impacts to biological resources in this area. We present the following comments for your consideration.

A response to this comment is provided on a separate page following this comment document.

[1] Center for Biological Diversity, letter to BLM dated October 12, 2009.

Comment No. 22-02

1. Impacts on desert tortoise. The desert tortoise is protected as Threatened under the Endangered Species Act. The desert tortoise is continuing to decline throughout its range despite being under federal and state Endangered Species Acts protection as threatened.[2] The project area lies in the Eastern Mojave Recovery Unit for the desert tortoise, and within potential occupied habitat.[3] The DEIS discloses that as part of the preparation of the site for solar energy development, mass grading and leveling would be required, which would destroy around 4350 acres of tortoise habitat and render it unsuitable for the foreseeable future.

Under the National Environmental Policy Act ("NEPA"), the DEIS must address the impacts of this project and other linked projects to the survival and recovery of desert tortoise in this recovery unit and take seriously the development of meaningful alternatives to this project that will avoid impacts to the species and its habitat. As the BLM is aware, it is increasingly difficult to find intact, high quality desert tortoise habitat in private ownership that could be purchased and conserved to provide some mitigation for the loss of other occupied desert tortoise habitat in the Eastern Mojave Recovery Unit such as the lands proposed for this solar plant. Therefore, avoiding impacts to this essential habitat and maintaining the largest possible areas of intact, high quality habitat is absolutely critical for recovery of the species. It is interesting to note that in the section of the DEIS on threats to the desert tortoise, no mention is made of mass grading for commercial facilities such as this proposal.[4]

While the project area is admittedly of lower quality than many areas identified as critical habitat, it is none-the-less fully functional habitat for tortoises. The DEIS seems to imply that the tortoise has been extirpated from the project area based on failure to detect tortoises on site in the spring of 2009 and the presence of tortoises elsewhere.[5] Given the secretive nature of desert tortoises and their behavior of spending much of their life in below ground burrows, their absence cannot be assumed from a single season of monitoring. Also, no protocols for the monitoring were provided nor the qualifications of those doing the surveys.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 22-03

The DEIS fails to clearly address actions for avoiding, minimizing and mitigating impacts to the desert tortoise and its habitat. Appendix A of the DEIS does not address avoidance and minimization, despite its title. The BLM must first look to ways to avoid impacts to desert tortoise, for example, by identifying and analyzing alternative sites outside of tortoise occupied habitat, areas that have already been severely disturbed by prior land use, or by employing the alternative solar energy strategy of distributed power. The BLM must also look at ways to minimize any impacts that it finds to be unavoidable, for example by requiring designs that minimize ground disturbances, limiting access roads, and provide for functional tortoise access across the site. The standard mitigation measures found in Appendix A are a start, but others might include the acquisition of lands (or possibly acquisition of water rights to protect surface vegetation in desert tortoise habitat) that would be perpetually managed for conservation, or the funding of specific conservation measures on federal lands to benefit tortoise conservation such

[2] U.S. Fish & Wildlife Service. 2008. Draft range-wide monitoring of the Mojave population of the desert tortoise: 2007 annual report. Report by the Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service, Reno, Nevada. Pgs. 50. Available at: http://www.fws.gov/Nevada/desert_tortoise/documents/reports/2007_Rangewide_Desert_Tortoise_Population_Monitoring_DRAFT.pdf

[3] U.S. Fish and Wildlife Service. 1994. Recovery plan for the Mojave population of the desert tortoise (*Gopherus agassizii*) at 21. U.S. Fish and Wildlife Service. http://www.fws.gov/endangered/recovery/index.html#plans

[4] DEIS, pages 3-84 - 3-86.

[5] DEIS, page 3-86.

Comment No. 22-03 (continued)

as fencing of key roads to protect tortoises or permanently retiring grazing allotments in desert tortoise habitat.

Comment No. 22-04

2. Climate change and landscape linkages. In light of unprecedented climate change, animal and plant species will attempt to adapt by expanding their ranges north and upslope to cooler conditions mimicking their current habitats, and abandoning their present no longer hospitable ranges. At a 2008 Desert Manager Group symposium entitled, "Climate and Deserts Workshop", Wayne Spencer of the Conservation Biology Institute gave a compelling lecture on this likely scenario in which he called for the maintenance of broad ecological connectivity and the minimization of movement barriers to conserve species and ecological processes in the face climate change.[6] Such connectivity is not only important for the physical movement of species but perhaps more so for the conservation of genetic diversity and the prevention of genetic bottlenecks.

At the same workshop, Kirsten Ironside presented on predicting climate change impacts. She presented historic data and modeling that suggests that species found abundantly in California and southern Nevada, such as Joshua tree, will be rare or eliminated from their current ranges and given the means will be extending northward into Nevada and Utah.[7]

The project site unfortunately could impose a significant barrier to future movement and gene flow between populations within the Eastern Mojave Recovery Area, as well as with populations in the Northeastern Mojave Recovery Area. The DEIS fails to analyze and disclose the projects' impacts to movement corridors and habitat connectivity taking into account the heightened importance of such corridors in light of climate change.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 22-05

3. Cumulative and connected actions

NEPA's implementing regulations state that agencies should consider similar, reasonably foreseeable actions together in the same environmental review document when the actions "have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography," and the "best way to assess adequately [their] combined impacts [...] or reasonable alternatives" is to consider them together. 40 C.F.R. 1508.25(a)(C). It is important for federal agencies to consider connected actions together in a single NEPA process as opposed to segmenting review. *Daly v. Volpe*, 514 F.2d 1106, 1110 (9th Cir. 1975) (where actions are interconnected in terms of fulfilling a joint purpose it may be necessary to conduct a single NEPA review). Here, the BLM should coordinate this NEPA process with the approval process for all of the connected actions including the transmission lines and substations that are proposed to serve this site. This would allow all of the projects' significant impacts to be fully considered together.

Comment No. 22-06

In particular, the BLM must consider together the additive impacts to biological resources, including the desert tortoise and its habitat, from the proposed solar project and from the other proposed projects in the area to ensure that the true extent of impacts are fully disclosed and analyzed. BLM should not treat this critical analysis as a cumulative impacts question alone. Because the currently proposed projects are linked and interdependent they should be evaluated together under NEPA. Most importantly, this project will have direct impacts on desert tortoise

[6] Managing Landscape Linkages to Conserve Desert Wildlife During Climate Change, by Wayne Spencer at: http://www.dmg.gov/climate/agenda.html .

[7] Modeling Approaches for Predicting Climate Change Impacts on Natural Systems; From Inputs to Algorithms to Outputs and What They Can Tell Us, by Kirsten E. Ironside at: http://www.dmg.gov/climate/agenda.html .

Comment No. 22-06 (continued)

populations in the Eastern Mojave Recovery Unit; up to 4350 acres of tortoise habitat will be taken if it is approved and permitted for development. BLM must look at those impacts in a comprehensive way that would allow it to formulate meaningful alternatives that could avoid many of the impacts of these linked projects and where impacts remain that cannot be avoided through alternatives, provide for comprehensive minimization and mitigation measures that will ensure that impacts to this recovery unit are appropriately mitigated. Ultimately, BLM must ensure that the approval of these linked projects does not impair the recovery of the desert tortoise populations in the Eastern Mojave Recovery Unit.

While an attempt was made in the DEIS to fulfill this mandate, the cumulative effects analysis falls short, particularly with respects to water, vegetation and wildlife.

Comment No. 22-07

With regards to water, both hydrologic surface function and groundwater are of concern. A recently released research report on desert ephemeral and intermittent streams, offered the following,

> "Ephemeral and intermittent streams provide the same ecological and hydrological functions as perennial streams by moving water, nutrients, and sediment throughout the watershed. When functioning properly, these streams provide landscape hydrologic connections; stream energy dissipation during high-water flows to reduce erosion and improve water quality; surface and subsurface water storage and exchange; ground-water recharge and discharge; sediment transport, storage, and deposition to aid in floodplain maintenance and development; nutrient storage and cycling; wildlife habitat and migration corridors; support for vegetation communities to help stabilize stream banks and provide wildlife services; and water supply and water-quality filtering. They provide a wide array of ecological functions including forage, cover, nesting, and movement corridors for wildlife. Because of the relatively higher moisture content in arid and semi-arid region streams, vegetation and wildlife abundance and diversity in and near them is proportionally higher than in the surrounding uplands. Ephemeral and intermittent stream systems comprise a large portion of southwestern watersheds, and contribute to the hydrological, biogeochemical, and ecological health of a watershed. Given their importance and vast extent, it is concluded that an individual ephemeral or intermittent stream segment should not be examined in isolation. Consideration of the cumulative impacts from anthropogenic uses on these streams is critical in watershed-based assessments and land management decisions to maintain overall watershed health and water quality."[8]

Responses to these comments are provided on a separate page following this comment document.

Comment No. 22-08

The proposed project will significantly impact and disrupt the hydrology of the Fortymile Wash, as will other projects that have been applied for in the drainage. Given the above stated ecological and hydrological importance of these dry washes, the BLM should have

[8] Levick, L., J. Fonseca, D. Goodrich, M. Hernandez, D. Semmens, J. Stromberg, R. Leidy, M. Scianni, D. P. Guertin, M. Tluczek, and W. Kepner. 2008. The Ecological and Hydrological Significance of Ephemeral and Intermittent Streams in the Arid and Semi-arid American Southwest. U.S. Environmental Protection Agency and USDA/ARS Southwest Watershed Research Center. EPA/600/R-08/134, ARS/233046. 116 pp.

Comment No. 22-08 (continued)

conducted a watershed-based assessment to determine the ecological and hydrologic impacts from the proposed solar facilities in the Fortymile Wash, disclose the findings in the EIS, along with appropriate avoidance, minimization and mitigation measures.

Comment No. 22-09

With respect to groundwater resources, the BLM does list all known potential uses of groundwater, including the construction and operation of ten renewable energy projects, but it fails to estimate the total water needs of those proposed projects and cumulative impacts of all of the existing and proposed groundwater needs and uses. While precise plans are not yet known, the BLM can and should have developed a "best estimate" or "worst case scenario" upon which to conduct the required cumulative impacts analysis.

Comment No. 22-10

Another flaw in the DEIS is a reliance on the Nevada State Engineer's Order 1197 to support their contention that there would be no net increase in groundwater pumping in the basin. The cumulative impacts analysis area is loosely defined in the DEIS as the area between Beatty and Highway 160.[9] The ground water flow system in this part of Western Nevada is dominated by interbasin flows with several relatively shallow and local flow systems that are superimposed on deeper intermediate and regional flow systems. Regional ground water flow generally follows the regional topographic gradient as water moves toward the low point in the system at Death Valley.[10] The Nevada State Engineer determined in 2008 that the regional pumping of ground water was causing declining water levels in Devil's Hole at the detriment to federal reserved water rights to protect the Devil's Hole pupfish, and ordered that, "any applications to appropriate additional underground water and any application to change the point of diversion of an existing ground-water right to a point of diversion closer to Devil's Hole, described as being within a 25 mile radius from Devil's Hole within the Amargosa Desert Hydrographic Basin, will be denied."[11]

Responses to these comments are provided on a separate page following this comment document.

Comment No. 22-11

In the 1998 Ruling 4669, the State Engineer found, in response to a water right application in Oasis Valley, that, "It is generally accepted that the groundwater and surface water resources of this area are closely related; therefore, any adverse effects caused by additional pumpage of underground water would ultimately effect the areas spring flows. The State Engineer concludes that the additional pumpage represented by Application 63482, if approved, would create an adverse affect on the underground and surface water rights of the groundwater basin. The State Engineer concludes that to grant a permit under Application 63482 in a groundwater basin where the quantity of water under existing appropriations exceeds the perennial yield would conflict with existing rights and be detrimental to the public interest."[12]

This Ruling is pertinent to the proponent's project because the Oasis Valley is also part of the Death Valley Regional Ground Water Flow System and is likewise in the Central

[9] DEIS, page 4-105.
[10] See Faunt et al.
[11] Office of the State Engineer, Order 1197. Available at: http://water.nv.gov/Orders&Rulings/Orders/Order_list.cfm .
[12] Office o the State Engineer Order 4669. Available at: http://water.nv.gov/Orders&Rulings/Rulings/rulings_query.cfm

Comment No. 22-11 (continued)

Death Valley Subregion.[13] As indicated in the State Engineer's statement quoted above, as well as in the findings of Faunt et al., the surface and ground water resources of the Amargosa Desert are closely tied and there is much inter basin flow and connectivity. However, the Order BLM relies on only covers a portion of the groundwater flow system of concern and, therefore, pumping in other areas that can lead to a net increase of groundwater losses and associated cumulative impacts are a real possibility and are not covered in the cumulative impacts analysis.

Comment No. 22-12

Concerns over the adequateness of the indirect and cumulative impacts analysis for vegetation and wildlife are inextricably linked through ecological function. The loss of over 106,000 acres of desert vegetation and thereby desert habitat is stated in the DEIS, but no discussion of indirect impacts to the remaining habitat is provided and no meaningful cumulative impact analysis is provided. While generalized impacts are mentioned in section 4.17.7.7 of the DEIS, no tie is made to impacts of this magnitude of loss in terms of habitat fragmentation and other impacts to the viability or recovery of the desert tortoise or other rare desert wildlife such as the Amargosa toad, LeConte's and Bendire's thrashers, Brewer's sparrow or burrowing owl.

These weaknesses and omissions must be addressed in a the supplemental DEIS.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 22-13

4. Mitigation for loss of habitat.

Considering the loss of 4350 acres of desert habitat, loss of ecological function, particularly of desert washes, the need for groundwater for operations and maintenance in an over-allocated basin, and the contribution to future cumulative impacts, this project should provide additional mitigation to address the long term needs of common and rare plant and wildlife species. The Center suggests that as part of the mitigation for this project the proponent be required to purchase and permanently retire existing ground and/or surface water rights for conservation, perhaps by deeding them to the Fish and Wildlife Service.

Comment No. 22-14

5. The DEIS failed to address sulfur hexafluoride (SF6) and measures to manage and control impacts to global climate from it.

SF6 is a synthetic gas used as an insulating medium in the electric power industry as an insulator and/or arc quenching medium.[14] SF6 is the most potent known greenhouse gas with a global warming potential that is 23,900 times greater than that of carbon dioxide. It is also very persistent in the atmosphere, with an estimated lifetime of 3,200 years. The common sources of SF6 pollution in the high voltage electric industry come from poor gas handling procedures during equipment installation, maintenance and decommissioning and leakage from circuit breakers and other SF6 containing equipment.[15]

[13] See Faunt et al.
[14] EPA. 2002. SF6 Emissions reduction partnership for electric power systems: an opportunity for industry. Office of Air and Radiation. EPA430-F-000-19.
[15] Blackman, J., M. Averyt, and Z. Taylor. SF6 leak rates from high voltage circuit breakers – U.S. EPA investigates potential greenhouse gas emissions source. Available at http://www.epa.gov/electricpower-sf6/documents/leakrates_circuitbreakers.pdf .

Comment No. 22-14 (continued)

In the U.S. the two industries with the highest purchases of SF6 are the original equipment manufacturer for electric power systems (59% of total sales) and electric utilities (22%).[16] An EPA draft report from 2000 found U.S. domestic emissions of SF6 to be 1,074 metric tons in 1998 and estimated that by 2010 they would reach 1,381 metric tons.[17]

To combat SF6 emissions, the EPA established a voluntary public-private partnership with electric utilities that wish to take a proactive stance on climate change by slowing the growth of greenhouse gas emissions. The SF6 Emission Reduction Partnership for Electrical Power Systems ("partnership") is one of these groups. This partnership began in 1999 and according to information on the EPA website, now number over 80 electric utilities.[18]

Through this voluntary program, partner members have been able to achieve a 53% reduction in absolute emissions from the 1999 baseline. In 2006-07 partners reduced emissions by 50,496 pounds of SF6, and cumulatively since 1999 reductions total 1,554,278 pounds of SF6, or 16.85 million metric tons of carbon dioxide equivalent.[19]

These reductions have been accomplished voluntarily through improved operation practices, equipment leak detection and repair, equipment updates and establishment of best management practices and employee training.[20]

A supplemental DEIS should include a discussion and disclosure of the likely SF6 emissions from the proposed project and its associated transmission lines, and discuss how such emissions will be avoided, managed or mitigated. The positive example from the partnership serves to show that the proponent can and should be able to take affirmative steps to reduce the emission of this potent greenhouse gas.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 22-15

6. Restoration and Decommissioning.

The DEIS failed to address the long term fate of the lands included in this right-of-way application. The NEPA analysis should analyze and document the likely scenario(s) that would occur should the facility be permitted and then later decommissioned. Desert lands are notoriously hard to revegetate or rehabilitate[21] and revegetation never supports the same diversity that originally occurred in the plant community prior to

[16] Knopman, Debra and Katie Smythe. 2007. 2004-2006 SF6 Data. PM-2327-NEMA. Prepared by the RAND Corporation for the National Electrical Manufacturers Association.
[17] EPA. 2000. Estimates of U.S. emissions of high-global warming potential gases and the costs of reductions. Draft Report. Office of Air and Radiation.
[18] See: http://www.epa.gov/highgwp/electricpower-sf6/index.html
[19] EPA. 2008. 2007 Annual report - SF6 Electric Reduction Partnership for Electric Power Systems. See: http://www.epa.gov/highgwp/electricpower-sf6/resources/index.html
[20] Ibid.
[21] Lovich and Bainbridge 1999

Comment No. 22-15 (continued)

disturbance[22]. The task of revegetating a site this large will require significant financial resources. In order to assure that the ambitious goals of the revegetation effort is met post project closure, it will be necessary to bond the project, so that all revegetation obligations will met and assured. The bond needs to be structured so that it is tied to meeting the specific revegetation criteria. The BLM should include a requirement for bonding or guaranteed financial assurance from the proponent to cover decommissioning the facility and restoration of the site, as well as a discussion of the likely end land use.

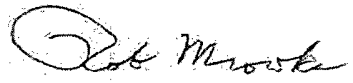
Comment No. 22-16

If privatization of this site is a reasonably foreseeable option or alternative, the BLM should have analyzed and disclosed the impacts as part of this NEPA analysis and should correct this omission in a supplemental DEIS.

Responses to these comments are provided on a separate page following this comment document.

Thank you for this opportunity to comments and we look forward to other opportunities to provide review and input including review of a supplemental DEIS that should be prepared to address many of the omissions in the DEIS discussed in these comments.

Sincerely yours in conservation.



Rob Mrowka
Nevada Conservation Advocate

[22] Longcore 1997

RESPONSES TO COMMENT NO. 22-01 THROUGH 22-16

Response to Comment No. 22-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 22-02

USFWS protocols were followed when conducting surveys in 2009.

See response to comment 20-25.

USFWS monitoring protocols will be followed during construction monitoring. These protocols state that monitoring will be conducted by a USFWS-authorized biologist. Detailed monitoring and mitigation requirements will be developed as part of the Section 7 Endangered Species Act consultation process between BLM and USFWS. A Biological Assessment has been submitted and will be made publicly available with a Biological Opinion when this inter-agency consultation is complete.

Response to Comment No. 22-03

As addressed in Section 2.2.1.1, alternative sites were assessed and eliminated as viable alternatives. The BLM is currently in Section 7 consultation with the USFWS. Final mitigation will be determined as a part of this process.

Response to Comment No. 22-04

A study involving the movement of species due to climate change is outside the scope of this EIS. There is not enough information available at this time to allow for a reasonable assessment of what impact the project may or may not have on future movement corridors for protected species, based on climate change trends. Further information about impacts to protected species, including mitigation measures to avoid and/or minimize those impacts, will be developed during the Section 7 consultation process.

Response to Comment No. 22-05

The Final EIS contains substantive improvements in the cumulative analysis, and the reader is referred to Section 4-17 of the Final EIS. VEA is currently performing system impact studies based on interconnection requests to determine the type and scale of upgrades

required to accommodate future load growth within their service territory. VEA will file a right-of-way application or update to accommodate these upgrades, and the BLM will prepare a separate NEPA review of VEA's proposed action.

Response to Comment No. 22-06

Although many solar projects have been proposed for the Amargosa Valley, it is highly unlikely that all or even most of those projects will be developed. It is speculative to make assumptions regarding impacts of all projects with applications submitted to BLM. As stated in 4.17.4, the likelihood of implementation of these cumulative projects is unknown. Each project will be required to comply with NEPA which will include a cumulative effects analysis.

Response to Comment No. 22-07

Comment noted. The USACE has indicated that it would likely assert jurisdiction on certain drainages that traverse the project site. A complete assessment of the potential effects to jurisdictional waters from project construction and operation cannot be completed until a Jurisdictional Determination is issued by the USACE. That document will identify all jurisdictional waters, including ephemeral waters; describe the Project's impacts on those waters; and prescribe appropriate mitigation measures.

The consultation process between BLM and the UUSFWS under Section 7 of the Endangered Species Act will identify impacts and require mitigation measures for all federally protected plant and animal species and habitat functions, including those associated with ephemeral streams.

Response to Comment No. 22-08

See response to comment 22-07.

Response to Comment No. 22-09

The DEIS followed Council on Environmental Quality guidelines in developing the cumulative analysis. In addition, the final EIS contains substantive improvements in the cumulative analysis, and the reader is referred to Section 4.17 of the FEIS for further information on cumulative analysis.

Response to Comment No. 22-10

The Nevada State Engineer's Order 1197 greatly influences water development in the Amargosa Desert Hydrographic Basin. The BLM acknowledges that the groundwater flow system in western Nevada is dominated by various flow systems. However, there is a

level of uncertainty regarding groundwater flow and availability within a given region. Environmental resource data were collected and analyzed to the level of detail necessary to understand potential impacts and to distinguish project effects (both beneficial and adverse) among the Proposed Action and alternatives. The data analyzed in this EIS are the best available representation of current and predicted conditions.

Response to Comment No. 22-11

See response to comment 22-10.

Response to Comment No. 22-12

It is speculative to make assumptions of impacts of all projects with applications submitted to BLM. As stated in 4.17.4, the likelihood of implementation of these cumulative projects is unknown. Each project will be required to comply with NEPA which will include a cumulative effects analysis. Should the agencies determine that impacts are becoming too great for the area or sensitive species, projects may not be permitted or allowed to proceed. Any single project or group of projects will be identified as such, and BLM, in consultation with its coordinating agencies, will determine whether to approve those projects.

Response to Comment No. 22-13

To address the NPS, USFWS, and BLM concerns that the proposed groundwater withdrawals associated with the proposed Project—in combination with existing withdrawals in the vicinity of Devils Hole and the Ash Meadows NWR — may pose a risk of adversely affecting federal rights and resources, the Proponent has agreed to acquire an additional 236 afy of existing water rights within the Amargosa Desert Hydrographic Basin. The 236 afy consists of 204 afy identified as "Minimization Water Rights" (see Appendix A), and an additional 32 afy to offset the potential reduction in groundwater return flow as a result of changing the manner of use from agricultural to industrial. The acquisition of the additional 236 afy of existing groundwater in the basin will most likely be obtained from existing water rights permitted for agricultural use. At this time, it is unknown where the additional water rights will be obtained.

To comply with its obligations under Section 7 of the Endangered Species Act, BLM is consulting with the U.S. Fish & Wildlife Service regarding the potential impacts of the proposed Project and alternatives on protected species. Mitigation measures to avoid and/or minimize any adverse effects have been developed as a part of that process. Such measures include compensatory mitigation for Desert Tortoise and groundwater studies, conservation of groundwater through the purchase of additional water rights, and surveys and monitoring for Desert Tortoise.

Response to Comment No. 22-14

SF6 is not being utilized in any part or process of the proposed Project, therefore there is no potential for the proposed Project emit SF6.

Response to Comment No. 22-15

As stated in Section 2.3.16, a decommissioning plan including appropriate mitigation will be developed.

Response to Comment No. 22-16

Privatization of this site is not a reasonably foreseeable option or alternative.

attn: Greg Helseth
Michele Bilodeau

BLM Las Vegas Field Office
Attn: Greg Helseth
Renewable Energy Project Manager
4701 N. Torrey Pines Drive
Las Vegas, NV 90130

May 3, 2010

solar_millennium@blm.gov

RE: Solar Millennium LLC, Amargosa Farm Road Concentrating Solar Energy Project
Comments on behalf of the Amargosa Conservancy

Dear. Mr. Helseth:

The Amargosa Conservancy is a local, bi-state conservation organization, devoted to preserving the lands, waters and beauty of the Amargosa region. We appreciate the opportunity to comment on the draft Environmental Impact Statement (DEIS) for the two Solar Millennium concentrating solar generation facilities (plants) proposed to be located on public lands adjacent to Amargosa Farm Road in Nye County, Nevada.

Comment No. 23-01

The Amargosa Conservancy supports a major increase in the use of solar and other renewable energy generation technologies to replace fossil fuels. We believe that unless greenhouse gases are significantly reduced, our southwest deserts may experience an even more arid climate and a less hospitable environment for all life that is dependent on scare water supplies, including its small human communities.

Comment No. 23-02

Our principal concern with this and the many other solar generating facilities proposed for the Amargosa region is their use of groundwater. We applaud Solar Millennium for now proposing to use dry cooling, and believe that this option should remain BLM's agency-preferred alternative. However, the two plants still propose to use large quantities of pumped groundwater—400 acre-feet per year. According to the Nevada state engineer, the Amargosa Valley hydrographic basin from which the water would be pumped is overallocated, and current pumping greatly exceeds replenishment in the aquifer.

Current groundwater pumping largely supports agricultural uses, which are significantly different than proposed industrial uses. Transferring water rights from agricultural uses, which are variable, to renewable energy uses, which are steady, should at very least require mitigation in the form of retirement of existing rights in some multiple of the proposed industrial uses. Mitigation for groundwater use should be mandated even though existing water rights may give current pumpers legal authority to mine the aquifer.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 23-03

Our concern for future water withdrawals is heightened by the absence of any comprehensive cumulative impacts analysis in the DEIS. As noted, there are many applications for rights of way for renewable facilities on public lands in the Amargosa basin. Absent a programmatic impacts analysis of the specific effects on regional groundwater supplies of the universe of plants which may be built, which has not been completed, the burden falls on this, the first, DEIS to present a comprehensive analysis of the cumulative effects of all of the proposed facilities in the region. The existing DEIS fails to do this, asserting that plans of development for future facilities are required to be filed before their effects can be considered in a cumulative impacts analysis.

We believe that this is incorrect, contrary to good sense and clearly circumventing the requirements of the CEQ's guidance on when and how cumulative effects need to be considered. Moreover, the need for speedy action does not excuse compliance with these requirements. CEQ guidance requires that the effects of all reasonably foreseeable future actions that might affect the resource in question be considered.

Comment No. 23-04

In our view, the triggering event for inclusion of the effects of other plants is the BLM's acceptance of applications for solar plants on public lands in the vicinity, which has committed public resources to particular purposes. The location and total number of committed acres is known, and reasonable estimates of groundwater use can be inferred from the size and nature of the filings. Locations and ranges of water use can then be estimated. Reasonable forecasting is required by NEPA and it is the responsibility of federal agencies to predict the environmental effects of proposed actions before they are fully known. See *Scientists' Institute for public Information. Inc. v Atomic Energy Commission* 481 F2d. 1079 (DC Cir.) and *Considering Cumulative Effects under the National Environmental Policy Act*, CEQ, 1997, at 19. .

Comment No. 23-05

Even if the agency believes some renewable plants may not be built, the effects on groundwater of those plants cannot be excluded (until the land is released) and the agency has the duty to evaluate the unknown effects based upon theoretical approaches or research methods generally accepted in the scientific community. (40 CFR Section 1502.22). This was not done.

Comment No. 23-06

This analytic failure is compounded by the absence of recommendations for a strong monitoring and mitigation program (such as a trigger set-up, in which a certain level of aquifer response triggers mitigation activity such as reduction in pumping and additional investigation and monitoring. As written, the DEIS would result in an environmentally risky project where long-term impacts may be caused due to relatively short-term operations. Further evaluation of the numerical groundwater flow which forms the basis for the decision-making aspects for the project is essential. The analysis as presented is clearly insufficient to approve the project. We recommend that the DEIS be re-scoped to include a more thorough cumulative effects of renewable energy in the Amargosa Valley and the surrounding area, especially their effects on groundwater development and use.

Responses to these comments are provided on a separate page following this comment document.

Again, we appreciate the opportunity to comment on this important agency evaluation and look forward to further agency action clarifying the effects of this and additional plants on the groundwater ion the Amargosa basin.

Sincerely,

Donna Lamm
Executive Director

Amargosa Conservancy
P.O. Box 63
Shoshone, CA 92384

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RESPONSES TO COMMENT NO. 23-01 THROUGH 23-06

Response to Comment No. 23-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 23-02

See response to Comment No. 20-18.

Response to Comment No. 23-03

As part of the water appropriation permit application review and authorization, the Nevada State Engineer has the authority to approve and control the amount of groundwater pumped from basins in Nevada. The Nevada State Engineer will determine what measures would be taken should a basin become overextended due to additional growth, drought conditions, or uses by existing or pending water right holders in the basin.

Response to Comment No. 23-04

The DEIS followed Council on Environmental Quality guidelines in developing the cumulative analysis. In addition, the final EIS contains substantive improvements in the cumulative analysis, and the reader is referred to Section 4.17 of the FEIS for further information on cumulative analysis.

Response to Comment No. 23-05

See response to Comment No. 23-04.

Response to Comment No. 23-06

The DEIS followed Council on Environmental Quality guidelines in developing the cumulative analysis. In addition, the final EIS contains substantive improvements in the cumulative analysis, and the reader is referred to Section 4.17 of the FEIS for further information on cumulative analysis.

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Comments on Draft EIS for Amargosa Farm Road Solar Energy Project
Solar Millennium

I have reviewed the comments in the Draft EIS that relate to the issues I raised in my original comments submitted on the proposed Solar Facility our my town. I have the following concerns in the DEIS as presented for public review

Water

Comment No. 24-01

The DEIS as written considers both Wet- and Dry-cooled solar technology. I understand that all alternatives must be considered in the EIS process, including no action. Solar Millennium has announced its intention of using dry-cooling technology. In section ES-1.4.5 it states: ***The BLM is awaiting public input before identifying a preferred alternative***. I reiterate that it is prudent for the BLM to insure dry-cooling technology will be used by the proponent to protect water resources in the basin as part of any responsible management of desert land.

Comment No. 24-02

It was requested that the planned point of water diversion be located and the existing usage be quantified for evaluating the effect of the project water usage on the resource (Table 1-7). This was accomplished with the model. However, I believe the conclusion that there would be a small shift in the quantity of water recharge by changing from irrigation to commercial use is not substantiated. First, the model was run for 400 AFA ground-water withdrawal rate when this document has not tied them to that level of use. Second, they note that they don't have an estimate of recharge that could be introduced by mirror washing. The Stonestrom, et. al. 2003 paper notes that percolation from precipitation on the open desert is negligible. High temperature and low humidity throughout most of the year restrict all but the heaviest rainfall to the vadose zone where either evaporation or plant uptake captures the water. Only in active stream channels did rainfall percolate down far enough to escape the vadose zone and recharge ground water. If the applicant applies water to the surface of the project area to control dust (discussed elsewhere) and successfully creates a protective crust that resists wind erosion, the percolation from mirror washing will have about the same chance of recharge percolation as the open desert. According to the Stonestrom, et. al. report, the percolation recharge found in their study is a function of large quantities of water spread on the desert, in this case for the purpose of growing crops. That is not the purpose of mirror washing, and no quantification water usage is provided for this activity. There is also no quantification of water usage for dust control. These are two critical pieces of information that should be brought forward during the EIS process in order to support the proponents stated need for water. We would hate for the project to go forward and begin construction only to find they actually need more water, which is a critical local resource.

Comment No. 24-03

Comment No. 24-04

My understanding of the EIS process is for the government to involve the public in the process of permitting use of public land. This ground-water model shows subsurface-water levels will decline with continued use of 1328 AFA from the proposed point of diversion (App B, Fig 5). Some undefined recharge will be lost with the transfer of irrigation water to commercial use. Nowhere in this document is there any discussion of mitigation of this impact to local water supplies. Certainly the ground-water model report was aimed at the Devils Hole pupfish, but water supplies in the residential and

Responses to these comments are provided on a separate page following this comment document.

Comment No. 24-04

agricultural areas are of greater importance to Amargosa residents. Our water supply deserves to be protected as much as the endangered fish. Why was this mitigation not included in Appendix A.4? If this information is not provided until the final EIS, where is the public involvement in this important aspect of the project?

Comment No. 24-05

Flooding

Although limited in detail, the proposal to route Fortymile flow around the project and reintroduce it to its natural drainage, including dissipation of energy and return to sheet flow, is as natural a solution as we could ask for. However, I have some concern about the cheaper alternative of building a detention basin north of highway 95 on land which may not be controlled by the BLM, since DOE and DOD lands are located in close proximity to the highway. Besides this area possibly being under multiple governing agencies, the proponent notes the possible benefit of such a basin to all downstream land use. They state that they will continue to pursue the possibility of this alternative with the BLM and Nye County. Despite the possible benefit to other residents, I don't think this is a financial burden our county could or should bear. I think the proponent should be confined to the property that they have currently requested for development. After all, they chose to place this project in the middle of our town and in a flood plain.

Since details of the actual onsite flood-control plan are not included, when will the actual Story Water Drainage Plan be created? Will public involvement be included in this process?

Responses to these comments are provided on a separate page following this comment document.

Dust

Comment No. 24-06

In section 4.1.1.1 the proponent states: ***Construction-related emissions...may cause some unavoidable, localized short-term impacts***. In the face of 30 operational years, construction may seem short term to the proponent, but for local residents who have to live with it day after day, more than three years of continuous construction activity is not short term. The proponent has created a model to try to forecast contaminant impacts. A model is only as good as the data put into it. Having been through Desert Center I would guess that it is similar to the desert environment in Amargosa. But the biggest factor in dust contamination is not the desert, but the wind. How similar are the wind patterns in Desert Center to those in Amargosa? For example, do they have a Big Dune? The very presence of a dune field indicated wind erosion is prevalent even in a natural, undisturbed environment. The predominant direction of wind in Amargosa is south to north, and northwest to southeast. Since the construction site is located west and north of the residential and community center area, this means fugitive dust will blow toward homes, school and other community activities at least part of the year. How is that impact going to be effectively mitigated?

Comment No. 24-07

I spoke with Lisa Christianson (BLM) after the public hearing portion of the meeting in Amargosa. I mentioned that I understood that there are surfactants used in industry that create a binding effect of surface materials to minimize wind erosion, but am concerned that walking on that surface (much less driving) will break that crust and open up the opportunity for windblown dust. She told me that at this point, the proponent would not be allowed to use conventional surfactants because there is no study that shows that they won't endanger the desert tortoise. Only water is approved

Comment No. 24-07 (continued)

for dust control at the present time. If studies are conducted to prove surfactants safe for the tortoise environment, they may be permitted in the future. This creates concern for me since water resources are important in our community (as stated earlier) and I wonder if the proponent considered this when they calculated their projected water usage. As stated before, we don't want a project approved that will come back later for more water. The EIS process should consider all possibilities for a project this size. So the final EIS should define water usage for dust control separate from other water uses, and what impact would water-only dust suppression have on fugitive dust emissions. What kind of dust suppression was used in the models that produced the figures given for fugitive dust?

Comment No. 24-08

I also have a problem with the math in their emissions model. Again, since three years is a long time to live with construction, I looked at Table 4-1 and 4-2. I am only focusing on dust here because I know what the wind is like, and believe it will blow away (effectively diluting) gas emissions before they could reach hazardous levels. They provide a table with daily maximum totals of PM_{10} and $PM_{2.5}$ values. If you total all three categories of PM_{10} emissions you come up with 466.7 lb/day and 132.6 lb/day of $PM_{2.5}$ emissions. If you multiply those values times 365 days and divide them by 2000 lbs/ton, you get 85.2 tons/yr PM_{10} emissions and 24.2 tons/yr $PM_{2.5}$. However, according to Table 4-1 the total maximum annual emissions are 54.5 tons/yr for PM_{10} and 15.4 tons/yr for $PM_{2.5}$. That equates to only about 64% of the amount calculated using the maximum daily totals. I would like to know why there is a discrepancy.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 24-09

Finding an unexplained discrepancy in the construction numbers, I attempted to evaluate the operating dust emissions as well. This is a little more complex as numbers are given in more detail by emission source and found in Tables 4-3 through 4-9. I deliberately evaluated motor vehicle emissions separately. If you multiply the PM_{10} and $PM_{2.5}$ maximum daily emissions values (given in lb/day) by 365 days and sum the values for all sources listed you get 2,259.4 lb/yr of PM_{10} and 2,188.5 lb/yr of $PM_{2.5}$. If you compare these with the annual averages emissions given in the same tables, you are given totals of 865.7 lb/yr of PM_{10} and 856.1 lb/yr of $PM_{2.5}$, around 38% of the calculated values. Now in these tables they use Average Annual values instead of Average Maximum values, so that may be the difference in this case, but I would still like an explanation of their results in the final EIS.

The one that has the greatest impact on operational emissions is motor vehicle activity. This includes motor emissions and fugitive dust from driving on unpaved roads. Now I'm not clear on why these figures are given as Maximum Daily Uncontrolled Emissions divided by Maximum Daily Controlled Emissions. It would be nice if sufficient explanation was given in the text to explain these units, especially since the model used to produce these estimates is not included in the Appendices. But taking the values at face value and totaling both emission sources from Table 4-10, I get daily emissions at 87.29 lb/day of PM_{10} and 18.63 lb/day of $PM_{2.5}$. When we multiply these by 365 days we get 31,859.4 lb/yr of PM_{10} and 6,801.4 lb/yr of $PM_{2.5}$. Comparing these numbers with the Average Annual values in Table 4-10 we find they report 13,014.6 lb/yr of PM_{10} and 6801.41 lb/day of $PM_{2.5}$, a reduction to around 41% of the directly calculated value. Again, clarification on this matter would be appreciated.

Comment No. 24-10

Now it is true that the dust production during operations will be less than dust production during construction, but I believe this has the potential to be a very onerous

Comment No. 24-10 (continued)

irritant to neighbors considering wind storms like I have seen in this valley. Therefore, I don't believe mitigation measures are adequate to reduce the impacts to a tolerable level, especially since we do not know all the assumptions used in the predictive model. It is not explained when the Air Quality Construction Mitigation Plan (AQ-1) will be prepared. Will public involvement be a part of that process? It also does not say when an operational dust control plan will be provided (AQ-4). Will public involvement be a part of that process? Will these plans be released prior to the BLM granting approval of a right-of-way for this project? Without any details at this time on how the proponent will effectively mitigate dust erosion, I would respectfully suggest that all routinely-traveled areas within the plant site and solar fields be paved with compacted gravel road base, including parking areas, and that all vehicular travel be confined to these areas except in event of an emergency. The abundance of fine-grained materials (fine sand, silt, clay and very fine-grained chemical precipitates) in the valley alluvium makes it an unsatisfactory road material that easily produces wind-blown contaminants. By placing gravel over the desert base and compacting it in place, the fine-grained contaminants are effectively covered and less available to wind erosion.

Comment No. 24-11

Whether it be required by the BLM as mitigation measures or be required as part of a state Air Quality permit, installation of air quality monitoring equipment is absolutely necessary to insure compliance with regulatory standards and to insure that modeling predictions were not understated. This includes immediate installation of equipment upon receipt of an approved right-of-way from the BLM to begin collection of baseline pre-development conditions. It is also necessary that monitoring costs be provided by the proponent as a condition of approving the right-of-way. Furthermore, punitive measures should be included in the permit if the proponent fails to achieve accepted air quality standards.

Responses to these comments are provided on a separate page following this comment document.

Community Impacts:
Noise

Comment No. 24-12

Next to dust, the greatest probably impact of this project on neighbors is noise. We have pretty quiet nights out here. It's one of the pleasures of the desert. So any analysis of noise impacts must consider the change in noise level from current ambient levels to the new levels that will be introduced. To take the EPA standards and say that they are OK does not consider the setting of this industrial site next to residents in a quiet rural community. Most folks in the valley don't have air conditioning since the extreme dryness provides good evaporative cooling which is more cost effective. But evaporative cooling is a positive pressure system which requires open windows (or doors) to work. So acoustical models must take into account that external noise will be audible indoors with little attenuation.

Comment No. 24-13

I'm not an acoustical engineer but I was involved with a mining project located in close proximity to residential areas. The situation is a little different in that no public lands were involved in the mining, but an EIS was prepared and the governing agency, in this case the county, imposed special noise limitations to protect the quality of life of neighboring residents. Noise limits were scaled based on time of day, reduced for evening, nighttime and weekends and were monitored 24-hours a day to insure compliance. So to refresh my memory on the subject I looked up some definitions. A decibel is a logarithmic unit of measure to express the magnitude of a physical quantity,

Comment No. 24-13 (continued)

in this case acoustical energy, relative to a specified reference level (Wikipedia). That reference level is usually taken to be the threshold of perception of sound to the average human. Being a logarithmic scale means every tenth decibel is a tenfold increase of acoustical energy. So the measurement of sound at 50 dB is ten times as much as 40 dB, and 60 dB is one hundred times louder than 40 dB. Furthermore, every three decibels represents a doubling of acoustical energy.

Comment No. 24-14

Construction noise levels will be short-term according to the proponent, but more than three years is not a short time to residents. Fortunately, most of the residents live on the east side of one planned power block so only the duration of construction of that site will significantly impact residents. They state that construction will be limited to the hours of 7:00 am to 7:00 pm (section 4.5.1.1). That would be fine if people don't mind noise with their dinner. I would suggest that it would be more appropriate to limit hours from 7:00 am to 6:00 pm <u>at the latest</u> during construction of the east power block so residents can eat dinner in the relative peace and quiet they are accustomed to. After a day at work who wants to come home to more noise?

Comment No. 24-15

Operational noise is more of a problem because it will go on 24-hours a day, 7 days a week (section 4.5.1.2). The have forecast operating noise levels at 54.7 dB at the eastern boundary closest to residents (Table 4-23). It is very important to define ambient noise levels as they exist now during day, night and weekends. If the desert nights currently average 40 dB of acoustical energy from existing sources, then a 55 dB limit represents 32 times more noise than residents currently experience (remember 3 dB = 2x energy). Another misrepresentation of noise is that 60 dB is equivalent to normal conversation. Actually, 60 dB is equivalent to conversation in a room full of conversing people. You have to stand close and focus to have a conversation with another person above the general noise level. 55dB is more representative of casual conversation with a small group (www.quiet.org). The problem with the EPA standard is that it is convenient to create a simple quantified standard but people are not simple and quantifiable. How may people want the sound level of two or three people talking outside their bedroom window?

Comment No. 24-16

Noise is not just a function of the amount of acoustical energy, but includes human perception and the type of noise (www.quiet.org). Industrial noise is not like howling coyotes or screech owls, either in type or duration. The type of industrial noise will intrude on neighbors simply because it hasn't been there before. You may think they will get use to it, and some may. But some may not. Sleep disruption is a serious detriment to overall health and well-being, and it is not fair to the local residents to ignore the human element in developing standards for this project. Most noise disturbs residents during the evenings and weekends. With continuous operations, this project never gives the residents a break. Therefore it is important to include more restrictive noise limits during these times in the interest of fairness to all parties involved. The proponent selected this site without involving the local residents in their plans, so they should bear any additional costs to make their operation liveable.

Comment No. 24-17

One issue that came up during planning for the mining project where I worked was backup alarms. These are required by OSHA/MSHA for protection of personnel. However, these devices fall into the more disruptive types of noise for local residents. The initial solution was to aim the backup alarm downward as much as possible to reduce the distance of sound travel to the immediate area which is where the hazard is

Responses to these comments are provided on a separate page following this comment document.

Comment No. 24-17 (continued)

located anyway. A new technology was later introduced that included a motion sensor on the device that only activated the alarm if a moving obstacle was identified. I don't know the current status of the industry as I have been out of mining for many years, but it is worth investigating since backup alarms are a nuisance noise.

Visual Impacts.

Comment No. 24-18

Scenic impacts to the community as a whole and the residential neighbors in particular are still a concern. I take exception to the statement in Table ES-1-4 under land use that ***No residential...land uses would be directly impacted by construction or operation of the proposed project*** (Section 3.11 and 4.11) when private property abuts the project on two sides. Their definition of impact and mine are not the same. Besides the aforementioned noise and dust impacts from both construction and operations, the mountain views will be replaced by industrial landscapes for local residents. Had the proponent selected a site at some distance from the center of town and local residents, everyone could have had the relatively unobtrusive view seen from Lathrop Wells (Fig. 4-6A) where only the dry-cooling units stand as out of place. Instead current residents on Sandy Lane and vicinity and potential residents along Valley View have their mountain views almost totally obscured by the proposed facility (Fig 4-8A and 4-9A). Personal so-called ornamental vegetation (we folks out here know it is primarily for wind breaks and associated shade) will help to shield the view for some, but the shear size of the project area will cause it to dominate the view shed in the 0-3 mile foreground zone. I also disagree that existing impacts (the current town and residential structures) will lessen the impact of the proposed project. The combined land area of all the existing structures (which are not densely developed) is 0.5 square miles. This project covers 6.8 square miles—hardly a reasonable comparison. A more realistic perspective is that the existing structures will not significantly impact the view of the proposed facility. And I would like to see a similar photo simulation from one of the residences on Anvil Road east of Powerline Road. I'm not convinced that the impacts will, in fact, be moderate to low (see Residences south of Amargosa Farm Road, p. 4-76). Also, these photo simulations don't represent how significant early morning / late afternoon reflection of sunlight might be on the nearest neighbors. That would be nice to know before the project is permitted.

Comment No. 24-19

Comment No. 24-20

They are right it predicting that distance from the facility will reduce its visual impact from other vantage points. The presence of a wind fence does seem to help blur the industrial angles of the solar array, but it is still an artificial disruption to the landscape. The proponent has noted the benefit of existing ornamental screening. I think it would be helpful for them to investigate the cost and water consumption of planting trees of reasonable size along the portion of the fence directly adjacent to residents. If planted at the outset of fence installation (which is needed for security reasons) and with three years of construction lag-time, trees could be well on their way to providing a more natural screen for industrial activities that would also be consistent with other developed sites around the valley. Note that although Tamarisk (Athels) is a common windbreak tree in the valley because of rapid growth, it is a non-native invasive that aggressively seeks out water and damages structures. It would not be a good choice for this application.

Responses to these comments are provided on a separate page following this comment document.

Dark Sky

Comment No. 24-21

My last comment touches on visibility of the night sky. I had never seen the milky way before I moved west, and it is awesome. Despite the ominous glow of Las Vegas that silhouettes Mount Charleston at night, we have superb night visibility in our valley. I'm glad that the proponent plans to minimize light pollution in an effort to protect this resource. Specifics, however, were lacking and general words like "consider" and "practicable" (Appendix A-9 VIS-4) were not very reassuring. They state that their nighttime lighting ***will be slightly brighter than the nearby developed gravel operations, which are the brightest point-source of nighttime lighting in the project area*** (Section 4.12.2.1). It is unclear to me what quarry they are referring to since the local quarry doesn't have nighttime operations. If they are referring to the Cind-R-Lite facility north of Highway 95, it may be the only comparison, but it isn't a very good one. They have nighttime lighting at the plant site but the footprint of their project is about 420 acres, about a tenth the size of the proposed solar facility. Just as visual impacts are reduced by distance, the Cind-R-Lite facility is over 7 miles from local residents. I don't have to remind you how close the proponent's project is to residents, and their nighttime activities which are necessary to their operation (mirror washing) will impact the local view of the night sky. So a little more detail is necessary to evaluate how significant those impacts will be.

Responses to these comments are provided on a separate page following this comment document.

General Discussion

Comment No. 24-22

It was noted in the initial scoping sessions that this project did not have to be in the middle of our town (Table 1-7 Lands and Realty) and could have been sited farther from existing land uses. The proponent chose to put this project in close proximity to residents and the center of community services in our town which most residents in the valley use to some degree or another, be it the library, community functions at the community center or park, the medical clinic or the school. In section 1.4.3 the proponent described their objectives, which included:

- **Minimize** environmental impacts, infrastructure needs, and **costs** by locating the plant **near existing infrastructure**, such as a transmission line, a substation, an adequate water supply, and highways/access roads, and by using designated corridors to the maximum extent possible
- Develop a solar thermal energy facility that will qualify for, and benefit from, the **ARRA Grant Program**

Now I understand a business trying to minimize costs. And I can understand trying to capitalize on a government handout like the ARRA Grant Program. But in their greed to get as close to a transmission line as possible, and as close to available water rights as possible, they completely ignored their impacts to the local community. They felt that the promise of jobs and tax revenues would make everyone welcome their project with open arms. They were surprised that the community came out in force at the scoping meeting against this project once we saw the details of how the center of our community would be changed, and how our neighbors that lived adjacent to the site would be treated. The proponent has no idea how important quality of life is to our community. There are many places we could live that provide higher wages and more support facilities from a larger tax base, but we choose to live here.

Comment No. 24-23

Now I'm sorry if they think that the conditions we want placed on this project to protect our quality of life are economically burdensome. But they chose this site we didn't. The homes on Sandy Lane and their neighbors didn't suddenly appear after Solar Millennium announced their intentions. We didn't throw up a school, library, medical clinic, cemetery, park and community center to stand in the way of progress. This project is applying for use of public land for something Washington, D.C. has decided is a priority. The project proponent is pushing hard to get this project started so they can cash in on the ARRA carrot. But the public land belongs to everyone, and their plans should not create undo hardship on surrounding stakeholders. As the lead agency in reviewing this proposal, the residents of Amargosa are looking to you, the BLM, to protect our community with solid mitigation requirements to minimize all the impacts to our environment. We don't need hollow platitudes that look pretty on paper but do nothing to provide accountability and consequences for failure to achieve accepted standards of compliance. If this right-of-way permit is to be granted, please include reasonable mitigation requirements to protect the residents of Amargosa Valley.

A response to this comment is provided on a separate page following this comment document.

Sincerely,

Genne M Nelson
P. O. Box 258
Amargosa Valley, NV 89020
775-372-1552

RESPONSES TO COMMENT NO. 24-01 THROUGH 24-23

Response to Comment No. 24-01

The BLM's preferred alternative is the Proposed Action (dry-cooled alternative).

Response to Comment No. 24-02

Solar Millennium has filed an application with the Nevada State Engineers Office to change the place and manner of use of an existing certificated water right near the Project site. The water right has an annual duty of 603 afy which has been pumped approximately 413.88 afy on average over the last 25 years. Solar Millennium's water requirements during operation is 400 afy. To allow for redundancy should one of the wells fail, Solar Millennium intends to drill a new well and move the point of diversion to a location just west of the current well. Meters will be placed on both wells to ensure there is no exceedance of the permissible annual duty.

The change in manner of use of the existing water right from irrigation and agriculture to industrial may result in a loss of groundwater recharge to the basin. The best available literature indicates that recharge due to agricultural practices in Amargosa Valley ranges between 9 and 22% (Stonestrom et al. 2007). The primary water uses during operations would be for washing solar mirrors, ancillary equipment heat rejection, and the power cycle. It is unknown what amount of infiltration occurs as a result of washing solar mirrors, and the other uses will not have any infiltration associated with them.

Response to Comment No. 24-03

As cited in Table 2-4, the amount of water required for dust control is anticipated to be 45 afy. This quantity of water, which include RO discharge water, has been accounted for in the estimated operational water requirement of 400 afy

Response to Comment No. 24-04

Solar Millennium has filed an application with the Nevada State Engineers Office to change the place and manner of use of an existing certificated water right near the Project site. The water right has an annual duty of 603 afy which has been pumped approximately 413.88 afy on average over the last 25 years. Project water needs during construction will be about 600 afy; during operations it will be 400 afy. Water would be sourced from the one well. Potential effects to local water users has been added to Section 4.4.2.1

Response to Comment No. 24-05

A coordinated regional flood plain approach for the area was pursued jointly with BLM, Nye County and adjacent solar company right-of-way applicants. All parties agreed to the positive pursuit of the approach, however coordinated funding, schedule variations and design responsibility for such a facility was determined to be an overwhelming challenge at this point in time. Therefore the alternative of providing a regional detention basin north of US 95 is an unlikely venture and the Project is proposing independent flood protection.

A Conceptual Stormwater Control Plan was prepared for the project site and submitted to BLM as part of the Plan of Development. The plan included conceptual evaluation of on-site flood control.

Response to Comment No. 24-06

The most recent version of AERMOD (Version 09292) was used. AERMOD is the model preferred by U.S. EPA and NDEP for the types of site, emission source, and regional terrain features of the Amargosa Farm Road facility and the Amargosa Valley region.

Before the DEIS was issued there was no site specific air modeling for this Project, therefore, air quality data from a similar project in a similar location was utilized (Palen Solar Project). After the DEIS was issued site specific modeling was completed and has been included into the FEIS. The air quality data in the FEIS includes more relevant data based on site specific conditions and expected impacts from construction and operation of the proposed Project. Because the site specific modeling has been completed there is no reason to further research the similarities of wind patterns in Amargosa Valley to those in Desert Center in this EIS.

Dust monitoring stipulations will be determined by the Nevada Department of Environmental Protection - Bureau of Air Pollution Control (NDEP-BAPC). Before construction can commence on the project site a Surface Area Disturbance Permit must be obtained, and within it a Dust Control Plan must be developed that includes best practical methods of fugitive dust control to be used by the permittee to control fugitive dust in detail. NDEP-BAPC has complete regulatory authority over projects in this location considered to be minor sources with regard to air emission control and monitoring.

Response to Comment No. 24-07

The water requirements for both the dry- and wet-cooled alternatives are cited in Table 2-4. The BLM acknowledges that at present, conventional surfactants are not allowed to be used in desert tortoise habitat. There are ongoing studies analyzing effects of various surfactants on desert tortoise and their habitat. The BLM will work with the Proponent to achieve a workable solution to this issue. Under any such solution, no surfactants will be used that would result in adverse impacts to desert tortoise.

Response to Comment No. 24-08

The most recent version of AERMOD (Version 09292) was used. AERMOD is the model preferred by U.S. EPA and NDEP for the types of site, emission source, and regional terrain features of the Amargosa Farm Road facility and the Amargosa Valley region.

Response to Comment No. 24-09

See response to Comment No. 24-08.

Response to Comment No. 24-10

See response to Comment No. 24-06.

Response to Comment No. 24-11

See response to Comment No. 24-06.

Response to Comment No. 24-12

In the absence of Nye County and Nevada State noise code regulations, the EPA 55 dBa noise code threshold was adopted and applied to the project. The study is to determine appropriate noise levels at project property lines. Regulations at a property line account for proper noise reduction to residential structures.

Response to Comment No. 24-13

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 24-14

The requested change is subject to review and acceptance by the Developer, Solar Millenium, as NEPA is a purely procedural status and cannot require substantive outcomes. Evaluation of construction schedule at the eastern power block must be reviewed to determine if a 1-hour reduction will unreasonably affect construction schedule.

Response to Comment No. 24-15

Please refer to Comment No. 02-10-03. Acoustic energy as perceived by a human is referenced as a 10 dB difference - which is perceived as a doubling of the energy. Therefore a 15 dB difference is perceived as a little more than doubling of the energy. 60 dB is defined as normal human speech at 3 feet.

Response to Comment No. 24-16

This comment alludes to the discussion regarding acceptable property line ambient noise level conditions. In the absence of Nye County and Nevada State noise code regulations, the EPA 55 dBa noise code threshold was adopted and applied to the project. Our analysis is conditioned that most of the operational noise will occur during the day time hours. A defined property line noise regulation will assist in the reduction of interior residential noise.

Response to Comment No. 24-17

Safety protocol and noise regulations will be complied with at all times during construction and operation of the facility. 20 CFR 1926 requires backup alarms on certain types of vehicles - the noise associated with the alarms helps ensure safety for workers, and for people located within the vicinity.

Response to Comment No. 24-18

The FEIS states that when the project would be seen in the context of the existing structures that are similar in form, line, color and texture the impacts would be reduced. The EIS states that the impacts are high for sensitive viewers in the foreground with level, unobstructed views. The impacts further address the scale and dominance of the project to viewers in the foreground (Section 4.12.3.1 Project Contrast).

Response to Comment No. 24-19

The KOPs in the FEIS represent typical viewers and viewing distance zones. The KOP locations were selected by the BLM visual resources staff to represent typical conditions and impacts in Amargosa Valley.

Time-of-Day impacts are addressed in Section 4.12.3.1, in regards to the relationship of the sensitive viewers from the solar array. In this regard, high impacts to sensitive viewers with unobstructed views of the Project are disclosed.

Response to Comment No. 24-20

Although the wind fence is an introduced element to the landscape, it is considered a mitigation measure in part as it was proposed to decrease the visibility of the solar arrays in addition to mitigate wind effects to the solar arrays.

Comment noted regarding planting trees.

Response to Comment No. 24-21

Comment noted. The FEIS has been updated as appropriate to correctly identify the gravel facility mentioned in the DEIS to the Cind-R-Lite plant. Facilities operational hours are 6am-3pm, but plant operates 30+ lights (mixture of security, sign lighting, and pole lighting) from sundown to sunrise (per phone conversation with Cind-R-Lite facilities manager). Additionally, the FEIS has been updated to provide more detail in the efforts to minimize light pollution.

Powerblocks are the only facility to light up at night. The current design has each powerblock site at approximately 2,500 ft x 490 ft = 1,225,000 square feet (28.12 acres; total of 56.24 acres).

Response to Comment No. 24-22

Comments noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 24-23

In addition to BLM required mitigation measures, a Development Agreement has been made and entered into by and between Nye County and Solar Millennium to ensure the land use impacts on public services in connection with the proposed Project are mitigated. The goal of the Development Agreement is to "promote the health, safety, and general welfare of the County and its inhabitants, to minimize uncertainty in planning for and securing orderly development of the Property and surrounding areas, to insure attainment of the maximum efficient utilization of resources within the County in a way that provides the highest economic benefit and least fiscal cost to its citizens, and to otherwise achieve the goals and purposes for which the laws governing development agreements were enacted." A copy of the approved Development Agreement between Nye County and Solar Millennium is provided in Appendix F.

The FEIS contains a full environmental review of the proposed Project's likely impacts and identifies measures to avoid and mitigate those impacts where possible. Similar avoidance and mitigation will take part as a result of the Section 7 consultation process between BLM and the U.S. Fish & Wildlife Service under the federal Endangered Species Act. Plans with additional measures, such as lighting and stormwater control plans, will help serve the same function.

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May 3, 2010

FAX

TO:	BLM, Greg Helseth 702-515-5023
PAGES:	6
SUBJECT:	Comments, Draft EIS, Solar Millenium, LLC Project
FROM:	Ryan Corrigan FAX 775-828-1533

See attached 5 pages

Alternatives

Comment No. 25-01

The EIS describes a new concept/configuration for the Project described as the Dry Cooled Alternative. This alternative substantially alters the design, visual effect and noise level of the Project. This new proposal has never been included as an alternative in the scoping process, as required by BLM regulations. This alternative must be withdrawn from consideration until interested parties have the opportunity to provide comments, and those comments are incorporated in a draft EIS. As it now stands, the draft EIS was prepared without knowledge of any such comments. Just as the public has the obligation to adhere to the administrative process, so to should the BLM be bound by their own regulations. (ES-1.4.1 page ES-8)

Area of the Project

Comment No. 25-02

The Alternative described at ES-1.4.1 states that 6320 acres have been applied for, of which 4350 acres would include actual use (solar fields, power blocks, office, maintenance, parking, lay down, stormwater detention basin and switchyard).Table ES-1-2 describes only 4087.11 acres for the above purposes, which apparently includes the entire project. There is no justification presented for releasing an additional 2000 acres, which includes land across the street from residents and the Senior Center, and land surrounding the town park. (Figure ES-2) Release of this additional land without public input or knowledge of its proposed use violates the BLM tenet of "Best Use". The application for this excess land should be denied.

Size and Shape (ES-1.4.4)

Comment No. 25-03

Although scoping comments urged consideration of an alternative footprint to provide an increased buffer between the Project and Sandy Lane residents, this alternative was totally disregarded with no explanation or justification.

Project explanations that a reduction in area would not be economically feasible are not valid. The selection of the dry cooled alternative would result in an overall annual reduction in output of 5% (page ES-10)

I am again proposing an alternative that would increase the buffer between the Project and Sandy Lane by selecting the wet cooled alternative and by reducing the mirror field in the south east corner (East edge from Farm Road to Frontier Road) by a size that would result in a reduction of no more than 5% of output. This alternative would provide a positive step in mitigating the recognized negative impacts on the residents on Sandy Lane.

Responses to these comments are provided on a separate page following this comment document.

Fire Protection

Comment No. 25-04

Fire protection measures are discussed at 2.3.9, page 2-31. A glaring omission from the procedures relating to fire protection is the very real possibility of a catastrophic fire. Extensive evidence of the possibility of such an occurrence was provided during the scoping process, including photos of the catastrophic fire at Daggett, CA. Yet, there was absolutely no mention of this event, or the possibility that the Project could have such an experience. Any EIS related to this project has an obligation to address this most urgent public concern, and to describe the potential dangers to adjacent residents. These should include at least the potential spread of the fire, heat and smoke damage, harmful toxic fumes, and evacuation procedures. This is the first solar power plant using fluids heated by mirrors that is located within yards of residents.

Planned Land Use 3.11.4

Comment No. 25-05

This section describes the Amargosa Valley Area Plan, including the specification of a .25 mile Open Space Parks and Trails land use designation between residential areas and the area where the project is located. (page 3-127) No justification is provided in the EIS for disregarding this provision, a provision approved by a majority of the residents of Amargosa Valley. I am not surprised greedy Nye County politicians would ignore the ROI, but I would expect more integrity from a federal agency charged with fairly administering land disposition, and expect BLM to stand by their stated objective of considering affected residents.

Visual

Comment No. 25-06

KOP / Simulation 1 – View facing West from Sandy Lane residence accurately describes the overall impact to be High/moderate. The view described includes a semi-transparent wind fence, the first row of solar collectors and potentially the tops of the power block. This detail fails to describe the enormity of the view, both the height, 30 plus feet, and the length, almost as far as the eye can see in each direction. The sheer size of the project was not adequately considered. The wind fence itself, is a visual impairment. The existing trees on residential property will not adequately obscure this visual impairment.

Because BLM has designated the setting as VRM Class IV, there are only minimal requirements for mitigation. The designation of VRM Class IV was a subjective classification performed by a person, or persons, obviously influenced by personal prejudices against a desert setting. Those of us who are native to the desert have an entirely different point of view. While the BLM in this instance saw only monotonous plants, someone who appreciates the desert sees a living, tranquil landscape teeming with desert wildlife. We chose to live here because of the beauty of the desert, not in spite of it. The VRM rating of Class IV is arbitrary and capricious. At a minimum, BLM has an obligation to consider location alternatives to lessen the visual impairments.

Responses to these comments are provided on a separate page following this comment document.

Noise

Comment No. 25-07

After wading through all the technical jargon relating to the measurement of the noise levels, it appears the analysis of the data collected is seriously flawed. My discussion is limited to the Eastern property line (Sandy Lane). The level of dBA, Ldn from operations at the Eastern property line is projected to be 54.7. (Table 4-23, page 4-33) The existing 24 hour average of dBA, Ldn is 39.7. (Table 3-11, page3-49).

The study neglects to consider the cumulative effect of adding newly created operational dBA's to the existing ambient noise level. The result, if combined, would total 94.4 dBA, Ldn, a level resulting in hearing loss per Table 3-8, page 3-46. This noise level would also exceed the EPA standard of 55 dBA (page 4-29) This level also exceeds the noise exposure limit of 90 dBA as described by OSHA. (page 4-35).

The noise study is further flawed by computing the 24 hour average of combined noise levels for existing noise. (Table 3-11, page 3-49) An average of noise levels is not an accurate measure of the impact of sounds heard by residents. First, it does not filter out pleasant sounds, (breeze through the trees, birds chirping, crickets at night). Secondly, noise levels in this rural setting are intermittent, not constant. Sound occurs in spikes of increased decibels and audible sound, generally lasting only seconds, followed by valleys of relative quiet, often for extended time periods. It is much easier to tolerate brief increases in sound level (aircraft overhead, vehicles passing by on the gravel road, large trucks on Farm Road, etc) if followed by extensive periods of relative quite.

The 24 hour ambient noise level is not comparable to the continuous noise level that will be generated by the Project. There will be no more periods of relative quiet, a factor having a direct bearing on the socioeconomic impact on residents.

In Section 4.5.4, page 4-36, the draft EIS concludes no mitigation for noise will be required. This conclusion is erroneous, based on the unreliable analysis of data as related above. At a minimum, a hearing conservation plan is required for both workers and residents.

Responses to these comments are provided on a separate page following this comment document.

Snakes

Comment No. 25-08

Scoping comments included fears by adjacent residents that disturbing such a huge area of desert would cause a migration of venomous snakes to their residences. There is no mention of this issue in the draft EIS. This issue was discussed with the biologist that performed surveys for the Project. Based on local observations, 5 to 10 sidewinders per acre is a realistic estimate. Disturbing over 4000 acres could result in potentially 20,000 to 40,000 sidewinders looking for a home. The solution for this issue is a silt fence that prevents such a migration, and is required in California for similar projects. I urge BLM to investigate this danger and to consider appropriate mitigation.

Toxic Fumes from Heating Fluid

Comment No. 25-09

Scoping comments also described concerns for health effects from heating fluid leaks and spills. Research at other solar trough plants identified the issue of adverse respiratory effects on workers dealing with "oil" leaks and spills. The draft EIS fails to even mention this issue. Adjacent residents are concerned as to the volatility of such fumes, and the effect on nearby homes , pets, and livestock by airborne fumes. A study of this potential hazard must be included in the EIS.

Socioecomomic

Comment No. 25-10

The draft EIS analysis of this issue consists primarily of a recitation of demographic statistics. This approach is outdated. Current literature defines this discipline in a much broader context, including the evaluation and measurement of the social impact some sort of economic change has on the way people behave, how they choose to spend their time, and the overall quality of life. Intangible factors such as personal dignity, personal safety, fear from physical harm, and additional similar factors are studied and rated.

I urge the BLM to employ a competent subcontractor in this highly specialized field, such as a PhD from Nevada university environmental studies departments, to design and conduct a proper study . The current description of socioeconomic issues in the draft EIS is woefully inadequate.

Responses to these comments are provided on a separate page following this comment document.

Summary

Comment No. 25-11

The overall impression of the draft EIS is that it is a rush job prematurely issued. It contains a number of "we're going to's". The following are a few examples:

A.1, AQ-1:	"Project...will develop an Air Quality Mitigation Plan..
A.2 , GEO-1	....will provide guidance for mitigation of geological hazards...
A.4, WTR-1	...Project will develop ...approved construction phase SWPPP
A.6, VEG-5	...Noxious weed plan will be developed...
A.9, VIS-2	Vague as to landscape mitigation. 30' evergreen trees?
A.9, VIS-4	Lighting : Vague as to requirements, no specific standards or plans, no time constraints, no description of height, no limits on lumens.
HAZ-3	Need to publish list of EPA contacts so residents can also monitor compliance
Haz-6	Project will develop spill response procedures (no mention of fumes.)

How can the EIS be fully evaluated when so many issues are incomplete.

Lack of adequate consideration of the issues raised in these comments will most certainly provide a basis for appeal.

Respectfully,

Ryan Corrigan
HCR 69, Box 426D
Amargosa Valley, NV 89020

RESPONSES TO COMMENT NO. 25-01 THROUGH 25-11

Response to Comment No. 25-01

Solar Millennium's Plan of Development identified both a dry- and wet-cooled alternative. The selection of the appropriate technology would be based on additional studies and public and agency consultation. This information was provided to the public during Scoping.

Response to Comment No. 25-02

The Proponent's decision to release a portion of the lands from further consideration was based upon refinement of the Project layout following surveys conducted in the spring of 2009. The lands released from further consideration are shown on Figure ES-2 and Figure 1-2.

Response to Comment No. 25-03

Reasons why a smaller footprint would not be feasible are described in sections ES-1.4.4.1 and 2.2.1.1

See also response to comment 20-10.

Response to Comment No. 25-04

See Section 2.3.8 (Fire Protection). Fire Safety Compliance Certification must be obtained from Nye County. Fire protection training will be given to on-site personnel and at least four (4) individuals identified by the county annually per the Development Agreement. A Construction Fire Protection and Prevention Plan will be developed and followed throughout all phases of construction. The permanent facility fire protection system will be put into use during construction as soon as is practicable. Prior to the availability of this system, fire extinguishers and other portable fire-fighting equipment will be available on site. All equipment will be Occupational Safety and Health Administration (OSHA) compliant. Locations of portable firefighting equipment may include portable office spaces, welding areas, flammable chemical areas, and vehicles and other mobile equipment.

Response to Comment No. 25-05

Local land use plans do not apply to federal lands, including the lands on which the proposed Project would be located. Rather, BLM must comply with the requirements set forth in the Federal Land Policy Management Act (FLPMA). Nevertheless, BLM has coordinated with Nye County in an effort to ensure synchronicity between the Project and local land use planning.

In addition, a Development Agreement has been reached and entered into by and between Nye County and Solar Millennium to ensure the land use impacts on public services in connection with the proposed Project are mitigated. The goal of the Development Agreement is to "promote the health, safety, and general welfare of the County and its inhabitants, to minimize uncertainty in planning for and securing orderly development of the Property and surrounding areas, to insure attainment of the maximum efficient utilization of resources within the County in a way that provides the highest economic benefit and least fiscal cost to its citizens, and to otherwise achieve the goals and purposes for which the laws governing development agreements were enacted." A copy of the approved Development Agreement between Nye County and Solar Millennium is provided in Appendix F.

Response to Comment No. 25-06

The simulation as presented in the FEIS depicts what the human eye would see. The photograph was taken using a 50-mm lens and a 45 degree viewing angle, which is an approximation of what the human eye sees (excluding peripheral vision). The impacts are based on the full scale of the Project and include all of the Project elements in the assessment. Although the wind fence is considered a partial mitigation measure, its effects to impacts were considered as well.

The BLM uses a team approach, which draws from various resource specialists (i.e., geologist, biologist, etc.) trained in VRM so that the determination is based on group consensus, not individual opinion. In this regard, one discipline does not have a majority voice in the decision. The Class IV designation came from this group consensus.

Response to Comment No. 25-07

This comment is not mathematically valid. The cumulative effect is derived by adding the values on a logarithmic scale, not a simple additive linear scale. Ambient noise conditions are typically measured over a 24-hour period using the CNEL, LEQ, or LDN metric. Currently, the applied EPA guidelines only allow for the 24-hour average noise levels for land use compatibility at project property lines. Ambient conditions are collected to capture and define all community and surrounding activities to include roadway, aircraft, and mechanical noise, also wildlife. These are defined as typical noise levels impacting the residential community. The facility's operation at night will be very limited, meaning that noise levels will approximate nighttime ambient noise conditions. If revised noise regulations were enacted, then the Developer would be required to evaluate nighttime equipment operations for potentially

necessary or desirable changes. Based on the EPA and OSHA requirements at time of study, it was concluded that no mitigation is required.

Response to Comment No. 25-08

The BLM is unsure how the estimate of 5 to 10 sidewinders per acre was derived. Studies show that sidewinder densities are typically no more than 1 individual per hectare (R.S. Reiserer. 2001. Evolution of life histories in rattlesnakes.). Surveys of the entire site found 5 sidewinders and no other venomous snakes. As such, impacts from movement of venomous snakes are not anticipated. Requirements for projects in California are not applicable in Nevada.

Response to Comment No. 25-09

All workers will be required to wear the appropriate forms of personal protection equipment at all times. Volatile organic compounds (VOC's) will be regulated and limits will be enforced by NDEP-BAPC.

Response to Comment No. 25-10

The University of Nevada at Reno was retained to validate and update information included in the Socioeconomic section of the FEIS.

Response to Comment No. 25-11

In order to obtain various agency approvals and permits, Solar Millennium is required to prepare site-specific plans with its right-of-way application. For example, a Stormwater Pollution Prevention Plan (SWPPP) must be prepared prior to obtaining a Stormwater Discharge Permit. These plans must be developed based on final engineering design.

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NATIONAL SYSTEM OF PUBLIC LANDS

Solar Millennium LLC

COMMENT FORM

Amargosa Farm Road Solar Energy Project

Draft Environmental Impact Statement

ED BOOSS
Name — Organization (if applicable)

PO Box 13 — Amargosa Valley — NV — 89020
Address — City — State — Zip Code

Add to Mailing List: YES [X] NO [ ] Withhold personal information: YES [X] NO [ ]

Comment No. 26-01

COMMENT:
THE PLAN TO PUT SOLAR MILLENIUM OR ANY PROJECT IN THE 40 MILE WASH DRAINAGE AREA IS IRRESPONSIBLE. THIS PROJECT SHOULD BE RELOCATED TO THE NORTHWEST WHICH WOULD PUT IT NORTH OF THE BOUNDARY CANYON FAULT TO PROTECT THE UNDERGROUND AQUIFER IN CASE OF A PROBLEM. THE WATER IS ABOUT 50' DEEPER BUT IN THE SAME SOIL STRUCTURE AS THE PRESENT LOCATION. THE SURFACE FLASH FLOOD POTENTIAL IN THE NEW LOCATION IS NEGLIGIBLE — IN 40 MI WASH IT IS MAJOR. IN THE EARLY 1990, A FLASH FLOOD SEVERELY DAMAGED VALLEY VIEW AND AMARGOSA FARM ROADS AS WELL AS SOME STRUCTURES — THE WAS FLOW FROM THE WEST CHANEL. THE PLANNED RETENTION & RUNOFF/DRAINAGE AREAS ARE INADEQUATE FOR SUCH A FLOOD. NOW THERE ARE NEW SUBDIVISIONS THAT THE FLOOD WATERS WILL IMPACT. WITH THE WATERS BEING DIVERTED IT WILL BE POSSIBLE TO HAVE A DISASTEROUS EVENT AT THE ELEMENTARY SCHOOL NEXT FLOOD. MOVE THE PROJECT SITE -- THEY CAN STILL ACCESS EXISTING ELECTRIC TRANSMISSION LINES FROM THE NEW SITE, WITHOUT ALL OF THE FLOOD DANGER.

(Use additional sheets as needed.)

Response to Comment No. 26-01
The Project site is considered suitable for development of a solar power facility due to its solar radiation potential and flat terrain, despite the challenges posed by stormwater runoff potential. Impacts to and mitigation concerning Fortymile Wash are discussed at length in Chapter 3 and 4.
The flood that occurred in 1969 generated 3,330 cfs of stormwater runoff measured at the gage station just upstream of US 95. The floods that occurred in 1995 and 1998 generated 1,200 cfs and 340 cfs measured at the same gage station. The Solar Millennium project site has been designed with perimeter flood control facilities to accommodate the 100-year storm event flow determined to be approximately 9,600 cfs. The proposed stormwater plan will not increase flooding of surrounding properties in that it proposes the stabilized release of intercepted storm flows to historic locations in both quantity and manner.

Public comments must be postmarked by May 3, 2010

SEND COMMENTS TO:
Gregory Helseth, Las Vegas Field Office, 4701 N. Torrey Pines Drive, Las Vegas, NV 89130

Copies of comments will be available for public review at the local BLM office during regular business hours. Individuals requesting their personal information be withheld from public review or from disclosure under the Freedom of Information Act must check "Yes" in the appropriate box. Such requests will be honored to the extent allowed by law.

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California Office
1303 J Street, Suite 270 | Sacramento, CA 95814 | tel 916.313.5800 | fax 916.313.5810
www.defenders.org

May 3, 2010

Gregory Helseth
Pahrump Field Office
Bureau of Land Management
4701 North Torrey Pines Drive
Las Vegas, NV 89130-2301
Via email to: solar_millennium@blm.gov

Re: Comments on the Draft Environmental Impact Statement for the Solar Millennium Amargosa Farm Road Solar Power Project, Nye County, NV, 75 Fed. Reg. 13301 (Mar. 19, 2010)

Dear Mr. Helseth:

Thank you for the opportunity to submit comments on the Draft Environmental Impact Statement (DEIS) for the proposed Amargosa Farm Road Solar Energy Project. These comments are submitted on behalf of Defenders of Wildlife ("Defenders"), a non-profit public interest conservation organization with over 1,000,000 members and supporters nationally, 100,000 of whom are in California.

Defenders is dedicated to protecting wild animals and plants in their natural communities. To achieve this end, Defenders employs science, public education and participation, media, legislative advocacy, litigation, and proactive on-the-ground solutions in order to impede the accelerating rate of extinction of species, associated loss of biological diversity, and habitat alteration and destruction. Defenders submitted issue scoping comments for the proposed project on August 11, 2009.

The proposed project would entail the exclusive use of 4,350 acres of public land for the construction, operation, and eventual decommissioning of a concentrating solar-thermal power generation facility. Power would be generated from two 232 MW dry-cooled solar power plants equipped with thermal energy storage. The site of the proposed project is located immediately east of Death Valley National Park, north of Death Valley Junction, and approximately 15 miles northwest of the Ash Meadows National Wildlife Refuge.

As we transition toward a clean energy future, it is imperative for our future and the future of our wild places and wildlife that we strike a balance between addressing the near-term impact of large scale solar development with the long-term impacts of climate change on our biological diversity, fish and wildlife habitat, and natural landscapes. To ensure that the proper balance is achieved, we need smart planning for renewable power that avoids and minimizes adverse impacts on wildlife and wild lands.

National Headquarters
1130 17th Street, N.W.
Washington, D.C. 20036-4604
tel 202.682.9400 | fax 202.682.1331

We strongly support renewable energy production and utilization, but we do not consider the construction of large-scale projects, and especially the very large solar energy projects proposed on public lands throughout southern Nevada and the adjacent California Desert Conservation Area, to be the primary way to meet our renewable energy goals. We believe such large scale solar projects must be located on degraded or disturbed land such as abandoned agricultural fields, industrial sites, and near existing structures before public lands containing natural plant and animal communities are considered.

Our comments on the DEIS are as follows, arranged by subject:

Comment No. 27-01

I. NEPA

Purpose and Need: The range of alternatives analysis is "the heart of the environmental impact statement." 40 C.F.R. § 1502.14. The National Environmental Policy Act ("NEPA") requires BLM to "rigorously explore and objectively evaluate" a range of alternatives to proposed federal actions." *See* 40 C.F.R. §§ 1502.14(a) and 1508.25(c). In specifying their EIS obligations under NEPA, federal agencies must "specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action." 40 C.F.R. § 1502.13. Agencies may not "contrive a purpose so slender as to define competing 'reasonable alternatives' out of consideration (and even out of existence)." *Simmons v. U.S. Army Corps of Eng'rs*, 120 F.3d 664, 665 (7th Cir. 1997). Nor may agencies "define the objectives of its action in terms so unreasonably narrow that only one alternative . . . would accomplish the goals of the agency's action, and the EIS would become a foreordained formality." *Citizens Against Burlington v. Busey*, 938 F.2d 190, 196 (D.C. Cir. 1991) cert. denied 503 U.S. 994 (1991).

Bureau of Land Management Purpose and Need: According to the DEIS, the stated purpose and need for the proposed project is to:

> ...respond to the Proponent's application under Title V of the Federal Land Policy and Management Act (FLPMA) (43 U.S.C. § 1761) for a right-of-way grant to construct, operate and decommission a solar thermal generation facility and associated infrastructure in accordance with FLPMA, BLM right-of-way regulations, and other applicable federal laws.

Department of Energy Purpose and Need: According to the DEIS, the stated purpose and need for proposed action is "...to comply with its mandate under the EPAct by selecting eligible projects (potentially suitable for funding support) that meet the goals of the EP Act." (DEIS at 1-4).

Rather than presenting a purpose and need statement that reflects the larger goal of providing for the development of solar energy, and then evaluating different means to achieve that goal, the Bureau of Land Management ("BLM") has instead defined the Amargosa project and other infrastructure construction itself as the goal. By so radically narrowing the scope of the project's purpose, BLM has impermissibly constricted the range of alternatives considered. *See Carmel by the Sea v. U.S. DOT*, 123 F.3d 1142, 1155 (9th Cir. 1995).

A response to this comment is provided on a separate page following this comment document.

Comment No. 27-02

Project Alternatives: In addition to properly defining the purpose and need of an agency action, agencies must consider a range of reasonable alternatives to the agency action in the EIS. *See* 42 U.S.C. § 4332(2)(E). The purpose of this requirement is "to insist that no major federal project should be undertaken without intense consideration of other more ecologically sound courses of action, including shelving the entire project, or of accomplishing the same result by entirely different means." *Environmental Defense Fund v. Corps of Engineers*, 492 F.2d 1123, 1135 (5th Cir. 1974); *Methow Valley Citizens Council v. Regional Forester*, 833 F.2d 810 (9th Cir. 1987), rev'd on other grounds, 490 U.S. 332 (1989) (agency must consider alternative sites for a project). The BLM analyzed two alternatives: the proposed action and the no action alternative. The failure to provide meaningful alternatives violates NEPA.

Such a truncated alternatives analysis violates the agency's duty under NEPA to fully review "all reasonable alternatives." The EIS must analyze project alternatives including: (1) site alternatives, including development on private lands and (2) alternative technologies.

BLM appears to have severely limited consideration of what constitutes a reasonable alternative by adopting the requirement that the project size, location, technology, site control and overall cost efficiency conform to the applicants desires. This is very troubling. In fact, BLM rejected three alternative sites selected by the project applicant because they did not meet the site criteria identified in the DEIS which were developed by the applicant. Apparently projects of smaller size(s) were not considered because they did not meet the applicant's criteria that at least 4,000 contiguous acres be available to support two 232 MW powerplants. The following paragraph from the alternatives section of the DEIS illustrates our concern with BLM's approach with regard to reasonable alternatives:

> *The Proponent also considered the alternative of developing the proposed Project as a single 232 MW plant. Generally, building one plant would have fewer environmental impacts. However, given the infrastructure requirements associated with building a single 232 MW plant, building two plants allows for economies of scale and reduces the infrastructure impacts, including transmission access and water development. In addition, a single 250 MW plant would not be as effective in meeting the Project objective of supporting attainment of renewable energy mandates and objectives. For these reasons, the development of a smaller project was rejected.*

Furthermore, given the applicants decision to modify the proposed project from a wet-cooled powerplant to an air-cooled power plant, the analysis of the wet-cooled alternative was not sufficient as a reasonable alternative. (DEIS at 2-4).

Recommendation: BLM should identify and evaluate alternatives to the proposed project, including those that are of different size, different technology and different location. Alternatives should include robust analysis of the potential adverse impacts from the proposed projects. BLM should not preclude consideration and analysis of a private land alternative or any other alternative from analysis because it is not within the agency's jurisdiction. In fact, NEPA regulations require inclusion of reasonable alternatives not within the jurisdiction of the lead agency. 40 C.F.R. § 1502.14(c).

A response to this comment is provided on a separate page following this comment document.

Cumulative Impacts Analysis: Cumulative impact is defined as the impact on the environment which results from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future action regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. 40 C.F.R. § 1508.7.

II. Climate Change

Comment No. 27-03

We applaud BLM for forecasting the changes likely to occur in the Great Basin as a result of climate change in describing the affected environment.[1]

Recommendation: We recommend that BLM carry that analysis into its discussion of the environmental consequences, cumulative effects and mitigation measures, including those associated with climate change.[2]

III. Water Resources

Comment No. 27-04

Project Water Source and Consumption: We are pleased to see that the project developer has decided to use an air-cooled power plant instead of a wet-cooled power plant. The project will now use almost 90 percent less water than originally proposed, decreasing water use from 4,600 acre-feet per year (afy) to 400 afy.

All water used in support of the project will be provided by either new or existing wells that pump naturally occurring groundwater from the Amargosa Hydrographic Basin ("basin"). Approximately 65 percent of this basin is located within Nevada and 35 percent within California. All of the wells used for this project will be located on land within Nevada. The portion of the basin within California is located primarily within Death Valley National Park.

The Amargosa basin lies within the Death Valley Regional Flow system. Groundwater in this system flows from recharge areas in the mountains of central and southern Nevada to discharge areas of playas and springs that are in Ash Meadows – one of the largest discharge areas – and Oasis Valley, Nevada, and Death Valley, California. The Ash Meadows/Death Valley regional

Responses to these comments are provided on a separate page following this comment document.

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[1] BLM's assessment that "uncertainty exists as to whether observed climate changes reflect natural variations or may be caused by increasing emissions of greenhouse gases," (DEIS at 3-13), does not reflect our state of knowledge of climate change. The latest scientific assessment from the U.S. Global Change Research Program, the body responsible for integrating and coordinating federal research on climate change, "global warming observed over the past 50 years is due primarily to human-induced emissions of heat-trapping gases." *Global Climate Change Impacts in the United States* 9 (Thomas R. Karl, Jerry M. Melillo & Thomas C. Peterson eds., 2009). Environmental analysis of this project should incorporate U.S. scientific knowledge.

[2] *See* Secretarial Order 3226, *Evaluating Climate Change Impacts in Management Planning* § 4 (January 16, 2009) ("Each bureau and office of DOI shall, in a manner consistent and compatible with their respective missions: Consider and analyze potential climate change impacts when undertaking long-range planning exercises, setting priorities for scientific research and investigations, and/or when making major decisions affecting DOI resources"); Council on Environmental Quality, *Considering Cumulative Effects under the National Environmental Policy Act* 24, 42 (1997) (including documentation and analysis of global warming in the affected environment and effects), *available at* http://ceq.eh.doe.gov/nepa/ccenepa/ccenepa.htm (last visited Apr. 20, 2010).

Comment No. 27-04 (continued)

groundwater flow system supplies water to many springs, streams, seeps and wetlands that are home to threatened and endangered species, and found within or near national wildlife refuges and national parks. Because the Amargosa basin is over-allocated, the Nevada state engineer has taken steps to prevent additional or changed groundwater pumping to protect basin resources, including the endangered Devils Hole pupfish.

Devils Hole, a small water-filled limestone cavern, is the only natural habitat for the Devils Hole pupfish. The water depth of Devils Hole is several hundred feet deep. However, most of the pupfish persist on a small shallow shelf which provides critical feeding and spawning habitat; spawning and feeding depends on water levels above this limestone shelf. These water levels are extremely sensitive to groundwater pumping up-gradient in the flow system. In absence of the proposed project, the elevation of groundwater in Devil's Hole has continued to decline at a steady rate over the last twenty years based on systematic monitoring conducted by the National Park Service. Although located within Ash Meadows National Wildlife Refuge, the area is administered by the National Park Service as part of Death Valley National Park.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 27-05

Baseline Information for Groundwater Resources: According to the DEIS, the applicant plans to purchase or lease existing water rights.[3]. Defenders appreciate the level of detail provided by the applicant regarding the proposed sources of water for the project. It appears, though, that BLM accidentally switched the annual duty for certificates 5715 and 12460.[4] The NDWR 2009a reference is a water rights permitting manual, not a reference containing information about the subject certificates.

Comment No. 27-06

Groundwater Impact Analysis: The DEIS analysis of impacts to the regional groundwater from the proposed project rely on the Death Valley Regional Flow System model (DVRFSM). The DVRFSM is used by the National Park Service, U.S. Fish and Wildlife Service ("FWS") and U.S Geological Survey in conducting analyses of the groundwater resources comprising the Death Valley regional flow system which includes the Amargosa basin. According to the DEIS, this regional flow model is numerically driven and is the only accepted groundwater flow model available for this flow system. Unfortunately, this flow model has limitations on its usefulness in predicting effects of groundwater pumping on surface springs and features at relatively large distances from the point of water use (i.e. the proposed project).

Comment No. 27-07

We are pleased the DEIS includes an analysis of the effects of current groundwater pumping on Devils Hole, which reveals that current pumping in the basin would result in a 13 foot decline in the elevation of the water surface in approximately 200 years. This emphasizes the severity of groundwater depletion in the Amargosa Desert basin. Unfortunately, the DEIS fails to adequately consider the impacts to groundwater that will result from the proposed project.

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[3] Applications 15702 (Certificate 6444), 15893 (Certificate 5717) and 43873 (Certificate 12460). Table 2-4 provides an annual duty and 6-year pumping average for each right

[4] *See* Certificate 12460, *available at* http://images.water.nv.gov/images/Certificates/12000/12460c.pdf (annual duty of 545.38 af); Certificate 5717, *available at* http://water.nv.gov/Water%20Rights/permitdb/page1.cfm?app=15893 (annual duty of 603 af); *cf.* Table 4-14. BLM should also clarify the years used to obtain the 6-year pumping average in Table 2-4.

Comment No. 27-08

Recommendation: Considering the sensitivity of groundwater use in the basin, and the demonstrated long-term adverse impact to water-dependent resources within the region (e.g., Devil's Hole, Ash Meadows, and springs within Death Valley National Park), we highly recommend the BLM analyze alternatives to the proposed project that would not require the use of groundwater from the Amargosa Desert basin. This approach could include alternative technology such as photovoltaic panels, or locating the project in an area where wastewater from existing facilities would be available.

Comment No. 27-09

Recommendation: The DEIS must further analyze the impacts to groundwater and groundwater-dependent resources due to project construction. Given that the construction over a 39 month period is projected to require 1,950 acre-feet of groundwater, or 600 acre-feet annually, a thorough analysis of the proposed projects effect on the already depleted groundwater from the Amargosa Desert Hydrographic Basin is needed. Construction water loss from the basin should be added to the operational water use rate for the operational time frame of the project so as to give a cumulative impact analysis for all phases of the project.

Comment No. 27-10

Recommendation: Considering limitations in using the DVRFSM and the acknowledgment that it is useful for modeling regional groundwater changes that are of much coarser scale than those addressed for the proposed project, we believe it would it be more appropriate to simply state that the potential impact to groundwater at Devil's Hole cannot be determined with certainty.

Comment No. 27-11

Recommendation: We recommend that the impact analysis include potential effects to water resources within Death Valley National Park, both within the Amargosa River channel and the groundwater discharging into Death Valley as underflow through the Funeral Range. The analysis should address the effects of current and reasonably foreseeable future land uses that would require use of groundwater from the Amargosa basin.

Comment No. 27-12

Existing Groundwater Use: Analysis of the potential effects of groundwater pumping from three wells to be utilized in support of the proposed project is based, in part, on what is described as "reported" recent use of 1,328 afy. The time period from 2005 to 2007 was given as an example of the recent time period. We consider this timeframe inappropriate, as explained below.

Recommendation: Because of the significant impacts groundwater pumping has on the Amargosa basin, we highly recommend that BLM perform its groundwater modeling and analyses with greater accuracy and precision. Analysis of the No Action alternative chose 2003 pumping and return flow to determine changes in water levels due to pumping – an utterly non-representative year – for a baseline analysis. In 2003, total groundwater pumping was 13,588 af, far less than the 17,967 af pumped in 2008, the most recent year for which records are available. Note that 2008 was not an aberration, groundwater pumping in the Amargosa basin has been increasing since 2003. Moreover, in 2003 the three wells pumped only 301.50 af, far below the 2005-2007 average, full duty use of 1,328 af. This modeling assumption understates the effect of current groundwater pumping and the environmental baseline. BLM should utilize a recent, representative year for its baseline analysis, or an average of years, such as the 2005-2007 time period. We also recommend BLM consult with the National Park Service in establishing an appropriate baseline year for the analysis.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 27-13

Cumulative Impacts Analysis: The use of water in the Amargosa Valley for the proposed project and for other solar energy projects proposed for this basin alone will deplete the waters of the Ash Meadows/Death Valley regional groundwater flow system, which supplies water to many springs, streams, seeps and wetlands that are home to threatened and endangered species and found within or near national wildlife refuges and national parks.

Comment No. 27-14

Recommendation: BLM should take a hard look at the water availability in the Amargosa Valley, contrasted with the water requirements of solar energy projects, and the cumulative effects in the Death Valley regional flow system. The Nevada State Engineer has ruled that the Amargosa Desert hydrographic basin is over-appropriated by 18,000 afy and applications for new water rights will be denied because they too are in excess of the perennial yield and against the public interest.[5] As a result, the total annual water demand (50,000 afy) estimated for solar energy development projects in the Amargosa Valley cannot be sustained by the water that is theoretically, but unlikely, available for purchase or lease in the basin (approximately 7,000 afy).[6] Even existing water rights may not be available, because the State Engineer will deny, with few exceptions, any application to change the point of diversion of an existing ground-water right to a point of diversion closer to Devils Hole.

Comment No. 27-15

Recommendation: BLM must analyze the water level at Devils Hole. In particular, if the water level in Devils Hole reaches the minimum court-ordered level in 2020, as stated in the DEIS, the BLM must assess whether the project is still viable. The impact analysis for the proposed action and all the alternatives should be included.

Comment No. 27-16

Water Treatment and Disposal: Most of the water supply will be treated by reverse osmosis or electrodialysis reversal for total dissolved solids reduction. These processes produce a waste stream of high concentrate of salts and other impurities.

Recommendation: BLM should take a hard look at the environmental effects of creating and disposing of this waste stream. The DEIS simply states that concentrate will be used for dust suppression (DEIS at 4-22) without analyzing the TDS level of the waste stream or the effect of applying high TDS water to the ground, to any vegetation and to any underlying aquifer. The DEIS also does not state whether all of the waste stream would be used or needed for this purpose, especially since BLM does not identify dust suppression as a need during operation (DEIS sec. 2.3.6.4) – when the waste stream would be produced – but during construction (DEIS sec. 2.3.6.5) – when no waste stream would be available.

Comment No. 27-17

IV. Biological Resources

Endangered species and critical habitat: The BLM has a duty under the Endangered Species Act ("ESA") to consult with the U.S. Fish and Wildlife Service to ensure that the impacts from solar development will not "jeopardize the continued existence of threatened and endangered species . . . or . . . destroy or adversely modify their designated critical habitat." 16 U.S.C. § 1536(a)(2).

Responses to these comments are provided on a separate page following this comment document.

[5] *See* State Engineer's Ruling No. 5750 (July 16, 2007), *available at* http://images.water.ny.gov/images/rulings/5750r.pdf.
[6] *Id.* at 19.

Comment No. 27-17 (continued)

The ESA "is the most comprehensive legislation for the preservation of endangered species ever enacted by any nation." *Tennessee Valley Authority v. Hill*, 437 U.S. 153, 180 (1978). The Supreme Court's review of the ESA's "language, history, and structure" convinced the Court "beyond a doubt" that "Congress intended endangered species to be afforded the highest of priorities." *Id.* at 174.

Under section 7(a)(2) of the ESA, every federal agency "shall…insure that any action authorized, funded, or carried out by such agency ("action agency") is not likely to jeopardize the continued existence of the endangered or threatened species or result in the destruction or adverse modification of habitat of such species…determined…to be critical…." 16 U.S.C. § 1536(a)(2) (Section 7 consultation). Agency "action" is defined in the ESA's implementing regulations to include "all activities or *programs* of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas.

Of great concern are project impacts on the water dependent biological resources, including the Devils Hole pupfish. According to the DEIS, the water level in Devils Hole is declining due to current ground water pumping, and by 2020 the water level is expected to reach the court mandated minimum water level deemed necessary to sustain the Devils Hole pupfish. That water level is currently approximately 0.7 feet above minimum legal mandate.

The use of measurable conservation targets and thresholds (*e.g.* self-sustaining populations, minimize the likelihood of listings) adds structure to decision-making processes, and is very much in line with BLM's desire to practice science-based management in solar development policy, as expressed by Department of the Interior leadership, including Assistant Secretary for Land and Minerals Management Wilma Lewis.[7] The use of baseline biological information concerning target fish and wildlife population condition, along with the forecasting and monitoring of population trends/habitat conditions over time following development decisions, provides a science-based means of evaluating solar development policy within an adaptive management framework.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 27-18

Scope of the impact analysis: The DEIS impact analysis for biological resources is focused largely on plants and animals occurring on the proposed project site, and those at-risk species associated with Ash Meadows and Devil's Hole. Ash Meadows supports approximately 25 endemic species, many of which are listed under the federal Endangered Species Act (ESA) as threatened or endangered. At least five Federal threatened and endangered species in the Ash Meadows area are dependent on wetland and aquatic habitats derived from groundwater.[8] Due to potential adverse impacts on protected species and designated critical habitat, the BLM must consult with the FWS pursuant to Section 7 of the ESA.

The analysis of the effects of the proposed project on water dependent biological resources is limited to those associated within the Ash Meadows region. The regional groundwater flow

[7] Wilma Lewis, Assistant Secretary for Land and Minerals Management, Keynote Address at the 2009 BLM Renewable Energy Summit (Aug. 31, 2009).

[8] Devils Hole Pupfish (*Cyprinodon diabolis*) (Endangered), Ash Meadows Amargosa Pupfish (*Cyprinodon nevadensis mionectes*) (Endangered), Warm Springs Pupfish (*Cyprinodon nevadensis pectoralis*) (Endangered), Ash Meadows Speckled Dace (*Rhinichthys osculus nevadensis*) (Endangered), Ash Meadows naucorid (*Ambrysus amargosus*) (Threatened)

Comment No. 27-18 (continued)

system includes Death Valley and the Amargosa River in addition to Ash Meadows, and the surface manifestations resulting from groundwater discharge.

Recommendation: The analysis of the effects of the current situation and all of the reasonable alternatives on these resources needs to be part of the analysis of effects. Analysis of the no action alternative may be particularly important because information contained in the DEIS indicates that current levels of groundwater pumping in the Amargosa basin are unsustainable and will likely have to be legally curtailed to comply with existing federal and state laws.

Comment No. 27-19

Recommendation: BLM must analyze the water level at Devils Hole. In particular, if the water level in Devils Hole reaches the minimum court-ordered level in 2020, as stated in the DEIS, the BLM must assess whether the project is still viable. The impact analysis for the proposed action and all the alternatives should be included.

Comment No. 27-20

Recommendation: The management framework for public lands that will guide the analysis of the effects of the proposed project and alternatives should include the policy provisions of BLM Manuals 6500 and 6840. They contain policy guidance for BLM management of wildlife habitat on public lands. Manual 6500 directs BLM "…to manage habitat on an ecosystem basis for the purpose of ensuring self-sustaining populations and a natural abundance and diversity of wildlife, fish, and plant resources on the public lands." Ensuring self-sustaining fish and wildlife populations provides a measurable, affirmative conservation objective to the BLM that should be used to help structure renewable energy development decisions as well as associated mitigation strategies. Manual 6840 policy requires BLM to manage public lands to meet two objectives: 1) To conserve and/or recover ESA-listed species and the ecosystems on which they depend so that ESA protections are no longer needed for these species; 2) To initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing these species under the ESA.

Clearly, these two manuals provide critical direction to BLM in considering and analyzing environmental impacts of the proposed project and strengthen the importance of considering and analyzing alternatives that would allow BLM to meet its policy objectives with regard to wildlife resources, including those at risk in the Ash Meadows region.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 27-21

Mitigation measures: NEPA requires agencies to include a discussion of the means to mitigate adverse environmental impacts of projects. 40 C.F.R. § 1502.16(h). The DEIS indicates that because the impact assessments for ESA protected species occurring in Ash Meadows have not been completed, mitigation measures will be developed for certain affected species after ESA consultation is completed. NEPA requires agencies to include a discussion of the means to mitigate adverse environmental impacts of projects. 40 C.F.R. § 1502.16(h). We are concerned that BLM appears to consider the applicant's approval of any impact mitigation measures a necessary aspect of the NEPA process. While the applicant has a role in assisting BLM in identification of impact mitigation measures, it is for the action agency to determine the most effective mitigation measures.

Recommendation: Impact analysis for the projected loss of approximately 7 afy of groundwater discharge at Ash Meadows needs to be part of the final environmental impact statement for the

Comment No. 27-21 (continued)

proposed project. This impact analysis should be based, in large part, on the outcome of the ESA Section 7 consultation.

Comment No. 27-22

Recommendation: Since the impact analysis for all groundwater-dependent species potentially affected by the proposed project has not been completed, we strongly recommend that BLM prepare a supplement to the DEIS that fully addresses this current shortcoming. The NEPA analysis for public review cannot be considered adequate until the effects of the project on federally protected species and designated critical habitat are analyzed and revealed. This is especially important because formulation of effective impact mitigation measures is dependent on a comprehensive and detailed impact analysis.

Comment No. 27-23

Recommendation: Please analyze impacts to Amargosa basin groundwater and groundwater-dependent biological resources associated with the Amargosa River and springs and seeps within Death Valley National Park. The impact assessment should include both the proposed action and no action alternatives.

Comment No. 27-24

Recommendation: Please clarify that the project applicant does not have authority to control the outcome of the NEPA compliance process agreeing or disagreeing to mitigation measures the agencies deem necessary.

Responses to these comments are provided on a separate page following this comment document.

V. Visual Resources

Comment No. 27-25

Nighttime lighting: We are pleased that the DEIS recognizes the value of visual values associated with the natural landscape and includes sections addressing effects of nighttime lighting. Unfortunately, the DEIS broadly states that "[p]roject lighting would be designed to provide the minimum illumination needed to achieve safety and security objectives" and that "[l]ighting would be shielded and oriented to focus illumination on the desired areas (predominately the power block), thus minimizing additional nighttime illumination in the site vicinity." (DEIS, Page 4-65) These statements provide no assurance that the illumination would not result in significant degradation of night sky conditions.

Recommendation: Dark sky conditions within the region, and especially within Death Valley National Park, should be more accurately described using a systematic approach that provides an objective analysis of the current conditions and their values. Natural dark sky conditions within Death Valley National Park are extremely important and characteristic of many areas within the park. Over time this resource has been degraded by commercial and residential development in Las Vegas and by addition of the prison facility north of Las Vegas on the west side of Highway 95. We question the significance of automobile traffic on Highway 95 as a source of nighttime lighting and effects on dark sky conditions.

Comment No. 27-26

Recommendation: Modeling of the illumination effects of the proposed facility for safety and security needs to be performed and the change in nighttime conditions analyzed and disclosed in the final environmental impact statement. The modeling and analysis needs to include night sky viewing locations within Death Valley National Park. The National Park Service should be asked to take a lead role in this effort. The analysis should include actual night sky photographs plus simulations of the effects of the lighting at the proposed project from viewing points within

Comment No. 27-26 (continued)

the park. The sheer size of the proposed project, nearly six square-miles, and one in which safety and security lighting is needed, poses a potentially significant impact to visual resources and especially those associated with Death Valley National Park.

Comment No. 27-27

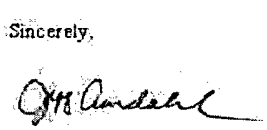
Impact mitigation: The DEIS recommended mitigation for the impacts to night sky conditions is to simply require the project proponent to "... consider location and type of lighting to minimize potential light pollution to the greatest extent practicable." The suggested measures included requirements to use or consider light hoods/shields, directional lighting, minimum amount of illumination required to provide the necessary safety and security, perimeter setback and use on an as-needed basis. There is no assurance that these measures would not prevent unacceptable levels of dark sky resources impacts from sensitive viewing locations, such as areas within Death Valley National Park.

Recommendation: Mitigation of impacts to dark sky conditions cannot be developed in the absence of an objective analysis of existing conditions and those that would occur as a result of night lighting for the proposed project. An analysis from key observation areas within Death Valley National Park is essential. The management threshold for dark sky conditions within the Park should be established by the National Park Service and fully accepted by BLM.

Responses to these comments are provided on a separate page following this comment document.

Thank you for considering our comments. If you have any questions, please contact me at (916) 313-5800 x110 or via email at jaardahl@defenders.org.

Sincerely,



Jeff Aardahl
California Representative

Cc: Superintendent, Death Valley National Park

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RESPONSES TO COMMENT NO. 27-01 THROUGH 27-27

Response to Comment No. 27-01

The BLM believes that the EIS is consistent with NEPA requirements and that the level of information and analysis reasonably represents baseline conditions in the ROI.

Response to Comment No. 27-02

This EIS evaluates the potential environmental effects associated with Solar Millennium's request for a right-of-way to construct, operate and decommission a solar thermal general facility on federal lands they identified in their right-of-way application (Case No. NVN-084359). BLM's decision based on this EIS will be whether to grant, deny, or grant with modifications that application. Alternatives considered, but not evaluated in detail did not meet the project purpose and need.

The EIS considers a reasonable range of alternatives, including three fully-studied alternatives and many that were evaluated but dismissed from further study because they did not meet the purpose and need for the Proposed Action, including offsite and smaller alternatives.

Regarding why a wet-cooled alternative remains a viable alternative, see the responses to comments 20-10 and 25-03.

The purposes of an alternatives analysis are to present sufficient choices for reasoned decision making, and to use alternatives to reveal differences in effects. The FEIS effectively serves these purposes.

Response to Comment No. 27-03

At this time there is no solid method for determining if the project will have future environmental consequences based on an assumption that the project has an effect on climate change. With the amount of information available today about climate science, and future projects, it is not possible to determine the overall climate change contribution the cumulative effects will have. Currently, climate change is not something that is regulated; therefore there are no approved mitigation measures for climate change. Some greenhouse gases are regulated, for this project NDEP-BAPC will be the agency involved with the air quality of the project.

Response to Comment No. 27-04

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 27-05

Commenter is correct; the annual duty for certificates 5715 and 12460 were switched. Table has been updated in the FEIS. Also, the correct reference has been added to the FEIS.

Response to Comment No. 27-06

Comment noted. The limitations of the DVRSM for use in this analysis are described in the EIS. Model results are treated cautiously and used in conjunction with other data to evaluate potential impacts to groundwater resources.

Response to Comment No. 27-07

Impacts to groundwater from the construction and operation of the proposed project are described in section 4.4.

Response to Comment No. 27-08

Solar Millennium is proposing to build a concentrating solar power project with thermal energy storage. This is the technology they selected for use at this particular location. The BLM's purpose and need is to respond to Solar Millennium's application under Title V of the Federal Land Policy Management Act for a right-of-way grant to construct, operate, and decommission said facility. The BLM's action for this EIS is to grant, grant with modifications, or deny Solar Millennium's application for a right of way on lands managed by the BLM.

Response to Comment No. 27-09

Impacts to groundwater from the construction and operation of the proposed project are described in section 4.4.

Response to Comment No. 27-10

Comment noted. Model results are treated cautiously and used in conjunction with other data to evaluate potential impacts to groundwater resources. The limitation of the model is fully described in the EIS.

Response to Comment No. 27-11

The commenter is referred to Section 4.17.7.4.

Response to Comment No. 27-12

The DVRFS model is the only existing groundwater flow model of the study area. The model only has data through 2003.

Response to Comment No. 27-13

Comment noted. The Nevada State Engineer will determine what measures would be taken should a basin become overextended due to additional growth, drought conditions, or uses by existing or pending water right holders in the basin. The State Engineer has the authority to modify existing or proposed water uses in accordance with any such determination.

Response to Comment No. 27-14

The usefulness in the DVRFS model is showing that cumulative effects of pumping at current levels will cause an impact to Devils Hole and Ash Meadows. The magnitude may be uncertain, but is still an important finding that should be noted.

Response to Comment No. 27-15

The water level in Devils Hole is monitored daily by the National Park Service and occasionally by the U.S. Geological Survey.

Response to Comment No. 27-16

There is no vegetation in the area that will be affected as the Project area will be graded. The water table is too deep for pollutants to infiltrate the aquifer.

Response to Comment No. 27-17

See response to Comment 22-13.

Response to Comment No. 27-18

As stated in Section 3.4, the Region of Influence (ROI) for surface water is different from the groundwater ROI. The ROI for surface water included the Amargosa Desert Hydrographic Basin (see section 3.4.3). The ROI for groundwater included the Death Valley Regional Flow system (see section 3.4.4).

Response to Comment No. 27-19

The effects of the construction and operation of the proposed project on water levels at Devils Hole are described section 4.4. The Nevada State Engineer will determine what measures would be taken should a basin become overextended due to additional growth, drought conditions, or uses by existing or pending water right holders in the basin. The State Engineer has the authority to modify existing or proposed water uses in accordance with any such determination.

Response to Comment No. 27-20

The EIS is consistent with the requirements of NEPA and FLPMA, and with the BLM policies that implement those statutes. The FEIS fully evaluates and discloses impacts to biological resources, and consultation with USFWS under the Endangered Species Act (ESA) further adds to this analysis and provided for meaningful conservation of protected species in the case of any ESA-covered adverse impacts.

Response to Comment No. 27-21

See response to Comment 22-13.

Response to Comment No. 27-22

The BLM is currently in Section 7 Consultation with the USFWS. A Biological Assessment has been submitted and will be made publicly available with a Biological Opinion once the inter-agency consultation is complete.

Response to Comment No. 27-23

The proposed Project would not impact groundwater-dependent biological resources associated with the Amargosa River and springs and seeps within the Death Valley National Park.

Response to Comment No. 27-24

The BLM is the lead federal agency in the preparation of this EIS, and has the final authority to issue a right-of-way grant subject to certain terms and conditions. BLM has prepared the DEIS and the FEIS at its own direction; Solar Millennium has had no control over that environmental review process or over BLM's decision making process.

Response to Comment No. 27-25

The Proponent has committed to specific mitigation measures that will be incorporated in the FEIS that will mitigate impacts to night sky to the greatest extent feasible (i.e., mitigation of night lighting).

Visual impacts were based on preliminary engineering and design, which did not consist of a lighting plan. Therefore, effects to night sky associated with Death Valley National Park could not be assessed. As stated above, more specific night light mitigation measures will be incorporated into the FEIS.

Traffic from US 95 contributes to the affected environment regarding night sky. Although US 95 is among the most traveled routes in Nye County, no time-of-day studies were available from NVDOT.

Response to Comment No. 27-26

A lighting plan with specific lighting mitigation measures will be developed by the Proponent in consultation with the BLM. Specific mitigation measures will be incorporated in the final Plan of Development (POD) that will mitigate impacts to the night sky to the greatest extent feasible.

Response to Comment No. 27-27

Dark sky mitigation measures listed in the EIS are listed in general terms as a detailed lighting plan has not been developed at the time of the EIS. Following final engineering design, the Proponent will be required to submit a Lighting Plan that BLM will revise and approve. However, the FEIS discloses the Project's visual effects based on the Project's near-final design specifications.

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JIM GIBBONS
Governor

STATE OF NEVADA
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May 3, 2010

NDOW-SR#: 10-273
SAI #: E2010-164

Mr. Greg Helseth, Renewable Energy Project Manager
Bureau of Land Management
Pahrump Field Office
4701 Torrey Pines Drive
Las Vegas, NV 89130-2301

Re: Draft EIS for the Amargosa Farm Road Solar energy Project, DES 10-10; March 2010 (DEIS)

Dear Mr. Helseth:

Thank you for sharing the DEIS with the Nevada Department of Wildlife (Department). Sections addressing wildlife, a subset of the biological resources impact analyses, were overall adequately prepared and in some instances well-done and comprehensive. While most proposed mitigation seemed appropriate for direct and indirect impacts regarding wildlife/habitat resources, certain aspects of the DEIS remained problematic. Two concerns we believe significant were identified.

Comment No. 28-01

The first has to do with drawing from a water supply that if exceeded and hydrological dynamics become adverse for sustaining present use demands and continuing preservation and conservation of aquatic resources at Ash Meadows, irreparable compromise of those aquatic resources could occur. We understand hydrology is not the Department's forte', and the 400 ac-ft/year for the Proposed Action Alternative is to be obtained by the proponent's purchasing or leasing of existing water allocations. However, the uncertainties indicated with a largely non-metered water supply and modeling assumptions made in the DEIS cannot be supported without contingency(ies) should the hydrological system show unanticipated vulnerability while the solar energy facility is in operation. It would seem the BLM assumes an accountable position should it not have contingency measures clearly lined out as to how unanticipated impacts to irreplaceable aquatic resources would be mitigated. The Department requests additional discussion on this point.

Comment No. 28-02

The second concern is that no measures proposed to trigger action for obtaining a better informed perspective of wildlife, habitat and other biological resources on a landscape level. This is especially apparent when considering the cumulative impacts associated with this project and others proposed and pending in southern Nevada. Other pre-existing multiple uses would become more restricted by available space reductions on which to occur, the same space on which biological resources depend. What is the threshold at which management decisions can be made before irreplaceable or irreparable harm to biological resources or ecosystem function occurs? In view of the large project area required, direct

Responses to these comments are provided on a separate page following this comment document.

Comment No. 28-02 (continued)

impacts and certainly cumulative effects to wildlife and habitat will culminate over the life of the Proposed Action. Identifying a mechanism for invoking off-site compensation now as a worse case mitigation scenario would seem appropriate. Passing the responsibility on to other future projects as they occur or to planning processes (e.g. Programmatic EIS for Solar Energy Development in the Western States; Las Vegas RMP Revision) would seem counter-productive when the Proposed Action could support through example efforts to address this issue as other projects and planning processes progress. Gaining an enhanced decision making foundation through the Proposed Action Alternative is a topic the Department requests additional discussion.

Observations and comment to more specific areas of the DEIS include but are not limited to:

Comment No. 28-03

Page ES-9, Section ES-1.4.2, last line of 2nd paragraph:
Conflicting prepositions in the sentence segment, "...identified for use *in under* the dry-cooled alternative..."

Comment No. 28-04

Page ES-10, Section ES-1.4.2, last word to last paragraph:
The judgmental severity of *penalty* implied is puzzling. Are there not other deficits or costs to other natural resources relative to dry versus wet-cooled technology?

Comment No. 28-05

Page ES-14, Section ES-1.4.4.2, entire last paragraph:
The paragraph seems to be unnecessary as it is redundant to statements made previously in section 1.4.2.

Comment No. 28-06

Page ES-16, Table ES-1-4, Wet-Cooled column, Water Resources – Sections 3.4 & 4.4:
What is the measure or basis of confidence in the assumption made; should the assumption be in error, what is the contingency?

Comment No. 28-07

Page ES-17, Table ES-1-4, Wet-Cooled column, 2nd paragraph under Vegetation Resources:
The paragraph would be more appropriately placed under the Wildlife Resources heading.

Comment No. 28-08

Page ES-18, Table ES-1-4,

- *Proposed Action* column, middle of 1st paragraph under Wildlife Resources:
  Regarding the statement, "*Pre-construction clearance surveys would be conducted to ensure that activities associated with the construction and operation of the Project would not cause mortality to individuals.*" Clarity of the scope of this mitigation action is requested as it may be somewhat misleading as to its realistic coverage of all wildlife species potentially disturbed.

Comment No. 28-09

- *Wet-Cooled* column, Wildlife Resources:
  Efforts for specifically addressing possible consequences to the Ash Springs system would seem appropriate here.

Comment No. 28-10

Page 1-12, Table 1-2, State Laws and Statutes:
None as administered by the Nevada Department of wildlife are included here. Unless mistaken, Nevada Revised Statutes 503.584 through 503.589 are an indication of the framework and process for certain wildlife. At least NRS 502.390, NRS 503.430, NRS 503.597, NRS 503.610, NRS 503.620, as well as Nevada Administrative Codes 503.0015 through 503.104 in all or part would seem to have relevance.

Comment No. 28-11

Page 1-15, Table 1-3:
Authorization for moving or handling wildlife from one location to another, even out of harm's way is required. NRS 503.597 and related regulations like NAC 503.093 are germane.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 28-12

Page 2-46, 1st paragraphs under *Wildlife Resources* in *Proposed Action* and *Wet-Cooled Alternative* columns:
Regarding the statement, *"Pre-construction clearance surveys would be conducted to ensure that activities associated with the construction and operation of the Project would not cause mortality to individuals."* Clarity of the scope of this mitigation action is necessary as it may be somewhat misleading as to its realistic coverage of all wildlife species potentially disturbed.

Comment No. 28-13

Pages 3-80 (middle paragraph) & 3-81 (Table3-16).
Relative to bighorn sheep on the Project Area, the last two sentences to the paragraph state that a bighorn skull was found in Forty Mile Wash and imply it was on the Project Area; whereas in Table 3-16, "Sheep sp." is identified. Domestic sheep were not found in DEIS narratives so clarity is requested.

Comment No. 28-14

Page 3-96, Section 3.6.5.3, Reptiles paragraph, last sentence:
The Project Area provides habitat (as opposed to *potentially suitable*) for the shovel-nosed snake as it was observed there; see Table 3-14 on Page 3-79.

Comment No. 28-15

Page 4-40, 1st three lines of top paragraph: Please read NDOW's personal communication carefully.

Comment No. 28-16

Page 4-43, Section 4.6.2.2, 2nd paragraph:

- Additional to birds, bats may also be vulnerable to hyper-saline solutions.
- The end of the last sentence might need a punctuation mark.

Comment No. 28-17

Page 4-101, Section 4.14:
Reverse order of the last two paragraphs would benefit the DEIS.

Comment No. 28-18

Page 4-102, 2nd line of 2nd paragraph from top:
Should the presumption of permanent loss of habitat be correct, what measures for habitat enhancement, maintenance and rehabilitation will be implemented elsewhere where desert tortoise and other wildlife habitat become more important conservation bastions?

Comment No. 28-19

Page 4-190, Section 4.17.6:
The last paragraph could become the opening lines of the 2nd paragraph.

Comment No. 28-20

Page 4-115, Section 4.17.7.7, last paragraph:
The last two sentences provide a flat ending to the consequences described for wildlife resources. Treating present and future projects does have benefit by ensuring mitigation and other actions are tailored to each regarding direct and many indirect effects; however discussion of the eventual culmination of overall landscape effects is avoided. Discussion of the potential for compensatory measures here would seem in order inclusive of context for other land use projects and planning processes, especially concerning the threshold of landscape-scale adverse impacts.

Comment No. 28-21

Page A-5, Measure WL-5:
Relative to the transmission right-of-way mentioned, overlap of the Proposed Action with tie-in to other transmission projects (e.g. Valley Electric) is unclear. Mindful of this, structural design of transmission towers is relevant. Additional to APLIC guidelines as stated in the DEIS, altogether avoidance of installing lattice-style towers is requested. Tubular monopole, Tubular-H or a new Tubular-V design is

Responses to these comments are provided on a separate page following this comment document.

recommended. Relative to the cross beams of the latter two designs, an inverted Y member is also recommended to deter perching by birds. The Department will be happy to further discuss these designs.

Thank you again for this opportunity for providing input. As a cooperating agency, the Department looks forward to additional discussions relative wildlife resources. Should immediate questions or concerns arise please contact me at the Department's Southern Region office or by email at bhrdnbrk@ndow.org.

Sincerely,

D. Bradford Hardenbrook
Supervisory Biologist - Habitat

Southern Region
Nevada Department Wildlife
4747 Vegas Drive
Las Vegas, NV 89108
702/486-5127 x3600
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DBH:dbh

cc: NDOW, Files

RESPONSES TO COMMENT NO. 28-01 THROUGH 28-21

Response to Comment No. 28-01

See responses to Comment No.'s 05-01 and 24-02.

Response to Comment No. 28-02

BLM appreciates your comment.

Response to Comment No. 28-03

Grammatical error corrected in FEIS.

Response to Comment No. 28-04

The information is provided to disclose the differences in efficiency between wet- and dry- cooled process.

Response to Comment No. 28-05

Agreed; paragraph is redundant. Paragraph deleted in Final EIS.

Response to Comment No. 28-06

Water required for construction and operation of the proposed solar facility were developed by Solar Millennium's engineers based on their understanding of facility requirements.

Response to Comment No. 28-07

In response to comment, Table ES-1-4 has been updated in the Final EIS.

Response to Comment No. 28-08

In response to comment, Table ES-1-4 has been updated in the Final EIS.

Response to Comment No. 28-09

As stated in the Table ES-1-4, there would be no new groundwater pumping under the wet-cooled alternative; therefore, it is assumed that the impacts to biological resources would be similar to the dry-cooled alternative.

Response to Comment No. 28-10

In response to comment, Table 1-2 has been updated in the Final EIS. The BLM does not believe that NRS 503.610 is applicable as there is no evidence that Bald or Golden Eagles are likely to occur on the site and be subject to take. Text has been added to Sections 3.6.5.3 and 4.6.2.1 elaborating on impacts to eagles. Additionally, the Proponent has committed to develop a site-specific Avian Protection Plan.

Response to Comment No. 28-11

In response to comment, Table 1-3 has been updated in the Final EIS.

Response to Comment No. 28-12

In response to comment, Table ES-1-4 has been updated in the Final EIS.

Response to Comment No. 28-13

In response to comment, Table 3-17 has been updated in the Final EIS.

Response to Comment No. 28-14

In response to comment, the text has been updated in the Final EIS.

Response to Comment No. 28-15

In response to comment, the text has been updated to more accurately reflect NDOW's personal communication in the Final EIS.

Response to Comment No. 28-16

In response to comment, the text has been updated in the Final EIS.

Response to Comment No. 28-17

Comment noted. Last two paragraphs reversed for readability.

Response to Comment No. 28-18

As stated in Section 4.6.2.4, compensatory mitigation is required to fully offset any impact to Desert Tortoise.

Response to Comment No. 28-19

Comment noted. Incorporated commenter's suggestion for readability.

Response to Comment No. 28-20

It is speculative to make assumptions of impacts of all projects with applications submitted to BLM. As stated in 4.17.4, the likelihood of implementation of these cumulative project is unknown. Each project will be required to comply with NEPA which will include a cumulative effects analysis.

Response to Comment No. 28-21

Transmission lines to be developed or upgraded by Valley Electric Association will be analyzed in a separate NEPA action. However, the BLM will require that all transmission line structure constructed as part of their proposed action meet APLIC guidelines.

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Nevada State Clearinghouse

From: John Walker
Sent: Tuesday, April 27, 2010 1:17 PM
To: Nevada State Clearinghouse
Subject: FW: Amargosa Valley Solar Project - Tech Review of EIS

FYI – Clearinghouse Comments

From: Cliff Lawson
Sent: Tuesday, April 27, 2010 12:03 PM
To: John Walker
Cc: Alan Tinney; Janine Hartley; Mark Kaminski; Michele Reid; Kristen Rose
Subject: FW: Amargosa Valley Solar Project - Tech Review of EIS

BWPC may require permits for some (or all) of the following. These activities would include any necessary review of engineering plans for the facility:

Comment No. 29-01

General Stormwater Permits

1. Site Grading Activities (> 1 acre) – General Construction Storm Water Permit NVR100000 for the Amargosa River Watershed - http://ndep.nv.gov/bwpc/storm_cont03.htm
2. Prior to beginning operations of the Facility a General Industrial Storm Water Permit NVR050000 for a Steam Generating Power Plant - http://ndep.nv.gov/bwpc/storm_ind03.htm

General Onsite Sewage Disposal System Permits

3. Sanitary Wastewater Disposal (180 Employees) - Large Capacity Septic System (LCSS) General Permit GNEVOSDS09 - http://ndep.nv.gov/bwpc/uic_lcssinfo.htm

NEV Groundwater Discharge Permit - http://ndep.nv.gov/bwpc/forms.htm

4. Four Evaporation Ponds (46 acres) - NEV Groundwater Discharge Permit - http://ndep.nv.gov/bwpc/nevapp03.doc
5. Non-Potable Water Reuse (Dust Abatement) on Unspecified Acreage - NEV Groundwater Discharge Permit - http://ndep.nv.gov/bwpc/nevapp03.doc
6. Bio-Remediation Cell (7.3 Acres) - NEV Groundwater Discharge Permit - http://ndep.nv.gov/bwpc/nevapp03.doc

Note:

Item 2 assumes a startup fossil fuel source (e.g. propane, methane) to heat the HTF in the morning until circulatory temperature is maintained since the solar troughs "cool" down each evening when the sun goes down.

Items 4-6 would require potentially two NEV Discharge Permits.

Response to Comment No. 29-01
Comment noted: Potential authorizations, permits, reviews, and approvals are listed in Table 1-3.

The first NEV permit would cover the four evaporation ponds and the reuse of non-potable water from them for dust abatement.

The second NEV permit would address the lined bio-remediation cell where spillage onto soils and composting thereof of the Heat Transfer Fluid (HTF) or diphenyl/biphenyl oxide is addressed.

The Permits Branch may decide that items 4-6 would best be covered under one discharge permit but this would combine two unrelated activities, i.e., ponds and soil farming.

Clifford M. Lawson, P.E.
Technical Services Supervisor
Bureau of Water Pollution Control
Nevada Division of Environmental Protection

Rebecca Palmer

From: Nevada State Clearinghouse
Sent: Thursday, March 25, 2010 8:59 AM
To: Rebecca Palmer
Subject: E2010-164 Amargosa Farm Road solar energy project, Nye County - Bureau of Land Management

NEVADA STATE CLEARINGHOUSE
Department of Administration, Budget and Planning Division
209 East Musser Street, Room 200, Carson City, Nevada 89701-4298
(775) 684-0213 Fax (775) 684-0260

TRANSMISSION DATE: 3/25/2010

State Historic Preservation Office

Nevada SAI # E2010-164

Project: Amargosa Farm Road solar energy project, Nye County

Follow the link below to download an Adobe PDF document concerning the above-mentioned project for your review and comment.
E2010-164

Please evaluate it with respect to its effect on your plans and programs; the importance of its contribution to state and/or local
areawide goals and objectives; and its accord with any applicable laws, orders or regulations with which you are familiar.

Please submit your comments no later than Wednesday, April 28, 2010.
EIS also available here.

Use the space below for short comments. If significant comments are provided, please use agency letterhead and include the Nevada SAI number and comment due date for our reference.

Clearinghouse project archive

Questions? Reese Tietje, (775) 684-0213 or clearinghouse@state.nv.us

Comment No. 30-01

___No comment on this project ✓ Proposal supported as written

AGENCY COMMENTS:

Rebecca L Palmer

3/29/10

Response to Comment No. 30-01
Comment noted. The BLM appreciates the commenter's participation in the EIS process.

John F. Bosta
P.O. Box 42
Amargosa Valley, NV 89020
(775) 372-9038

May 3, 2010

DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Southern Nevada District
Pahrump Field Office
4701 N. Torrey Pines
Las Vegas, NV 89130-2301

SUBJECT: Draft Environmental Impact Statement (EIS) for the Solar Millennium Amargosa Farm Road Solar Power Project, Nye County, NV

ATTN: Gregory Helseth, Project Manager

Comment No. 31-01

Thank you for the opportunity to make the second set of comments on the Draft Environmental Impact Statement (EIS) for the Solar Millennium Amargosa Farm Road Solar Power Project, Nye County, NV

Due to the outstanding unresolved and addition of issues that this project has instigated, I would like to request that the review and comment deadline be extended into the end of July 2010.

The EPG, Inc. has had more than six months to write the Draft EIS for BLM and the public has only 45 days to respond to the Draft EIS.

Response to Comment No. 31-01
The 45-day comment period is consistent with the Council on Environmental Quality regulations for implementing the National Environmental Policy Act regarding the review of draft environmental impact statements. Significant effort was made to advise people of the schedule and duration for the review well in advance.

Comment No. 31-02

Acronyms and Abbreviation, page xv

The Amargosa Valley, Nevada AREA PLAN (AVAP) and the Nye County Comprehensive Plan (NCCP) are not included in the list. Why?

Response to Comment No. 31-02
The Amargosa Valley Area Plan and Nye County Comprehensive Plan were spelled out in the main body of the text. Only acronyms and abbreviation used in the main body of the text are listed in this section.

Comment No. 31-03

3.9 Socioeconomic

The existing social and economic conditions within Region of Influence (ROI) "emphasis on the communities closest to the Project area, such as Amargosa ..." are factually incorrect.

1. This Project area is within the boundaries and sphere of influence of the Town of Amargosa Valley. In fact, all of the solar project applications located on the map, Cumulative Impacts Figure 4-10, page 4-106 is within the Town of Amargosa Valley except NVN 083220 and NVN08321.
2. All of the solar applications within the Town of Amargosa Valley comply with land use of the Amargosa Valley, Nevada AREA PLAN except this Project.

The House and Senate Energy and Natural Resources Committee passed a Renewable Energy Standard (RES) that would order utilities to generate 25% of their power from renewables by 2025.

Many Congressmen were angered by the Investigative Reporting Workshop at American University study that found 79% of the $2 billion in renewable energy grants given out from the stimulus went to foreign companies.

The economic bubble in Spain has burst. Look at these two articles:

1. The New York Times, by Elisabeth Rosentha March 09, 2010, After boom and bust, solar power finds a place in Spain

Comment No. 31-03 (continued)

Half the solar power installed globally in 2008 was installed in Spain. But as low-quality, poorly designed solar plants sprang up like weeds on Spain's plateaus, Spanish officials came to realize that they would have to subsidize many of them indefinitely, and that the industry they had created might never produce efficient green energy on its own.

In its haste to create a solar industry, Spain made some miscalculations: solar plants can be set up so quickly and easily that the rush into the industry was much faster than anticipated. And the lavish subsidies inflated Spanish solar installation costs at a time when they were rapidly decreasing elsewhere—in part because of increasing competition from panel makers in China, but also because higher volumes produced economies of scale.

In Spain, the tariff, adjusted quarterly, is about 39 cents per kilowatt-hour for electricity from freestanding solar power plants, and slightly higher for panels on rooftops

Germany's tariff, 53 cents per kilowatt-hour, is expected to come down at least 15 percent this summer, and there are proposals before Parliament to eliminate subsidies for solar plants on farmland

In September, the government abruptly changed course, cutting payments and capping solar construction. Puertollano's brief boom went bust. Factories and stores shut, thousands of workers lost their jobs, foreign companies and banks abandoned contracts that had already been negotiated.

Puertollano's wrenching fall points to the delicate policy calculations needed to stimulate nascent solar industries and create green jobs, and might serve as a cautionary tale for the United States, where a similar exercise is under way.

2. Nevada Agriculture & Livestock Vol. 61 No. July 2000,

Can Nevada afford to be the center of Green America

First is that the Spanish experience is considered a leading example to be followed by many policy advocates and politicians. This study marks the very first time a critical analysis of the actual performance and impact has been made.

Most important, it demonstrates that the Spanish, EU-style 'green jobs' agenda now being promoted in the U.S. in fact destroys jobs, detailing this in terms of jobs destroyed per job created.

The central finding of the study is that --treating the data optimistically--for every renewable-energy job that the government finances, "Spain's experience reveals with high confidence, by two different methods, that the U.S. should expect a loss of at least 2.2 jobs on average, or about 9 jobs lost for every 4 created."

To create about 50,000 green jobs, Spain lost 110,000 jobs elsewhere in the economy, principally in metallurgy, nonmetallic mining and food processing and in the beverage and tobacco industries.

Each green megawatt brought on line by photovoltaics destroyed 8.99 jobs elsewhere in the economy. The proposed 484 MW equals 4,351 jobs.

The total higher energy cost --the higher cost of renewable energy over the market price of carbon-based energy --between 2000 and 2008 was about $10 billion.

Response to Comment No. 31-03

Information on the existing social and economic characteristics of Amargosa Valley were derived from data available through well qualified sources such as the U.S. Census Bureau, US Dept of Commerce, Bureau of Economic Analysis, NV Dept of Employment, Training and Rehabilitation – Research and Analysis Bureau, and the Nevada State Demographer's office. The Project is consistent with the policies, goals, objectives and land use descriptions set forth in the Amargosa Valley Area Plan as the designated Special Development Area permits the uses contemplated.

Solar Millennium has worked with local, state, and federal agencies in order to comply with any land use provisions. Nye County and Solar Millennium have negotiated a Development Agreement for the construction and operation of this facility. This Agreement is provided in Appendix F.

It is outside the analysis of the EIS to determine if economic stimulus money is being utilized for companies based out of the U.S.

Comment No. 31-04

3.9.2.1 Population

The author of this Draft EIS a wide background brush to paint the landscape of this project by talking about the facts of Las Vegas and Pahrump, which nothing to do with the ROI, the Town of Amargosa Valley. Las Vegas and Pahrump are only looking for jobs to support their failing economies.

Table 3-18 Populations Estimates for Nevada, Clark County, and Nye County show that Amargosa Valley has had a 30% growth from 2000 to 2008 without this solar project. Again the statement that includes Beatty, "In contrast, the economies of Amargosa and Beatty have been historically been tied to government (Nevada Test Site), mining, and agriculture; slow population growth rates have reflected the declines of the economic sectors" is partially incorrect.

1. Beatty that is not in ROI has declined in population, not Amargosa Valley.
2. The population growth in Amargosa Valley that has not been included in the quote above is the people moving here to live and enjoy the life style, not the mining, test site, or agriculture.
3. Why do people live here in Amargosa Valley?
   a. The price of land is cheaper than in Las Vegas or Pahrump.
   b. The pace of life is slower and more peaceful.
   c. People enjoy the beautiful sunsets and the view the change of colors of the landscape.
   d. There is no excessive zoning and building codes.
   e. There are no excessive developer fees.
   f. My closest neighbor is ¼ of a mile from my house. This is not Las Vegas with only 10 feet between rooftops.
   g. The proposed solar projects will destroy our life style, as we know it today.

Response to Comment No. 31-04
The study area, or Region of Influence (ROI), varies depending on the resource being analyzed and the predicted locations of direct and indirect impacts from the Proposed Action or alternatives. The quoted portion of from the DEIS states why people historically moved to the area and not why people are currently moving there, and therefore is not incorrect. Population numbers are based on the best available sources, which are included in the DEIS and FEIS.

Comment No. 31-05

3.9.2.2 Housing

The short-term housing in the ROI in the form of hotels and motels is distorted by including Beatty and Pahrump.

The Table 3-20 Housing Characteristics source of the Number of Units (541) and the Vacant Units (198) is unrealistict.

1. Amargosa Valley has only one hotel, Longstreet with 59 rooms.
2. Amargosa Valley has three RV parks.
   a. Longstreet RV Park with 50 spaces
   b. Amargosa RV Park behind the Fort on Hwy. 95 with 84 spaces
   c. My Own Mobil Home & RV Park across the road from Longstreet with about 200 spaces

Response to Comment No. 31-05
The study area, or Region of Influence (ROI), varies depending on the resource being analyzed and the predicted locations of direct and indirect impacts from the Proposed Action or alternatives. The only available data on housing availability in Amargosa Valley was from the 2000 Census and it is understood that these may not reflect current conditions.

Comment No. 31-06

3.11.1 Regulatory Framework

1. **BLM Las Vegas RMP and Final EIS (1998)**
   a. The adopted 1998 Las Vegas Resource Management Plan does not include renewable energy development of geothermal, wind, and solar power; management of site type rights-of-way for renewable energy and other uses; visual resources management; land tenure adjustments to meet community growth needs; evaluation of existing and potential new Areas of Critical Environmental Concern; Off-Highway Vehicle

Response to Comment No. 31-06
This EIS does not tier to the 1998 Las Vegas Resource Management Plan. Until an updated RMP/EIS is approved by the BLM, the 1998 provides regulatory oversight for land management activities on BLM lands in the Southern Nevada District.

Comment No. 31-06 (continued)

Designation and Special Recreation Management; and Nye County FEMA floodplain maps.

b. An EIS should not be able to tier an outdated and obsolete document.

c. This ROW should not be approved by BLM until the Revision to the Las Vegas Resource Management Plan and Associated Environmental Impact Statement has been completed and approved for the Las Vegas Field Office and the Pahrump Field Office.

d. Clark County and Nye County have different Master Plans and Ordinances. The revision of the 1998 Las Vegas RMP has to be separated into two RMPs, one RMP for the Las Vegas Field Office and one RMP for the Pahrump Field Office.

2. **Nye County Comprehensive Plan (Nye County Board of Commissioners 1994)**

Comment No. 31-07

a. The BLM should not allowed to tier insufficient Nye County comprehensive Plan (NCCP), non existing tortoise plans, and plans that have not been developed for renewable energy projects except the September 23, 2009 update of the Amargosa Valley Area Plan (AVAP).

b. "It is Nye County's objective to establish long-term partnerships with the renewable energy sector, and it goals to: Support and encourage the effective use of energy; Promote the siting (sic) of renewable energy research or pilot technology and demonstration projects in Amargosa Valley; Become proactively involved in the federal and state efforts to route and approve renewable energy transmission corridors for distributing power from Amargosa Valley to the national grid." Is conjecture on the author of this Draft EIS. This objective and goals is not included in the NCCP.

i. At this time there are no transmission lines to transport power out of Amargosa Valley to the national grid.

ii. The negotiation to cross the Indian Reservation west of Las Vegas has not been accepted by the investors backing the solar projects because of the clause that tribal council can request that the power line easement can be cancelled at any time and the lines must be removed.

iii. Abengoa Solar, NVN086571 has requested BLM for an extension of 180 days of their Notice of Intent until they can secure a different method to transport the power out of Amargosa Valley.

Response to Comment No. 31-07
This EIS does not tier to the Nye County Comprehensive Plan. The reference to the Nye County Comprehensive Plan serves to inform the reader that other plans guide development activities in the area. The citation regarding the objectives and goals of Nye County is a direct quote from the Plan.

3. **Amargosa Valley Area Plan (Amargosa Valley Area Plan Committee 2009)**

Comment No. 31-08

a. The Draft EIS statement is again incomplete. The statement is only Guiding Principle A without listing the five subset statements and three other Principles B with 3 subset statements, C with 4 subset statements, and D. The Final EIS should list all four Principles with subsets that are located on page 4. When one sees these four Principles with the list of subsets, it is obvious that this Project is not compatible with the Area Plan.

b. The Area Plan was designed to amend and update the NCCP. The Nye County Board of Commissioner adopted AVAP September 23, 2009, which updated the NCCP.

Response to Comment No. 31-08
See response to comment 25-05.

Comment No. 31-09

3.11.3 Existing Land Use

a. "There is no state-owned land within the ROI" is not factually correct. The Nye County Assessor lists two APN for the State of Nevada in the Amargosa Tax District 08.

b. "While the BLM has exclusive jurisdiction over land use activities on land that it manages, the Amargosa Valley Planning Commission provides guidance to ensure that proposed projects within the Town Planning boundary are constructed and operated in a manner that is consistent with the standards set forth in the Amargosa Valley Area Plan (Amargosa Valley Area Plan Committee 2009)." Solar Millennium has not submitted a complete construction plan signed a Nevada Engineer to the Amargosa Town Planning Commission for review.

Response to Comment No. 31-09
The Development Agreement made between Nye County and the Proponent includes provisions that "require the Developer to consult with the Amargosa Town Advisory Board if a proposed amendment would, in the County's opinion, affect that entity."

Comment No. 31-10

3.11.4 Planed Land Use

Two jurisdictional entities' plans are referenced for future land use within the ROI; the 1998 Las Vegas RMP/EIS and the local AVAP.

Nye County has two sets of Ordinances, one set for the Pahrump Regional Planning District (PRPD) and one set for the rest of the County.

"... the County does not provide official guidance for new developments" is factually incorrect. See Bill No. 91-1.

Bill No. 91-1, Ordinance No. 135, Title: AN ORDINANCE AMENDING TITLE 16 OF THE NYE COUNTY CODE BY ADDING CHAPTER 16.20, THERETO; ADOPTING DIVISION OF LAND BY PARCEL MAP MEASURES; STATING GENERAL PROVISIONS INCLUDING PURPOSE AND COMPLIANCE; PROVIDING DEFINITIONS; PROVIDING FOR FORM AND CONTENT OF PARCEL MAPS; PROVIDING REQUIREMENTS FOR LOT SIZE, MONUMENTS AND ADDITIONAL REQUIREMENTS; PROVIDING DEVELOPMENT STANDARDS INCLUDING ROAD Dedications, ROAD IMPROVEMENTS, ROAD OBSTRUCTIONS, WATER SUPPLY AND SEWAGE DISPOSAL AND A PROCEDURE FOR CHANGING THE INTENDED USE OF A PARCEL; PROVIDING FORSEVERABILITY, REPEAL AND CONSTITUTIONALITY; PROVIDING FOR AN EFFECTIVE DATE AND OTHER MATTERS PROPERLY RELATING THERETO.

Land has to be parceled before the Nye County Assessor can issue APN for an assessment can be issued for property tax purposes.

The Waite 2009 quotation is from a Pahrump Valley Times newspaper article, which is the author's opinion that implies the comment, is from the AVAP.

The Special Development Area (SDA) is an AVAP Land Use Classification, is shown on Map 4 "Future Land Use". The SDA is for Solar, Wind, and Other developments, which is north of Farm Road.

"It also shows a specification of a 0.25-mile Open Space, Parks & Trails land use designation between residential areas and the area where the proposed Project is located" is factually incorrect. The area is RDR-Rural Density Residential for larger to vary large residential lots with wide open spaces and ample separation between neighboring uses designed to accommodate the "American West" lifestyle combining agricultural, farming ranching, and residential uses.

Response to Comment No. 31-10
The proposed Project is located on federal lands managed by the BLM, which are subject to land management regulations set forth under the Federal Land Policy and Management Act (FLPMA). The Amargosa Valley Area Plan is a local land planning guide for development in the Amargosa Valley planning area. While the BLM considers the recommendations of the Amargosa Valley Area, the BLM must comply with its requirements under FLPMA.

Comment No. 31-11

3.11.6.1 Future Transportation

"The plan identified multiple extension and improvement to secondary roads in the ROI, south of the Project area" is not a factually correct and

Response to Comment No. 31-11
Comment noted. Nye County has negotiated a voluntary Development Agreement with Solar Millennium to mitigate direct impacts to roads, emergency services, etc.

Comment No. 31-11 (continued)

complete statement. The Project also includes multiple extension and improvements extension and improvement to secondary roads within the Solar Field footprint. See AVAP Map 5 Transportation

Comment No. 31-12

3.12 Visual Resources

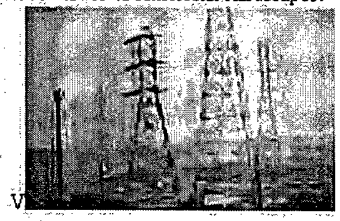
"Additionally, in order to comply with BLM VRM policy, the Visual Resource Inventor (VRI) that was used to develop agency visual management objectives within the Las Vegas RMP/EIS should be addressed and documented accordingly within the context of the Project."

The RMP/EIS has no VRI classes for Amargosa Valley and the VRI will develop mitigation on a projects specific basis. Interim visual management objectives are established where a project is proposed and there are no RMP, or Management Framework Plan (MFP) approved VRM objectives. These objectives are developed using the guidelines in Manual Section 8410 and must conform to the land use allocations set forth in the RMP, which covers the project area.

There is no MFP for this Project.

"The Amargosa Valley area is found north and west of Las Vegas between the municipalities of Pahrump and Beatty. Most of the landscape is not remarkable, characterized by flat bajada type desert county with creosoted bush communities and some minor hills and mountains. The eastern portion of the area borders NTS and exhibits colorful and rugged mountain ranges that breakup the monotony of the valley floor. Several cinder cones and Big Dune offer a unique scenic contrast to the Amargosa Valley."

When visual resources are not carefully managed and the visual impacts of poorly designed surface-disturbing activities are ignored, there can be dire consequences to the scenic values of American landscapes.



Response to Comment No. 31-12
The Visual Resource Inventory develops management objectives, not mitigation measures. The VRM outlines general guidelines for mitigation, but specific mitigation measures are project specific and based on project design information. General mitigation measures are covered in Section 4.12.6. A description of BLM supplied VRI is described in Section 3.12.2.

Comment No. 31-13

3.12.3.1 Distance Zones and Viewing Conditions

The viewing conditions of the residents along Sandy Lane (KOP 1) will be within 50 feet of the Project right-of-way and will be looking up, which is an inferior viewing position, at a 30 foot fence with a mural. These residents might not be able to see the evening sunset and the changing colors on the mountains.

The Project's take of the view of the residents along Sandy Lane is a violation of their civil rights. Page 7 of the NCCP makes the following statement,

Nye County citizens must be protected from arbitrary federal regulation through the recognition that Article X of the Bill of Rights of the U.S. Constitution states, "The powers not delegated to the United States by the Constitution nor prohibited by it to the states, are reserved to the states respectively, or to the people."

Response to Comment No. 31-13
In the context of this study, 'inferior' refers to location of viewer in relation to the project itself. As such, the close proximity of the viewer to the project was characterized as 'level'.

Comment No. 31-14

Issuing the ROW for this project is not one of powers delegated to BLM by the Constitution.

Withdrawal of public lands must include consideration of any private split estate rights which may be involved to ensure that private property is compensated for in accordance with the Article V of the Bill of Rights of the U.S. Constitution and Presidential Executive Order 12630. Any withdrawal of public lands must also consider the fiscal and economic impact on the tax base of Nye County with the objective being no net loss in tax base or economic output of Nye County. All withdrawals must be done in accordance with Article 1, Section 8, and Clause 17 of the U.S. Constitution.

Response to Comment No. 31-14

The BLM is authorized to process right-of-way applications in accordance with FLPMA, BLM right-of-way regulations, and other applicable federal laws.

The Constitution vests the U.S. Congress with control over federal lands. Congress has constitutionally delegated management authority over those lands to various federal agencies, including to BLM under the Federal Land Policy Management Act (FLPMA).

Comment No. 31-15

The authors of the Draft EIS has used the option, keep it very general (pass the buck) on the effects of foreseeable future on-the-ground actions that have not approved by BLM, Nye County or State of Nevada. The DEIS has tiered the 1998 Las Vegas RMP/EIS, which has no environmental analyze of the site-specific area of the Project.

The definition of Tiering: **Sec. 1508.28 Tiering.**

"Tiering" refers to the coverage of general matters in broader environmental impact statements (such as national program or policy statements) with subsequent narrower statements or environmental analyses (such as regional or basinwide program statements or ultimately site-specific statements) incorporating by reference the general discussions and concentrating solely on the issues specific to the statement subsequently prepared. Tiering is appropriate when the sequence of statements or analyses is:

(a) From a program, plan, or policy environmental impact statement to a program, plan, or policy statement or analysis of lesser scope or to a site-specific statement or analysis.

(b) From an environmental impact statement on a specific action at an early stage (such as need and site selection) to a supplement (which is preferred) or a subsequent statement or analysis at a later stage (such as environmental mitigation). Tiering in such cases is appropriate when it helps the lead agency to focus on the issues which are ripe for decision and exclude from consideration issues already decided or not yet ripe.

Programmatic versus site-specific NEPA documents, Court ruling on tiering.

"We are convinced that such specific analysis is better done when a specific development action is to be taken, not at the programmatic level." Resources Ltd. V. Robertson, 8 F.3d 1394, 1401 (9th Cir. 1993)

The DEIS should be edited and circulated for review again.

Response to Comment No. 31-15

This EIS does not tier to the 1998 Las Vegas RMP/EIS. The RMP/EIS is used to guide the decision framework for analyzing impacts to various resources within the BLM Las Vegas District, and to establish whether specific projects, such as the proposed Project, are consistent with that RMP. Site- and resource-specific analyses were conducted to evaluate the effects of the proposed project on the human and natural environment.

Respectfully submitted,

John Bosta

United States Department of the Interior

Pacific Southwest Region
FISH AND WILDLIFE SERVICE
Nevada Fish and Wildlife Office
1340 Financial Blvd., Suite 234
Reno, Nevada 89502
Ph: (775) 861-6300 ~ Fax: (775) 861-6301

May 3, 2010
File No. 84320-2009-CPA-0138

Memorandum

To: Field Manager, Pahrump Field Office, Bureau of Land Management, Las Vegas, Nevada

From: State Supervisor, Nevada Fish and Wildlife Office, Reno, Nevada

Subject: Review of Draft Environmental Impact Statement for the Amargosa Farm Road Solar Energy Project, Nye County, Nevada

Thank you for the opportunity to comment on the Draft Environmental Impact Statement (EIS) for the Amargosa Farm Road Solar Energy Project, Nye County, Nevada. We prepared this letter under the authority of and in accordance with provisions of the National Environmental Policy Act of 1969 [42 U.S.C. 4321 *et seq.*; 83 Stat. 852], as amended, the Endangered Species Act of 1973 [16 U.S.C. 1531 *et seq.*; 87 Stat. 884], as amended (Act), and other authorities mandating the Fish and Wildlife Service's (Service) concern for environmental values including the National Wildlife Refuge System. Based on these authorities, we offer the following comments for your consideration:

Desert tortoise

Comment No. 32-01

As discussed in our August 31, 2009, letter (Service File No. 84320-2009-FA-0138), we are concerned that the proposed project may adversely affect the federally listed desert tortoise *(Gopherus agassizii)* (Mojave population) and its habitat. A Biological Assessment for compliance with section 7 of the Endangered Species Act should include a thorough analysis of the potential effects from this project; identify measures to minimize mortality and injury to desert tortoises from project activities; and commit resources and funding for such measures.

A response to this comment is provided on a separate page following this comment document.

TAKE PRIDE IN AMERICA

Federally listed aquatic or water-dependent species

Comment No. 32-02 As discussed in our August 31, 2009, letter (Service File No. 84320-2009-FA-0138), we are concerned that the proposed project may affect federally listed water-dependent species and their designated critical habitat at Devils Hole and Ash Meadows National Wildlife Refuge (NWR). The Draft EIS failed to provide a meaningful analysis of effects to water-dependent species and their critical habitat at Ash Meadows NWR and Devils Hole from the proposed project. The Final EIS should provide a discussion how the error associated with the groundwater model construction and analysis provides uncertainty of the potential impacts to these species and their critical habitat from this project. Beyond the quantitative analysis using the Death Valley Regional Flow System Model, we recommend additional analysis using other available information such as Nevada State Engineer pumpage inventories. There should be discussion of interconnectedness between the regional groundwater basins and the aquatic and terrestrial ecosystems they support. Even small declines in spring discharge, small changes in water temperature, and small adjustments in soil or water chemistry resulting from groundwater withdrawals in the basin may affect species which inhabit spring pools and systems at Ash Meadows NWR and may render areas of habitat unsuitable for federally listed water-dependent plants. If the Final EIS identifies potential effects to federally listed aquatic or water-dependent species and their critical habitat from the proposed project, it should identify measures to avoid effects to these species and their critical habitats. If impacts to these sensitive species and their critical habitat cannot be avoided, the responsible Federal agency must initiate formal consultation pursuant to 50 CFR § 402.14.

Injury to Federal water rights

Comment No. 32-03 As discussed in our August 31, 2009, letter (Service File No. 84320-2009-FA-0138), we are concerned that the proposed project may injure Department of Interior water rights. The Draft EIS failed to provide a meaningful analysis of potential injury to these rights and did not consider: 1) how these purchased or leased water rights would be more fully utilized during solar energy production as compared to previous agricultural activities and 2) the incremental increase associated the lack of recharge of waters to local valley-fill aquifers with the consumptive use of groundwater. Should either or both of the above occur, net groundwater withdrawals from the Amargosa Desert basin will increase which would impact Federal water rights at Ash Meadows NWR and Devils Hole. The Final EIS should provide an appropriate analysis of impacts from the proposed project and identify measures to mitigate any injury to Federal water rights.

Responses to these comments are provided on a separate page following this comment document.

Thank you for the opportunity to participate in this process. If you have any questions, please contact Brian A. Novosak in the Nevada Fish and Wildlife Office in Las Vegas at (702) 515-5230. Please reference File No. 84320-2009-FA-0138 in future correspondence concerning this project.

Robert D. Williams

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RESPONSES TO COMMENT NO. 32-01 THROUGH 32-03

Response to Comment No. 32-01

The BLM is currently in consultation with the USFWS. A Biological Assessment has been submitted and is being reviewed by the USFWS. Mitigation measures will be finalized during this process.

Response to Comment No. 32-02

Comment noted. The BLM is currently in Section 7 consultation with the USFWS regarding this project.

Response to Comment No. 32-03

See responses to comments 05-01 and 24-02.

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NATIONAL SYSTEM OF PUBLIC LANDS

Solar Millennium LLC

COMMENT FORM

Amargosa Farm Road Solar Energy Project

Draft Environmental Impact Statement

JUDY PALMER

Name Organization (if applicable)

Address City State Zip Code

Add to Mailing List: YES [ ] NO [X]

Withhold personal information: YES [X] NO [ ]

COMMENT:

ENCLOSED

(Use additional sheets as needed.)

Public comments must be postmarked by May 3, 2010

SEND COMMENTS TO:

Gregory Helseth, Las Vegas Field Office, 4701 N. Torrey Pines Drive, Las Vegas, NV 89130

**Copies of comments will be available for public review at the local BLM office during regular business hours. Individuals requesting their personal information be withheld from public review or from disclosure under the Freedom of Information Act must check "Yes" in the appropriate box. Such requests will be honored to the extent allowed by law.*

Bureau of Land Management

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For more information, please contact Gregory Helseth (solar_millennium@blm.gov).

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Bureau of Land Management
Pahrump Field Office
Attention: Gregory Helseth
4701 North Torrey Pines Drive
Las Vegas, NV 89130

COMMENTS
Amargosa Farm Road Solar Energy Project
Draft Environmental Impact Statement

Judy Palmer

My comments regarding this project fall into four categories as follows: (1) inappropriate use of a wet-cooled solar thermal parabolic trough project as the alternative for comparison, (2) placement of solar thermal project using heat transfer fluid (HTF) in the midst of a rural community, (3) water usage, and (4) environmental justice.

Comment No. 33-01

1. Wet-cooled solar thermal parabolic trough project as the alternative for comparison

The use of a wet-cooled solar thermal parabolic trough project as the alternative for comparison to the proponents project is deceptive, as a wet-cooled solar power plant is not suitable for a desert environment, especially in a basin where the water is already overdrawn. Using of this alternative for comparison is therefore meaningless and serves only to artificially attribute positive benefits to the proponents chosen technology. A more realistic comparison would be photovoltaic (PV) technology.

Comment No. 33-02

2. Placement of solar thermal project using HTF in the midst of a rural community

The placement of this solar project in the midst of a rural community is unnecessary and potentially dangerous. All of the other pending solar projects (Cumulative impacts, fig 4-10) are along Hwy 95 and well away from residences and community facilities. Unlike the residents of Amargosa Valley, who are unlikely to realize any benefit from the project, travelers on Hwy 95 are destination-oriented and a large power plant would be not be intrusive. With minimal reconfiguration, it appears that all the pending projects could be accommodated without exposing the community of Amargosa Valley to the hazards and disruptions this plant will engender.

The heat transfer fluid (HTF) proposed is a mixture of toxic, combustible hydrocarbons that will be circulated in miles of pipes throughout the facility. According to the information on page 4-97, there will be close to 2 million gallons (1,849,337 gallons) of this substance in the system. In spite of the precautions outlined, it is to be expected that there will be leaks and spills, especially as the facility ages. In the event of a large leak, especially if under pressure, there is the risk of fire that could expose workers and community members to inhaling the products of combustion. Because this facility is close to a school, a senior center, and other community facilities, vulnerable populations (children and elders) would be placed at risk. It would seem more reasonable to place these HTF facilities along Hwy 95 where accidents would not carry such grave risks to the residents.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 33-03

3. Water usage (In general, the five mitigation measures suggested for water resources (A-3) seem weak and more a more robust plan for protecting this key resource should be developed.)

a. Buy and retire water rights: This facility is estimated to use 400 acre feet (130,340,400 gallons) per year of water in a basin that is already overdrawn, and where water levels are falling and projected to reach the court-mandated minimum at Devils Hole in the near future (3-36 to 3-40 and 4-42). If this project (and all the other pending solar projects) were required to buy and retire 3 agricultural water rights for each industrial water right used, it would go a long way toward correcting this downward trend.

b. Water conservation: Half the annual water usage by this facility (200 acre feet or 65,170,200 gallons) would be used to rinse the mirrors. Rinse (RO) water would be sprayed from a truck and allowed to drip off and evaporate. Collection, filtration, and reuse of this water could significantly reduce the water usage. Additionally, an automatic sprinkler system could improve air quality by reducing the amount of vehicular traffic at the facility. Doubtless other water conservation measures could be employed.

c. Mitigation to include removal of aggressive phreatophytes: The Amargosa Valley area is heavily vegetated with phreatophytes (Athel and Salt Cedar) (3-38, and 3-56 to 57, 3-71, 3-77, 3-133, 3-150). The EIS mentions the presence of these species but does not address the issue of phreatophyte control as a mitigation measure. Salt Cedar is especially invasive and its distribution in the area should be evaluated, as removal and control by the proponent could serve as a significant mitigation measure by reducing local evapotranspiration.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 33-04

4. Environmental justice:

The residents of Amargosa Valley will suffer considerably from this project and will see no benefit. They will be subjected to construction traffic, noise, fumes, and dust. Those close to the project will see a reduction in their property values. They also will be exposed to the potential risk of accidents at the facility both during construction and operation. It is unlikely that facility will provide a significant number of jobs to local residents, as most of the jobs will go to skilled labor in Las Vegas.

The most important measure to address these injustices would be locating the facility closer to Hwy 95 and away from this community. The proponents should also take more responsibility for fire and safety issues and not rely so heavily on the Amargosa Valley Volunteer Fire Department (2-32, 3-111, and 4-53). Fire fighting at this facility could pose significant health risks to local volunteers. The proponents should also be required to support the local community infrastructure (roads, schools, community center, library, etc) and contribute to the energy needs of low-income residents by such measures as subsidizing residential insulation and rooftop solar.

RESPONSES TO COMMENT NO. 33-01 THROUGH 33-04

Response to Comment No. 33-01

A wet-cooled solar facility is a viable alternative; however, the level of effort to acquire the amount of water needed for a wet-cooled solar project and the potential legal action from concerned stakeholders increases time and costs to develop a wet-cooled solar project in this region. Solar Millennium only develops solar thermal parabolic trough power plants.

Response to Comment No. 33-02

Comment noted. The BLM's purpose and need is to respond to Solar Millennium's application for a right-of-way on BLM managed lands. These lands were designated for disposal under the 1998 Las Vegas RMP/EIS. In evaluating whether to grant or deny Solar Millennium's application, BLM must comply with Title V of the Federal Land Policy Management Act, BLM right-of-way regulations, and other federal laws.

In addition, the risks associated with the hazardous materials for the Project have been fully evaluated in the FEIS. All of those risks were determined to be minor. There is no basis to believe that the Project would pose any serious risk to nearby residents or anyone else. There also exist adequate fire, police, and medical services nearby in the event of any unforeseen risk or other issue.

Response to Comment No. 33-03

In response to Comment A - See responses to comments 05-01 and 24-02.

In response to Comment B - The use of RO water is the standard industry practice for cleaning mirrors. At this time, Solar Millennium does not intend to capture and reuse mirror wash water.

In response to Comment C - The BLM acknowledges that control of aggressive phreatophytes is a concern in the arid southwest due to their high water consumption. However, in the Amargosa Valley, aggressive phreatophytes are primarily an issue on private lands, not federal lands. It is beyond the scope of this EIS and beyond BLM's authority to require phreatophyte control on private land as a mitigation measure

Response to Comment No. 33-04

As per the Development Agreement between Nye County and Solar Millennium, the Developer (Solar Millennium) agrees to assist in supplementing fire, police, and medical services through various means. For more specific information on how Solar Millennium will contribute please refer to the Developer Agreement in Appendix F. Any energy produced from the Project would be sold to a utility, which would then sell the energy to consumers. This inquiry should be directed to the appropriate utility. Accordingly, whether the proponent will contribute to the energy needs of low-income residents is outside the scope of this EIS.

United States Department of the Interior
NATIONAL PARK SERVICE
Death Valley National Park
PO Box 579
Death Valley, California 92328

IN REPLY REFER TO
L7619

May 11, 2010

Patrick Putnam, Field Manager
Pahrump Field Office
Southern Nevada District BLM
4701 N. Torrey Pines Drive
Las Vegas, Nevada 89130

Re: Comments on Draft EIS (DEIS) for Amargosa Farm Road Solar Energy Project

Dear Mr. Putnam:

Comment No. 34-01 Thank you for the opportunity to comment on the DEIS for the Amargosa Farm Road Solar Energy Project as a cooperating agency. As we have stated previously, the National Park Service (NPS) supports the efforts of the Nevada State Office of the BLM to promote renewable energy development projects on public lands. We hope that by working with the BLM on this project we can help to promote these efforts while still providing maximum protection for the Devils Hole pupfish and other Park resources.

Comment No. 34-02 In general, the NPS is concerned that the DEIS does not completely address project-related effects on NPS water rights and resources for Devils Hole. The Amargosa Desert Hydrographic Basin is over-appropriated according to the Nevada State Engineer. The Draft EIS indicates that existing pumping, including any water right leased for this project, will eventually have an effect on Devils Hole and Ash Meadows. The NPS's primary concern regarding this project is that it ***not*** increase the likelihood of injury to our senior water right for Devils Hole.

Comment No. 34-03 The NPS believes that in order for Solar Millennium to obtain the groundwater necessary to meet its long-term project demands of 400 acre-feet per year ***without*** impairing the senior water rights of the NPS, Solar Millennium must lease or purchase the full amount of water authorized under Permit 15893 and commit the same to supply the water demands of its project. Such a transfer should include the following two terms and conditions: (1) totalizing meters be installed on all wells associated with the project to record all groundwater withdrawals at the well head for Permit 15893; and, (2) a designation of the acres retired or "stripped" from the original permit for the life of the lease.

The NPS also has the following comments on the DEIS:

Comment No. 34-04 **Section 1.3 Project Location** refers to three water supply wells. Text should be revised to one water supply well.

Comment No. 34-05 **Project Area Figure 1-2** shows three water supply wells. Figure should be corrected to show which well will be used.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 34-06 **Section 2.3.6.2 Water Source** states that there are three wells under consideration. It is our understanding that only one well is currently under consideration. The text needs to be revised to reflect the water supply well that is under consideration.

Comment No. 34-07 **Table 2-4 Project Wells** lists the three wells originally under consideration. The table should be revised to reflect the current proposed water supply well. Note that the 6 year average pumping rate is different depending on which 6 year period is used. Between 2003 and 2008 (a six year period), the average *reported* water use for Permit 15893 was 391 acre-ft per year, not 288 as shown on the table.

Comment No. 34-08 **Section 2.3.6.4 Water Needs during Construction** describes the estimated water use for the duration of the project construction to be about 600 acre-ft per year for 3.25 years. The document states that construction water will be sourced from wells near the site and piped to the site for use by the contractor. It is not clear how this water will be administered. For example, will a temporary permit be requested from the Nevada State Engineer? Or will a short-term lease be negotiated for water from an existing user, and if so, will that require a temporary change in manner of use? The NPS would like to ensure that water used during construction is well documented, and that no net increase in water use occurs, even if the use is temporary.

Comment No. 34-09 **Section 2.4 Wet-Cooled Alternative** refers to the three wells identified under the dry-cooled alternative. These two sections need to be consistent in how they identify the proposed water supply for the dry-cooled alternative.

Comment No. 34-10 **Section 2.5.1 Agency-Preferred Alternative.** The NPS is concerned that a preferred alternative was not selected in the DEIS. Based on several conversations between NPS staff and BLM staff, our understanding is that the applicant has voluntarily chosen to go with the dry-cooled alternative. The NPS would strongly prefer selection of the dry-cooled alternative over the wet-cooled alternative to reduce impacts to the Devils Hole pupfish as a result of groundwater pumping. Although both action alternatives would impact pupfish, impacts from the wet-cooled alternative are significantly greater than from the dry-cooled alternative.

Comment No. 34-11 **Table 2-5 Summary of Impacts..., Water Resources - Sections 3.4 and 4.4.** The table refers to three existing wells under the proposed source of water, and a demand for 400 acre-ft per year, for the proposed action. The Table does not identify the proposed source of water or the impacts to water resources associated with the wet cooled alternative, or the impacts to water resources associated with the no action alternative.

Comment No. 34-12 **Section 3.1.5 Climate Change.** The second paragraph suggests that there is uncertainty about whether observed climate changes represent natural variability or are due to increasing emissions of greenhouse gases. This statement does not appear to be based on any substantive investigations and is in contradiction to the findings of the Intergovernmental Panel on Climate Change. The IPCC states that "there is very high confidence that the net effect of human activities ...has been one of warming". Also, the last sentence in this paragraph, citing Chambers, 2006, states that the following changes may be expected to occur, but then neglects to include any changes. This section needs to be revised to more accurately reflect the current understanding of climate change, including changes predicted for the Great Basin.

Comment No. 34-13 **Section 3.2.4 Geological Units in the Project Area** suggests that the valley fill aquifer, as described by Winograd and Thordarson, 1975, is present between about 650 - 960 feet deep, and

Responses to these comments are provided on a separate page following this comment document.

Comment No. 34-13 (continued) the lower carbonate aquifer is present between about 1,370 and 1,800 feet deep. This is not an accurate description of the conditions in the vicinity of the Project area. Based on monitoring wells in the vicinity of the Project area, depth to water in the alluvial basin-fill sediments was approximately 50 to 60 feet below land surface prior to agricultural development in the 1960s, and is currently about 100 to 120 feet below land surface. Depth to pre-Cenozoic basement rock is at least 1 to 2 kilometers in the vicinity of the Project area, so the carbonate rock aquifer in the vicinity of the Project area is at much greater depth than indicated by the text.

Comment No. 34-14 In addition, the description of Devils Hole and the source of water to springs in Ash Meadows is inadequate. Devils Hole is a collapse depression in the Bonanza King formation that intercepts the regional carbonate aquifer. In the vicinity of Ash Meadows, on the eastern side of the gravity fault, the carbonate rocks are at land surface. Springs in Ash Meadows are fed by the regional carbonate aquifer, where higher permeability rocks are juxtaposed against the lower permeability basin-fill sediments to the west and water is forced to the surface. An accurate description is important because it provides the basis for the concerns of the NPS and USFWS.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 34-15 **Section 3.2.6 Geological Hazards.** The text implies that subsidence in the Amargosa Valley is due to groundwater usage and complex spring activity. Note that according to Katzenstein and Bell (2005), the subsidence that has occurred in the vicinity of the Project area "represent aquifer response in close proximity to local groundwater withdrawals." Nearby groundwater monitoring wells that show more than 50 feet of decline since the 1960s are evidence of excessive groundwater pumping in the project area. In looking at the signals near the springs in Ash Meadows, Katzenstein and Bell (2005) assumed that water levels had not changed. However, that is not correct. In the Ash Meadows area, excessive pumping occurred in the 1970s, water levels have never fully recovered, and previously flowing wells are no longer flowing. Therefore, subsidence signals are more difficult to interpret in the Ash Meadows area and require further investigation. The text is misleading and needs to be revised.

Comment No. 34-16 **Death Valley Regional Flow System Figure 3-6.** The map legend incorrectly identifies the colors for the Ash Meadows and Alkali Flat-Furnace Creek Sub-regions.

Comment No. 34-17 **Section 3.4.6.7 Groundwater Pumping.**
This section needs to be revised to correctly describe the conditions in the basin. The perennial yield estimate of 24,000 acre-ft per year for Amargosa Valley includes 17,000 acre-ft that discharges from springs in Ash Meadows. The 17,000 acre-ft is not available for development and should not be included as "useable water". The amount of "useable water" is equal to 7,000 acre-ft (e.g., 24,000 - 17,000 acre-ft). An imbalance exists between the amount of usable water that was available for appropriation for development (e.g. the perennial yield minus the discharge from springs) and the amount that has been appropriated by the Nevada State Engineer. Therefore, the basin has been over-appropriated.

Comment No. 34-18 **Pg. 3-40, second paragraph.** The description of water use in the basin suggests that due to a decrease in mining, non-irrigation water use has decreased. This is not the case. Commercial use has steadily increased in the basin: from less than 5% in 1998, to about 10% in 2003, and to more than 22% in 2008. The increase in non-irrigation water use in the basin is an important trend to note in this discussion. In addition, overall water use has been increasing in the basin since the 1980s.

Comment No. 34-19 **Figure 3-7.** There appears to be a discrepancy in the location of the three proposed project wells, and the location of permitted water rights. For example, according to the

Comment No. 34-10 (continued) NSE mapped permitted wells, Section 23 only has 4 wells associated with water right permits, including Permit 15893, yet Figure 3-7 suggests that there are a total of five wells associated with water right permits. The same issue occurs in Section 14 where there is only one permitted water right, yet the figure suggests two, including the proposed project well. Although wells are often not plotted accurately within a quarter quarter section, the correct number of permitted water rights within a quarter section should be shown. The figure should be revised to correctly locate permitted wells, including the proposed project well.

Comment No. 34-20 **Page 3-43 through page 3-44.** The text indicates that because of an apparent error in the pumping dataset "it is not definite whether the model would produce an effect from other more distant pumping, but the later time results suggest otherwise." This statement is confusing and is inconsistent with the modeling report contained in Appendix 2. The long term pumping projections simulated with 2003 pumping amounts should not be significantly affected by a possible discrepancy in the pumping data for 1975. The predictive modeling simulations show 13.5 feet of drawdown at Devils Hole after 200 years of pumping at 2003 levels. Therefore, it is quite clear that the model shows that distant pumping occurring throughout the Amargosa Basin will have a significant impact at Devils Hole. The magnitude of the impact may not be entirely accurate due to uncertainties in the model, but there will clearly be an impact from pumping at current rates. This point must be made in the EIS.

Comment No. 34-21 **Page 3-44 Groundwater Model Summary.** The discussion focuses on the fact that the model overestimated the drawdown at Devils Hole from pumping. According to the DEIS, the overestimation, which becomes apparent in simulated water levels in the 1970s, must have been due to pumping from wells that were within 1 or two miles of Devils Hole since these wells were doing most of the pumping in the early 1970s. An overestimation in drawdown caused by discrepancies in pumping data from wells located in close proximity to Devils Hole does not mean that the model would also produce an overestimation in drawdown from wells further from Devils Hole. What is more notable is that the model achieved a remarkably similar shape in drawdown and recovery. The fact that the calibration is not accurate to within a foot at a particular point on a map is not significant given the scale of the model. The value of the model is in showing that the cumulative effect of pumping at current levels will cause an impact at Devils Hole and to Ash Meadows springs. The magnitude of the impact may be less clear, but this is still an important finding and should be noted.

Comment No. 34-22 **Page 3-89 Threats to the Species.** The text incorrectly states that the primary threat to the Devils Hole pupfish is decreased spring discharge. The primary threat is lowering of groundwater levels, not decreased spring discharge. In addition, if water levels drop below the ledge, the pupfish would have no habitat to feed upon, spawn or lay eggs. The fish would therefore likely go extinct, not just suffer population declines. This needs to be corrected.

Comment No. 34-23 **Section 4.4 Water Resources, Page 4-17.** GeoTrans, Inc. did not develop the groundwater model for the Death Valley regional flow system. They used an existing model developed by the USGS.

Comment No. 34-24 **Page 4-17, Scenario 1 (No Action) Results.** Text states that drawdown is predicted to be more than 5 feet over a large area. In fact, drawdown will be greater than 10 feet over a large area, including the area that encompasses Ash Meadows and Devils Hole. This point

Responses to these comments are provided on a separate page following this comment document.

Comment No. 34-24 (continued) needs to be made clear. In addition, the text suggests that drawdown is predicted to decrease rapidly in the Ash Meadows area, due to a buffering effect from capturing discharge from springs. It is not clear what evidence this statement is based upon. The rate of drawdown is quite steady at Devils Hole for the entire period of simulation.

Comment No. 34-25 **Page 4-18, Scenario 2 (Proposed Action) Results.** The text describes pumping from three wells, and should be revised to reflect pumping from one well. Historical use from the individual well needs to be described accurately. It has not been fully used over the last 5 years, 10 years or full period of record. The model report will also have to be revised to reflect pumping from only one well. Mirror washing is not likely to produce any recharge. The studies in the basin show that only fields that are irrigated fairly regularly produce return flow. Areas of native vegetation are characterized by an upward flux, not downward.

Comment No. 34-26 **Section 4.4.1 Proposed Action.** Text needs to be revised to reflect the current understanding of the proposed project with only one well.

Comment No. 34-27 **Section 4.4.1.1 Impacts from Construction.** Revise text to describe water use from only one well. The change application currently pending before the Nevada State Engineer suggests only 400 acre-ft is being sought. Therefore, an additional 200 acre-ft per year for the period of construction is likely to be needed to meet construction needs. This needs to be described accurately.

Comment No. 34-28 **Section 4.4.1.2 Operation, Water Use.** Text suggests two wells, with a third well for redundancy. The sources of water for the project need to be described consistently throughout the document.

Comment No. 34-29 **Section 4.4.2 Wet-Cooled Alternative.** This section needs to be revised to describe in better detail the potential impacts under this alternative. The increased water demand would mean less return flow from irrigation, additional water rights would be necessary and the impact of pumping more than 4000 acre-ft on Devils Hole would be much greater. Depending on what existing water rights were leased or acquired to meet the increased demand, they may not have been fully used and therefore could represent an additional demand on the system. These points should be addressed.

The DEIS failed to disclose results of groundwater modeling for the wet-cooled alternative, as was disclosed for the dry-cooled alternative. The EIS needs to fully analyze the impacts of each alternative. Results of groundwater modeling are important for determining the degree of impacts to the Devils Hole pupfish.

Comment No. 34-30 **Section 4.4.3 No Action Alternative.** The impacts to sensitive water resources under the No-Action alternative may not be fully quantified, but they are projected to be significant based on the evidence presented in the modeling report. Water levels will eventually decline at Devils Hole and discharge will be reduced from springs. What cannot be determined with accuracy at this point is the timing and magnitude of the impacts.

Comment No. 34-31 **Section 4.6.1.4 Mitigation.** The NPS remains hopeful that mitigation measures will be adequate to offset impacts of water use to the Devils Hole pupfish. As mitigation measures are still under development, we look forward to commenting on them when they are complete. We hope that we will have the opportunity to review the proposed measures prior to their release in the FEIS.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 34-32 **Section 4.17.7.4 Water Resources.** This section needs to describe the cumulative effects of multiple projects. Water usage based on air cooled verses wet cooled technologies can be estimated based on the size of the facility. Many of the developers have provided proposed Plans of Development to the BLM and describe estimated water use in publically available documents. The cumulative impacts from multiple projects need to be clearly analyzed in the EIS.

Comment No. 34-33 **Section 4.12.5 Mitigation.** The NPS is pleased that a mitigation measure has been put in place to minimize impacts of nighttime lighting on dark night sky. However, the mitigation measure is vague and would be difficult to enforce. We hope that the applicant will truly put forth their best effort to minimize impacts from nighttime lighting. However, if they do not we expect that the BLM will enforce this mitigation measure. Cumulative impacts to dark night sky from multiple projects should be assessed as part of the visual resource analysis. Death Valley National Park currently has exceptional dark night skies and any net increase in fugitive light would impact the park.

Responses to these comments are provided on a separate page following this comment document.

We look forward to continued work with you and your staff on this and other solar renewable projects in the Amargosa Valley.

Sincerely yours,

Sarah Craighead
Superintendent

cc: Regional Director
NPS Pacific West Regional Office
1111 Jackson Street, Suite 700
Oakland, CA 94607

cc: Alan Schmierer
NPS Pacific West Regional Office
1111 Jackson Street, Suite 700
Oakland, CA 94607

cc via email: Dan_McGlothlin@nps.gov; Jennifer_Back@nps.gov, Gregory_helseth@blm.gov

RESPONSES TO COMMENT NO. 34-01 THROUGH 34-33

Response to Comment No. 34-01

Comment noted. The BLM appreciates the commenter's participation in the EIS process.

Response to Comment No. 34-02

See responses to comments 05-01 and 24-02.

Response to Comment No. 34-03

See responses to comments 05-01 and 24-02.

Response to Comment No. 34-04

The reference to three wells has been changed in the FEIS to reflect use of only one well.

Response to Comment No. 34-05

The reference to three wells has been changed in the FEIS to reflect use of only one well.

Response to Comment No. 34-06

The reference to three wells has been changed in the FEIS to reflect use of only one well.

Response to Comment No. 34-07

The reference to three wells has been changed in the FEIS to reflect use of only one well.

Response to Comment No. 34-08

Solar Millennium has filed an application with the Nevada State Engineers Office to change the place and manner of use of an existing certificated water right near the Project site. To allow for redundancy should one of the wells fail, Solar Millennium intends to drill a new well and move the point of diversion to a location just west of the current well. Meters will be placed on both wells to ensure there is no exceedance of the permissible annual duty. Pending permitting by the Nevada State Engineer, the Proponent will lease 400 afy for project operations, while the water right holder retains the remaining 203 afy to be used for agriculture purposes. During construction, the Proponent will lease the remaining 203 afy to meet their 600 afy water needs during construction. A new pipeline will be constructed between the well and the project site to convey the water needed for project construction and operation. Appropriate permits from Nye County would be obtained to construct and operate the new pipeline.

Response to Comment No. 34-09

The reference to three wells has been changed in the FEIS to reflect use of only one well.

Response to Comment No. 34-10

The BLM preferred alternative is the Proposed Action (dry-cooled alternative).

Response to Comment No. 34-11

Since it is unknown where water for a wet-cooled alternative would ultimately be obtained, the assumption is made that any water acquired would be sourced from an existing water right owner(s) who would be willing to sale or lease their water right. It could be assumed that the water that would be acquired for the wet-cooled option is fully used on an annual basis by the current water rights owner(s) in the current capacity.

Under the No Action alternative, the BLM assumes current conditions and trends would continue.

Response to Comment No. 34-12

This EIS has to look at the broad amount of information available about climate science. The IPCC report is referenced in the document, but cannot be the only information on the topic utilized. Therefore the EIS cannot make statements about a topic based off one piece of information, and must address that there is uncertainty. The last sentence in the paragraph, citing Chambers, 2006, lists expected changes to occur in the following paragraph and bullet point list. Since the sentence was followed up with the corresponding information in the DEIS no changes have been made regarding this comment.

Response to Comment No. 34-13

The information cited is from Winograd and Thordarson (1975). The BLM acknowledges there are differences in opinions regarding groundwater flow and occurrence in the carbonate aquifer system.

Response to Comment No. 34-14

See response to Comment No. 34-13.

Response to Comment No. 34-15

Text in Section 3.2.6 has been updated in the FEIS to reflect that observed subsidence in Amargosa Valley is attributed to groundwater usage, as it is not clear exactly what Katzenstein and Bell (2005) meant by "hydrologic processes related to the abundant spring activity" near Amargosa Flat and Ash Meadows National Wildlife Refuge.

Response to Comment No. 34-16

Figure has been revised.

Response to Comment No. 34-17

The BLM acknowledges the Nevada State Engineer has determined the perennial yield in the Amargosa Desert Hydrographic Basin to be 24,000 afy, and the basin is over-allocated. Sections 3. 4 and 4.4 in the FEIS have been expanded to describe conditions and trends in the basin.

Response to Comment No. 34-18

Sections 3. 4 and 4.4 in the FEIS have been expanded to describe conditions and water use trends in the basin.

Response to Comment No. 34-19

The location of the well to be used for this project has been updated on the maps included in the FEIS.

Response to Comment No. 34-20

The quoted statement was referring to the 1998 model not the updated model where the pumping dataset was corrected. The text has been revised to say, "Even with the model limitations and assumptions presented above, the model can still be used as a qualitative tool to provide information on the potential impacts to local groundwater resources.

Response to Comment No. 34-21

The following statement will be added to the text: An important conclusion from Scenario 1 is that the cumulative effect of 2003 groundwater withdrawal levels continuing into the future will cause an impact to Devils Hole and Ash Meadows even though the magnitude and timing of this impact is uncertain.

Response to Comment No. 34-22

In response to comment, the text has been updated in the Final EIS.

Response to Comment No. 34-23

The statement has been modified to clarify the citation.

Response to Comment No. 34-24

The text has been changed from 5 ft to 10 ft as suggested. The buffering effect occurs in the model due to the drawdown cone reaching a significant discharge area (Ash Meadows spring complex), not just Devils Hole. The statements referring to the buffering effect will be removed from the text for clarity.

Response to Comment No. 34-25

The model report and section 4.4 has been rewritten to reflect pumping from one well, not three. Statements discussing unknown recharge from mirror washing will be deleted from the text.

Response to Comment No. 34-26

See response to comment 34-25.

Response to Comment No. 34-27

See response to comment 34-08.

Response to Comment No. 34-28

Comment noted. The FEIS has been updated to expand the description of water requirements during construction and operation.

Response to Comment No. 34-29

Section 4.4.2 has been modified in the FEIS to clarify certain statements. A groundwater model for the wet-cooled alternative is not feasible since it is unknown where water for a wet-cooled alternative would ultimately be obtained. The assumption is made that any water acquired would be sourced from an existing water right owner(s) who would be willing to sale or lease their water right. It can be assumed that the water that would be acquired for the wet-cooled option is fully used on an annual basis by the current water rights owner(s) in the current capacity.

Response to Comment No. 34-30

The following sentence has been added: "The magnitude and timing of these impacts is unknown and cannot be determined with accuracy at this time." Also, in a previous sentence, "with unknown impacts" has been replaced with "producing impacts."

Response to Comment No. 34-31

See responses to comments 05-01 and 24-02.

Response to Comment No. 34-32

The DEIS followed Council on Environmental Quality guidelines in developing the cumulative analysis. In addition, the final EIS contains substantive improvements in the cumulative analysis, and the reader is referred to Section 4.17 of the FEIS for further information on cumulative analysis.

Response to Comment No. 34-33

Impacts to night sky conditions of Death Valley National Park were not assessed, due to preliminary design plans not containing a lighting plan. The Proponent has, however, committed to specific mitigation measures that will be incorporated into the FEIS and will

mitigate impacts to night sky to the greatest extent feasible. To this end, lighting impacts from future projects within the Region of Influence are not known in order to inform the Cumulative Impacts. However, future lighting plans will be reviewed and approved by the BLM in an effort to reduce cumulative effects to night sky.

DRAFT ENVIRONMENTAL IMPACT STATEMENT

AMARGOSA FARM ROAD SOLAR ENERGY PROJECT NVN-084359

COMMENTS OF THE OETTINGER FAMILY

1318 NORTH SANDY LANE

AMARGOSA VALLEY NEVADA 89020

4 MAY 2010

Comment No. 35-01

Congratulations on a very fine job in mitigating our earlier concerns. This draft is very well done and addressed most of our worries. Thank you.

Our remaining concerns revolve around the loss of view to the west from our home. We feel that this is a takings and as such need to be addressed.

Comment No. 35-02

We also would wish clarification about our ability to access public lands from our home. Will the 730 feet between our property and the wind fence be under the solar plants' control or do we have free access for horseback riding or other activities?

Comment No. 35-03

We brought up previously about the reflected glare during the morning hours. The wind fence is transparent and only 30' tall, will there be any mitigation for the glare issue.

Comment No. 35-04

The Nye County road dept said that North Sandy lane between Desert Senior and Frontier cannot be paved unless BLM deeds easement to the county for the remaining width (40'). The county will not pave any more single lane roads. Dust from increased traffic on Sandy Lane due to the projects' construction workers leaving and returning will be bothersome to the residents without paving! Will a stipulation for the easement please be put as part of the BLM acceptance and approval of the project!

Comment No. 35-05

During construction activities how will the control of vermin leaving the site be controlled? We don't feel we should have to deal with extra mice and snakes and bugs!

Comment No. 35-06

Lastly, dust control of the site while construction activities are in progress, and after the plant is turned over are a real concern. We would like to see more detail in the final statement.

Michael and Sherry Oettinger

Responses to these comments are provided on a separate page following this comment document.

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RESPONSES TO COMMENT NO. 35-01 THROUGH 35-06

Response to Comment No. 35-01

Sensitive viewers within the foreground distance zone with level, unobstructed views would have the highest impacts as stated in section 4.12 (i.e. the project would dominate the view).

Response to Comment No. 35-02

The area between the eastern property line and Sandy Lane will be open to public access. Per the Development Agreement by and between Nye County and the Proponent, landscape design features will be incorporated into the project design, including landscape buffers between the eastern property line and Sandy Lane. Specific details have not been finalized and provided to the BLM.

Response to Comment No. 35-03

The wind fence is primarily considered as design feature to decrease wind effects on the solar array and as a result, the fabric on the fence is partially transparent. In this regard, the fence is considered a mitigation measure in that it decreases visibility of the solar array and other project elements as well as reducing the effects of glint and glare.

Response to Comment No. 35-04

Access to the project site will be via Valley View Blvd., which is approximately 3.5 miles west of Sandy Lane. Sandy Lane would not be used during construction or operations.

Response to Comment No. 35-05

Surveys of the Project area conducted in 2009 found relatively low densities of small mammals, snakes, and invertebrates. It is anticipated that any individuals of these species will preferentially move to the natural habitats to which they are accustomed, such as the native desert areas to the north and west or to the agricultural fields to the south.

Response to Comment No. 35-05

See response to Comment No. 24-06.

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To Whom it May Concern,

We would like to submit the following information and request to the appropriate officials in the US Fish and Wildlife Service and the Bureau of Land Management. Solar Millennium has submitted an application for a Right of Way for over 7,800 acres on public lands in the Amargosa Farm area near Amargosa Valley, Nevada to develop a 4,000 acre parabolic trough solar energy facility.

We have submitted comments on the Draft Environmental Impact Statement, however, the comment deadline has passed and we have come across some important information concerning biological resources, that has been surprisingly overlooked by the Bureau of Land Management. Listed below is a reference from the Journal, *Copea*, describing the genetic significance of isolated desert tortoise (*Gopherus agassizii)* populations in the Amargosa Desert and Pahrump Valley. It is suggested that parts of this population could qualify as an Evolutionarily Significant Units (ESU).

We are aware that the Solar Millennium proposed project site does not sustain a high density population of desert tortoise, but after reviewing Solar Millennium's contractor's biological survey reports submitted to BLM by Tierra Biological Consulting, we have noted some problems with the surveys and information provided to the BLM.

Comment No. 36-01

Problem Number 1: All surveys were conducted during the spring season of only 2009. This was a drier than average year. Even a good biological field crew will have limited survey results from a drier than average year. The spring of 2010 received abundant rainfall, yet all of the data has gone unrecorded due to a fast tracking schedule that seems to prioritize approval of the ROW over reviewing sound biological survey information first.

The survey information states no desert tortoise were found on the site and only "class 4" burrows were observed. We observed an active desert tortoise burrow on the site on April 26th, 2010. Below is a photograph.

The GPS coordinates are: NAD27, UTM zone 11, e-542777, n-4047023

Response to Comment No. 36-01
See response to comment 20-25.
As stated in Appendix A.6 mitigation measures WL-6, clearance surveys will be conducted for Desert Tortoise in accordance with all State and Federal regulations. In addition, as stated in Appendix A.6, biological monitors will be on site to ensure that no tortoises are harmed during the construction process. Appropriate mitigation measures will be developed during the consultation process between BLM and U.S. FWS under the ESA. A Biological Assessment has been submitted and will Opinion when this inter-agency consultation is complete.

Approximate location of tortoise burrow on Solar Millennium project site, north of Amargosa Farm Rod, near Casada Rd.

Comment No. 36-02

Problem Number 2: The Tierra Biological Resources Report (written by retired Tonopah BLM field manager Bill Fisher, now desert tortoise consulting biologist) states that "the vegetation within the project boundaries is generally very sparse and dominated by creosote and burrobush (Photo 3-1), with very little herbaceous growth most of which is confined to the shrub canopies or just a short distance beyond."

That statement does not apply to the spring season of 2010. The annual vegetation is far more abundant on the site this year than it was when the surveys were conducted. The point is, one field season does not represent an accurate account of the biological resources of the Mojave Desert.

While we do not expect that a new survey would find an abundance of desert tortoise, we do believe that a more objective survey may find more desert tortoise than the Tierra report concludes. High density numbers are not the only important attribute of a desert tortoise population. If there is a potential Evolutionarily Significant Unit of tortoise on the site, we need a full analysis in the EIS.

We believe that the BLM has not required Solar Millennium to conduct a good enough biological survey of the site. We would like to request that Solar Millennium be required to conduct at least on more additional season of biological surveys before BLM issues a Record of Decision. We would also like to request a written response to this letter.

Response to Comment No. 36-02
See response to comment No. 36-01.

Thank you for your time,
Sincerely,

Kevin Emmerich
Laura Cunningham
Basin and Range Watch
P.O. Box 70
Beatty, NV 89003
atomictoadranch@netzero.net

Please review the below reference:

Genetic Delineation of Management Units for the Desert Tortoise, *Gopherus agassizii*, in Northeastern Mojave Desert HUGH B. BRITTEN, BRETT R. RIDDLE, PETER F. BRUSSARD, RON MARLOW, AND THOMAS E. LEE JR. 1997. Copeia, 1997(3), pp. 523-530

Moritz (1994a, 1994b) provided a useful dichotomy between Evolutionarily Significant Units (ESUs) and Management Units (MUs) in recent reviews of the application of genetic data to conservation questions. Generally, population segments within a species' geographic range are considered ESUs if they possess two criteria: (1) "substantial" reproductive isolation from other such segments; and (2) evolutionarily important genetic uniqueness (Waples, 1991). MUs can be distinguished by significant nuclear or mitochondrial gene frequency differences (Moritz, 1994b). Populations with divergent gene frequencies likely exchange so few migrants that they exhibit substantive demographic independence and should be managed appropriately (Moritz, 1994b).

Finally, tortoise populations sampled from Amargosa Desert and Pahrump Valley form another MU because they possess the GPI-b allele at high frequencies. The Piute Valley is partially isolated from the southern Las Vegas Valley by the McCullough Range to the west and north and the Colorado River (Lake Mead) to the east. Similarly, Amargosa Desert/Pahrump Valley is almost completely isolated from tortoise habitat to the east by the Spring Mountains and the Spotted and Specter Ranges. In both cases, drift and founder events may account for divergent allozyme and mtDNA haplotype frequencies. Delineation of DWMAs was based on both ecological and genetic considerations (USFWS Recovery Plan, 1994, unpubl.), and their locations and boundaries have not been finalized.

Similarly, populations in the Amargosa Desert and Pahrump Valley are not contained within any proposed DWMA.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

MAY 17 2010

Attn: Gregory Helseth
Renewable Energy Project Manager
BLM Pahrump Field Office
4701 North Torrey Pines Drive
Las Vegas, NV 89130-2301

Subject: Draft Environmental Impact Statement for the Solar Millennium Amargosa Farm Road Solar Energy Project, Nye County, Nevada [CEQ# 20100083]

Dear Mr. Helseth:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the Solar Millennium Amargosa Farm Road Solar Energy Project, Nye County, Nevada. Our comments are provided pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

EPA supports increasing the development of renewable energy resources in an expeditious and well planned manner. Using renewable energy resources such as solar power can help the nation meet its energy requirements while minimizing the generation of greenhouse gases. While renewable energy facilities offer many environmental benefits, they are not without the potential for adverse impacts. Appropriate siting and design of such facilities is of paramount importance if the nation is to make optimum use of its renewable energy resources without unnecessarily depleting or degrading its water resources, wildlife habitats, recreational opportunities, and scenic vistas.

The Bureau of Land Management (BLM) has identified thirty-four proposed renewable energy projects as "fast track" projects that are expected to complete the environmental review process and be ready to break ground by December 2010 in order to be eligible for funding under the American Recovery and Reinvestment Act. Twenty-eight of these projects are located in our Region; 13 of them are located in Nevada. We are aware that many more projects that have not been designated "fast-track" are also being considered by BLM. Many, if not all, of these projects, fast track or otherwise, are proposed for previously undeveloped sites on public lands. In making its decisions regarding whether or not to grant rights-of-way for such projects, we recommend that BLM consider a full range of reasonable alternatives to minimize the adverse environmental impacts. Such alternatives could include alternative technologies or altered project footprints at the proposed location, as well as alternate sites, such as inactive mining or other disturbed sites that may offer advantages in terms of availability of infrastructure and less vulnerable habitats. Given the large number of renewable energy project applications currently under consideration, particularly in the Desert Southwest, we encourage BLM to apply its land

management authorities in a manner that will promote a long-term sustainable balance between available energy supplies, energy demand, and protection of ecosystems and human health.

On August 6, 2009, EPA provided extensive scoping comments for the Amargosa Farm Road Solar Energy Project, which included detailed recommendations regarding purpose and need, range of alternatives, water resources, and other resource areas of concern. On May 3, 2010, we requested and received an informal two-week extension of the comment period for the DEIS. We appreciate your willingness to provide us with additional time to complete our review.

Comment No. 37-01

Based on our review of the DEIS, we have rated the document as *Environmental Objections – Insufficient Information* (EO-2). Please see the enclosed "Summary of EPA Rating Definitions." An "EO" signifies that EPA's review of the DEIS has identified potential significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may involve substantial changes to the project. A "2" rating signifies that the DEIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment.

A response to this comment is provided on a separate page following this comment document.

We are particularly concerned about the potential impact of the proposed project to waters of the United States, and this is the basis for our "EO" rating. We understand that the jurisdictional delineation of waters of the United States has not been finalized and the full extent of impacts has not been determined. Based on the preliminary analysis, however, the impacts appear to be of a magnitude that is a significant environmental concern, especially within an arid ecosystem. We are also concerned about the long-term availability of groundwater in the Amargosa Valley, given that future appropriations have already been curtailed. Finally, we are concerned about the indirect and cumulative effects associated with the influx of at least 10 other large-scale solar energy projects proposed in the Amargosa Valley, and the potential impacts on aquatic and riparian communities at Devils Hole and Ash Meadows National Wildlife Refuge.

The Final Environmental Impact Statement (FEIS) should clarify the extent of the jurisdictional waters, demonstrate that the proposed project is the *Least Environmentally Damaging Practicable Alternative* (LEDPA), and identify measures that could mitigate the impacts. It should include a robust discussion of all mitigation measures proposed for the project. To facilitate this action, EPA staff, the U.S. Army Corps of Engineers, BLM, and the project proponent and consultants met on May 13, 2010 and toured the proposed project site to: 1) discuss the geographic extent of jurisdictional waters on the project site and the direct, indirect/secondary impacts that would occur as a result of the proposed project; 2) identify opportunities to avoid and minimize impacts to waters of the U.S.; 3) review the process for identifying the LEDPA; and 4) outline the requirements of a compensatory mitigation plan. We are available for further discussion of these matters and our comments on the DEIS.

EPA appreciates the Bureau's coordination to date and the opportunity to provide input on this project. Please send one hard copy of the Final EIS and two CD ROM copies to this office at the same time it is officially filed with our Washington D.C. Office. If you have any questions, please contact me at 415-972-3843, or contact Ann McPherson, the lead reviewer for this project. Ann can be reached at 415-972-3545 or mcpherson.ann@epa.gov.

Sincerely,

Enrique Manzanilla, Director
Communities and Ecosystem Division

Enclosures: Summary of EPA Rating Definitions
Detailed Comments

Cc: Ron Wenker, Bureau of Land Management, Nevada State Office, Reno, NV
Colonel Thomas C. Chapman, U.S. Army Corps of Engineers, Sacramento, CA
Kristine Hansen, U.S. Army Corps of Engineers, Reno, NV
Amy M. LaVoie, U. S. Fish and Wildlife Service, Las Vegas, NV
Sharon McKelvey, U.S. Fish and Wildlife Service, Amargosa Valley, NV
Dan McGlothlin, National Park Service, Ft. Collins, CO
Wayne R. Belcher, U.S. Geological Survey, Henderson, NV

SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

ADEQUACY OF THE IMPACT STATEMENT

Category "1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category "2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyzes, or discussion should be included in the final EIS.

Category "3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyzes, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.

U.S. EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE SOLAR MILLENNIUM AMARGOSA FARM ROAD SOLAR ENERGY PROJECT, NYE COUNTY, NEVADA, MAY 17, 2010

Project Description

Solar Millennium, LLC, has submitted a right-of-way application to the Bureau of Land Management (BLM) to construct two concentrated solar thermal parabolic trough power plant facilities with a combined capacity of 464 megawatts (MW). The proposed project would consist of two 232 MW dry-cooled power plants, solar fields composed of parabolic trough mirrors, and thermal storage tanks containing molten salt, capable of producing additional energy for 3 1/2 hours after sundown. Water needs for the proposed project will be met by one of two options: 1) leasing and conveying groundwater from three existing wells nearby; or 2) purchasing existing water rights from the three wells and moving the point of diversion to the power block areas. The proposed design also includes a stormwater retention pond, water pipeline, bioremediation area, and switchyard and will utilize a 230-kilovolt (kV) transmission line connecting the plant to the nearby Valley Electric Substation. The project facilities would be located on approximately 4,350 acres of public land within a 6,320 acre right-of-way (ROW) in Amargosa Valley about 80 miles northwest of Las Vegas, Nevada. Each facility is expected to operate for approximately 30 years.

Compliance with Clean Water Act Section 404

Comment No. 37-02

In our scoping comments (August 6, 2009), EPA noted that the project applicant should coordinate with the U.S. Army Corps of Engineers (Corps) to determine if the proposed project requires a Section 404 permit under the Clean Water Act (CWA). The Draft Environmental Impact Statement (DEIS) presents no information on this topic except to note that activities resulting in dredging or filling of jurisdictional waters of the United States (WUS or jurisdictional waters), which can include drainages and ephemeral washes, require authorization under a Section 404 Permit (pg. 3-27).

The purpose of the CWA is to restore and maintain the chemical, physical, and biological integrity of waters of the United States. These goals are achieved, in part, by prohibiting discharges of dredged or fill material that would result in avoidable or significant adverse impacts on the aquatic environment. Pursuant to Section 404 of the CWA, discharge of dredged or fill material to WUS requires a permit, issued by the Corps. If a permit is required, EPA will review the project for compliance with the *Federal Guidelines for Specification of Disposal Sites for Dredged or Fill Materials* (40 CFR 230) (Guidelines), promulgated pursuant to Section 404(b)(1) of the CWA. The burden to demonstrate compliance with the Guidelines rests with the permit applicant. The Guidelines contain four main requirements that must be met to obtain a Section 404 permit:

a) Section 230.10(a) prohibits a discharge if there is a less environmentally damaging practicable alternative to the proposed project.

A response to this comment is provided on a separate page following this comment document.

Comment No. 37-02 (continued)

b) Section 230.10(b) prohibits discharges that will result in a violation of water quality standards or toxic effluent standards, jeopardize a threatened or endangered species, or violate requirements imposed to protect a marine sanctuary.
c) Section 230.10(c) prohibits discharges that will cause or contribute to significant degradation of waters. Significant degradation may include individual or cumulative impacts to human health and welfare; fish and wildlife; ecosystem diversity, productivity and stability; and recreational, aesthetic or economic values.
d) Section 230.10(d) prohibits discharges unless all appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem.

Recommendation:
Discuss and demonstrate compliance with the Guidelines in the Final Environmental Impact Statement (FEIS).

Responses to these comments are provided on a separate page following this comment document.

Geographic Extent of Waters of the United States

Comment No. 37-03

EPA is concerned about the potential adverse impact to aquatic resources that would result from the project, as proposed. The DEIS contains no information on the geographic extent of waters of the United States on the project site. EPA has received two documents[1] submitted on behalf of the project proponent to the Corps that assess CWA jurisdiction at the proposed project site. These two documents are currently under review by the Corps and EPA. At present, we are unable to determine the full extent of project impacts to jurisdictional waters. We are concerned that the extent of such waters may be underestimated. EPA met with the Corps, BLM, and others on May 13, 2010 at the project site to discuss this issue further.

Recommendation:
The FEIS should include a final determination of the extent of waters of the United States at the project site, and address any issues raised as a result of the EPA/Corps site visit.

Analysis of Alternatives -- 40 CFR 230.10(a)

In order to comply with the Guidelines, the applicant must comprehensively evaluate a range of alternatives to ensure that the *"preferred"* alternative is the *Least Environmentally Damaging Practicable Alternative* (LEDPA). Identification of the LEDPA is achieved by performing an alternatives analysis that estimates the direct, indirect, and cumulative impacts to jurisdictional waters resulting from a set of on- and off-site project alternatives. Project alternatives that are not practicable and do not meet the project purpose are eliminated. The LEDPA is the remaining alternative with the fewest impacts to aquatic resources, so long as it does not have other significant adverse environmental consequences. Only when this analysis has been performed can the applicant and the permitting authority be assured that the selected alternative is the LEDPA (40 CFR 230.10(a)).

[1] *Delineation of Wetlands and Waters of the U.S. for Amargosa Farm Road Solar Power Project*, Nye County, Nevada, August 2009, and *Appendix A: Drainage C Addendum*, March 1, 2010, prepared for Solar Millennium, LLC, Berkeley, CA, by Tierra Data Inc., Escondido, CA.

Comment No. 37-04

As currently proposed, we cannot determine whether or not the preferred alternative represents the LEDPA. It is not possible to determine the LEDPA in the absence of an approved determination of the geographic extent of waters of the United States on the project site. The DEIS contains only a cursory evaluation of three off-site alternatives (pgs. 2-3 to 2-4), with minimal consideration of practicable alternatives in light of costs, logistics, and existing technology as required under the Guidelines. Furthermore, the DEIS does not include a formal analysis of on-site alternatives that may reduce impacts to jurisdictional waters. For example, the DEIS provides only cursory information on the potential for reconfiguration or redesign of building footprints, drainage channels, roads, or project downsizing that could result in avoidance of jurisdictional waters.

The DEIS states that the project proponent has considered the alternative of developing the proposed project as a single 232 MW plant, and that building one plant would have fewer environmental impacts (pg. 2-4). The single plant alternative is rejected, in part, because two plants allow for economies of scale and a single plant would not be as effective in meeting the project objective of attainment of energy mandates and objectives. Based on the information in the DEIS, it appears that the single plant alternative may be practicable and less environmentally damaging to jurisdictional waters when compared to the proposed project alternative. As such, a single 232 MW plant would be considered an on-site *less environmentally damaging, practicable alternative*, pursuant to the Guidelines.

Recommendation:
EPA recommends that BLM include analyses of on- and off-site alternatives in the FEIS and identify the LEDPA. Sufficient detail should be provided to allow for meaningful comparisons.

Responses to these comments are provided on a separate page following this comment document.

Minimize Potential Adverse Impacts and Mitigation – 40 CFR 230.10(d)

Comment No. 37-05

Pursuant to the Guidelines, mitigation of project impacts begins with the avoidance and minimization of direct, indirect, and cumulative impacts to the aquatic ecosystem, followed by compensatory measures if a loss of aquatic functions and/or acreage is unavoidable. Compensatory mitigation is, therefore, intended only for unavoidable impacts to waters after the LEDPA has been determined. For this reason, it would be premature to examine in detail any mitigation proposal before compliance with 40 CFR 230.10(a) is established.

The DEIS has not clearly demonstrated that all practicable measures to minimize unavoidable impacts to potential waters of the United States have been incorporated into the proposed project design. For example, the DEIS states that off-site flows originating within potentially jurisdictional waters will be managed by filling natural washes and rerouting surface flows through a system of concrete-lined channels around the perimeter of the project site (pg. 2-34). We believe there may be project designs that avoid and minimize direct, indirect, and cumulative impacts to potential jurisdictional washes by reducing the fill footprint, utilizing existing drainage channels, and if necessary, constructing drainage channels with more natural features, such as earthen berms. In addition, the DEIS provides no assessment of the cumulative

Comment No. 37-05 (continued)

impacts on waters of the United States of the proposed project and another 12 proposed energy-related projects in the area. Finally, the DEIS includes no compensatory mitigation measures for potential impacts to jurisdictional waters. In short, the project appears not to comply with EPA's Guidelines, nor with the Corps and EPA's regulations governing mitigation under Section 404 of the CWA.[2]

Recommendations:
Discuss the steps taken to avoid and minimize impacts to waters of the United States. To the extent any aquatic features that could be affected by the project are determined not to constitute waters of the United States, EPA recommends that the FEIS characterize the functions of such features and discuss potential mitigation.

Include in the FEIS a mitigation plan for unavoidable impacts to waters of the United States, as required by Corps and EPA regulations.

Responses to these comments are provided on a separate page following this comment document.

Ephemeral Washes and Drainage

Comment No. 37-06

EPA is concerned about the potential impact to the ephemeral water segments of Fortymile Wash located within the project area. The DEIS provides basic hydrologic information on the location of the proposed project, but does not include a detailed map of the water resources or hydrographic basins in the Amargosa Valley (pg. 3-29).

Recommendation:
Include a more detailed map of the water resources and hydrographic basins surrounding the proposed project, specifically Fortymile Wash.

Comment No. 37-07

Natural washes perform a diversity of hydrologic and biogeochemical functions that directly affect the integrity and functional condition of higher-order waters downstream. Healthy ephemeral waters with characteristic plant communities control rates of sediment deposition and dissipate the energy associated with flood flows. Ephemeral washes also provide habitat for breeding, shelter, foraging, and movement of wildlife. Many plant populations are dependent on these aquatic ecosystems and adapted to their unique conditions. The potential damage that could result from disturbance of flat-bottomed washes includes alterations to the hydrological functions that natural channels provide in arid ecosystems: adequate capacity for flood control, energy dissipation, and sediment movement, as well as impacts to valuable habitat for desert species.

Recommendation:
Include information on the functions and locations of ephemeral washes in the project area because of the important hydrologic and biogeochemical role these washes play in direct relationship to higher-order waters downstream.

Comment No. 37-08

The DEIS states that the section of Fortymile Wash that transverses the project area will be rechanneled and designed to intercept the 100-year storm event and convey the concentrated flow to historic discharge points at the southwest corner of the property. Flood protection of the

[2] Compensatory Mitigation for the Loss of Aquatic Resources, Final Rule, 33CFR 325 and 332, April 10, 2008.

Comment No. 37-08 (continued)

property from off-site flows will be provided by means of a continuous concrete-lined channel around the northern and western perimeter of the site. Four primary onsite channels will provide 100-year stormwater runoff interception; minor channels onsite within each section will be designed to intercept and convey the 25-year storm event. All primary channels are proposed to be concrete lined. Energy dissipation facilities will be provided in order to disperse the concentrated flow back to a shallow sheet flow condition prior to leaving the property boundary (pg. 2-34).

Recommendations:
Demonstrate that downstream flows will not be disrupted due to proposed changes to any natural washes nor the excavation of large amounts of sediment.

Include a functional assessment of the waters on the proposed project site and the change to the function of those waters as a result of the proposed project.

Discuss the feasibility of utilizing existing drainage channels on site. Discuss the feasibility of utilizing more natural features, such as earthen berms or channels, rather than concrete-lined channels.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 37-09

The DEIS does not provide detailed information about fencing (pg. 2-33) or the effects of fencing on drainage systems. In this region, storms can be sudden and severe, resulting in flash flooding. Fence design must address hydrologic criteria, as well as security performance criteria. The National Park Service recently published an article[3] on the effects of the international boundary pedestrian fence on drainage systems and infrastructure. We recommend that BLM review this article to ensure that such issues are adequately addressed.

Recommendation:
Provide more detailed information about fencing and potential effects of fencing on drainage systems within the FEIS. Ensure that the fencing proposed for this project will meet appropriate hydrologic performance standards.

Comment No. 37-10

The DEIS also states that a regional flood control alternative was presented to the BLM and Nye County staff. The alternative would provide a regional off-site detention basin at the apex of the Fortymile Wash that would effectively and considerably reduce existing condition peak storm flow. Reducing off-site peak flows impacting the site would allow for a reduction in size of perimeter flood control facilities. EPA contacted BLM to ascertain whether this was still being considered and was told that Nye County was unlikely to move forward with the stormwater detention basin.

Recommendation:
Provide an update on the status of the regional flood control alternative in the FEIS.

[3] National Park Service, August 2008, Effects of the International Boundary Pedestrian Fence in the Vicinity of Lukeville, Arizona, on Drainage Systems and Infrastructure, Organ Pipe Cactus National Monument, Arizona,

Comment No. 37-11

Clean Water Act Section 303(d)

Section 303(d) of the CWA requires each State to develop, every two years, a list of impaired waters that do not meet water quality standards; to establish priority rankings of such waters; and to develop Total Maximum Daily Loads (TMDLs) for the pollutants causing impairment. Based on Nevada's 2006 Section 303(d) list, there are no impaired waters in the project area. The Nevada Division of Environmental Protection and the EPA have agreed that Nevada need not develop a 2008 303(d) list, but can combine the 2008 and 2010 303(d) lists. A draft 2008–2010 303(d) Impaired Waters list should be available for review in Spring 2010.

Recommendation:
Utilize the 2008-2010 303(d) Impaired Waters list, if it is available, and update the information regarding impaired waters in the FEIS.

Responses to these comments are provided on a separate page following this comment document.

Groundwater Resources

Comment No. 37-12

Over Appropriation of Groundwater Resources

EPA is concerned about the over appropriation of groundwater within the Amargosa Valley and potential impacts associated with pumping groundwater in the basin. The project site is located in the Amargosa Desert Hydrographic Basin, a region that has already experienced rapid water level declines. Several springs of regional importance are located nearby in the Ash Meadows National Wildlife Refuge (NWR), including Devils Hole, a 40-acre detached unit of Death Valley National Park. Devils Hole provides habitat for the only naturally occurring population of the endangered Devils Hole Pupfish.

Water rights in the Amargosa Valley have been scrutinized for many years due to the proximity of environmentally sensitive areas at Devils Hole, Ash Meadows, and Death Valley. In the late 1960s/early 1970s, ranching and farming operations in the Ash Meadows area resulted in a decline in water levels in Devils Hole, which threatened the survival of the Devils Hole Pupfish (pg. 3-37). In 1973, the U.S. District Court[4] granted a preliminary injunction preventing pumping that would lower the pool below a certain datum. In 1978, the U.S. District Court issued a permanent injunction to limit pumping, and, by 1988, water levels had recovered to about 1 foot below the pre-pumping level. More recently, concerns were raised that the pool level would fall below the court mandated minimum level in the intermediate to long-term future. To further protect federally reserved[5] water rights at Devils Hole, the Nevada State Engineer issued Order 1197, ruling that conditions warranted the curtailment of future appropriations of underground water and additional regulation of change applications within portions of the Amargosa Desert Hydrographic Basin (November 4, 2008).

[4] Note: The District Court's decision was upheld by the Court of Appeals and the Supreme Court of the United States. See: *United States v. Cappaert*, 375 F. Supp. 456 (D. Nev. 1974); *Cappaert v. United States*, 426 U.S. 128, 141 (1976); *United States v. Cappaert*, 455 F. Supp. 81 (D. Nev. 1978).
[5] Since 1989, the U.S. Fish and Wildlife Service (USFWS) has acquired certified water rights for 19,250 afy to protect groundwater sources that feed the springs and seeps in the Ash Meadows National Wildlife Refuge, making it the largest water rights holder in the basin (pg. 3-37).

Comment No. 37-12 (continued)

As disclosed in the DEIS, the perennial yield of the Amargosa Valley Hydrographic Basin is estimated at 24,000 acre-feet per year (afy). Active annual duty (approved water use) is estimated at 25,260 afy; pending annual duty is estimated at 619 afy (table 3-7; pg. 3-39). Missing from the discussion in the DEIS, however, is the correlation between perennial yield and discharge from springs at Ash Meadows NWR. The 17,000 afy discharged by springs in Ash Meadows, which is used to satisfy the certificated rights of the U.S. Fish and Wildlife Service (USFWS) (pg. 3-37), is a component of perennial yield[6]. This results in a net imbalance between committed resources (25,260 afy + 17,000 afy) and perennial yield (24,000 afy), which should be disclosed and discussed more clearly within the DEIS.

Recommendation:
Discuss the apparent over appropriation of groundwater resources within the Amargosa Valley in the FEIS.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 37-13

Utilization of Groundwater Flow Model

Groundwater flow modeling was conducted using the Death Valley Regional Flow System (DVRFS) Model. As described in the DEIS, there are limitations associated with using a regional-scale groundwater model to evaluate potential water resource impacts at springs or other sites that are local in scale (pg. 3-43). The DEIS states, in fact, that it is not an appropriate use of the DVRFS Model to predict hydraulic heads or water-level change at Devils Hole, although the model may give a qualitative sense of how water levels change over time at a given location. Furthermore, the Groundwater Modeling Report states that all the model results presented here are not accurate to the feet scale, but several meters (GWMR; pg. 3). In the Biological Resources section the DEIS further states that, "*It is impossible to specifically measure Project effects on drawdown at Devils Hole, because of the limitations of the model design*" (pg. 4-37). In spite of these precautions, however, the DVRFS Model results are presented in the DEIS and are utilized to support the conclusion that an additional 400 afy of pumping reduces simulated water levels at Devils Hole by a minute amount, less than 0.6 of an inch after 200 years (pg. 4-18).

Recommendation:
Quantify the uncertainty associated with using the DVRFS Model to predict drawdown at specific points, such as Devils Hole. Discuss calibration standards used to calibrate the DVRFS Model, and compare them to the results. Consider revising summary and conclusions to reflect qualitative information rather than quantitative information.

Comment No. 37-14

Even more noteworthy, however, is the fact that the DVRFS results indicate that groundwater levels at Devils Hole are steadily declining and may reach critical levels in the near future. Simulated water levels in Devils Hole show a decline of over 13 feet after 200 years of pumping at current (2003) levels (pg. 4-18). By 2020, the water level is expected to reach a court mandated minimum water level needed to sustain the Devils Hole pupfish if 2003 pumping levels continue (pg. 4-37; pg. 4-42). According to the Groundwater Modeling Report, pumping in the basin would have to be reduced between 80 and 90% from 2003 levels to stabilize water

[6] Ruling 5750, Nevada State Engineer, July 16, 2007.

Comment No. 37-14 (continued)

levels at Devils Hole (Appendix B, pg. 6). This is important information; however, the DEIS focuses the discussion, instead, on the minute amount of groundwater decline associated with project-related pumping.

Recommendations:
Revise the summary to note that groundwater levels at Devils Hole are steadily declining and may reach critical levels in the near future. Discuss when the U.S. District Court mandated level will be reached using current pumping data. Illustrate this critical point on figures 6, 7, 8, and 9 (Appendix B). Address this issue with greater transparency within the FEIS, including in the Water Resources and Cumulative Impacts section.

Demonstrate whether there is sufficient groundwater for the lifetime of this project, considering current pumping levels in the basin.

Discuss whether existing water rights are likely to be curtailed in the event that pool levels at Devils Hole decline, leading to the imperilment of the Desert Pupfish. Discuss how the proponents would deal with this situation and the adaptability of the project to this scenario.

Consider whether it would be prudent and feasible to lease or purchase additional water rights to compensate for this possible scenario.

Comment No. 37-15

EPA recently learned that the U.S. Geological Survey (USGS) is currently working on a hydrologic study utilizing the Southern Amargosa Embedded Model (SAMM), a higher resolution embedded flow model. This study should provide additional information about the study area and be utilized as a more accurate tool for groundwater management in the Amargosa Valley.

Recommendations:
Describe the USGS SAMM hydrologic study and compare this to the DVRFS Model.

Include a discussion of the potential effect of future climate change on the proposed project and groundwater resources.

Cumulative Impacts Analysis

Comment No. 37-16

The BLM has received more than 220 ROW applications for utility-scale solar energy projects in California, Nevada, Arizona, New Mexico, Utah, and Colorado (pg. 4-105). The DEIS discusses the Solar Programmatic EIS (PEIS) but does not provide detailed information about this project since it is not yet complete. The 24 solar energy study areas identified in conjunction with the Solar PEIS encompass 670,000 acres, and that area could be used to generate nearly 100,000 MW of solar electricity. Seven solar energy study areas were identified in Nevada, including one in the Amargosa Valley (32,699 acres) located nearby. The DEIS lists 10 solar projects in close proximity to the proposed project, but does not include an estimate of annual water requirements associated with these projects (fig. 4-10; pgs. 4-110-111). Without

Responses to these comments are provided on a separate page following this comment document.

Comment No. 37-16 (continued)

this type of information, it is difficult to conduct a thorough cumulative impacts analysis. We also understand that the Department of Energy (DOE) is planning a large-scale solar demonstration project (1,000 MW) at the Nevada Test Site, in proximity to the proposed site. That project is not mentioned in the DEIS cumulative impacts analysis.

Recommendations:
Update the list of reasonably foreseeable projects to include the large-scale solar demonstration project at the Nevada Test site.

Discuss whether the proposed project might be better situated at one of the solar energy study areas or at another location nearby, including the Nevada Test Site.

Evaluate site conditions at locations with an existing ROW application. Determine whether the ROW applications are active and viable.

Comment No. 37-17

The DEIS presents a brief cumulative impacts analysis discussion but does not provide detailed information nor an in-depth analyses of potential impacts for any resource, including groundwater (pg. 4-103 to 4-119). Although the DEIS notes that there would be no net increase in groundwater pumping within the basin (due to Order 1197), it does not consider what will happen to groundwater levels if pumping continues at existing rates (2003 conditions); nor does it address what might happen if there is an incremental increase associated with pumping due to the influx of large-scale solar projects in the area.

The DEIS states that annual water requirements for each of the renewable energy projects is unknown, but the developer would need to either lease or purchase water currently being pumped under an existing certified water right (pg. 4-113). The DEIS concludes that since the water user can only pump up to the authorized duty of the water right, there would be no net increase in groundwater pumping within the basin. To the extent that the purchased or leased water rights are more fully utilized, however, actual pumping may increase and incremental declines in groundwater levels and spring discharge may occur. Due to the scarcity of water in the region, the large number of solar projects proposed nearby, and the ever-increasing demand for this commodity, EPA is concerned about the depletion of this resource in the Amargosa Valley, and the potential impact on aquatic and riparian communities, particularly in Devils Hole and Ash Meadows NWR.

Recommendations:
Discuss the DVRFS results indicating that groundwater levels in Devils Hole are steadily declining and may reach critical levels in the near future. Evaluate the indirect impacts associated with groundwater pumping in the Amargosa Valley using recent pumping rates. Utilize more recent pumping data than 2003, or explain why 2003 is a representative number.

Identify owners with existing water rights within a 25-mile radius of Devils Hole and illustrate this with a table and map. Evaluate the extent to which existing water rights are fully utilized. Evaluate the consequences (indirect and cumulative impacts) should the

Responses to these comments are provided on a separate page following this comment document.

Comment No. 37-17 (continued)

existing water rights become more fully utilized in the future. Consider that existing water rights are largely associated with irrigation where there is some return flow to the aquifer; solar energy projects will not provide that recharge.

Estimate the annual water use associated with the reasonably, foreseeable large-scale solar projects proposed in the Amargosa Valley. The BLM should be able to obtain this information, upon request, from proponents of viable projects.

Demonstrate whether there is sufficient groundwater for the lifetime of this project and other reasonably foreseeable projects in the study area, based on the additional information.

Address what measures would be taken, and by whom, should groundwater resources in the basin become overextended to the point that further curtailment is necessary due to, for example, additional growth, the influx of large-scale solar projects, drought, and the utilization of existing or pending water rights in the basin.

Describe mitigation and monitoring measures appropriate for groundwater resources.

Consider the indirect and cumulative impacts associated with multiple large-scale solar projects proposed in the desert southwest on various resources including: habitat, endangered species, groundwater, aquatic species, and air quality.

Responses to these comments are provided on a separate page following this comment document.

Comment No. 37-18

As an indirect result of providing additional power, it can be anticipated that this project will allow for development and population growth to occur in those areas that receive the generated electricity.

Recommendation:
The DEIS should describe the reasonably foreseeable future land use and associated impacts that will result from the additional power supply. The document should provide an estimate of the amount of growth, likely location, and the biological and environmental resources at risk.

Comment No. 37-19

Biological Resources and Habitat

The DEIS states that a Biological Assessment (BA) has been prepared for the proposed action and will be submitted to the U.S. Fish and Wildlife Service (USFWS) as required by Section 7 of the Endangered Species Act. Submission of the BA will initiate consultation with the USFWS. The DEIS states that the BA is being prepared for seven plant species (table 3-13) that may occur in the Project's Region of Influence (pg. 4-37) and for six wildlife species that may be affected by the implementation of the project (pg. 4-42). Long-term groundwater pumping could indirectly impact six of the seven plant species at Ash Meadows and six wildlife species. EPA believes the FEIS should include a more in-depth discussion of the project's potential impacts to biological resources, including the aquatic species in the Ash Meadows NWR.

Comment No. 37-19 (continued)

Recommendations:
The FEIS should include the outcome of consultation with the USFWS. Include a copy of the BA or Biological Opinion and/or concurrence received from USFWS in the FEIS.

Specify, in the FEIS, the measures that will be taken to protect important wildlife habitat areas from potential adverse effects of the proposed activities. Discuss any associated monitoring and mitigation.

Climate Change

Comment No. 37-20

The DEIS presents a brief discussion on climate change in Section 3.1.5 but does not include measures to avoid, minimize, or mitigate the effects of climate change on the proposed project (pg. 3-13). Scientific evidence supports the concern that continued increases in greenhouse gas emissions resulting from human activities will contribute to climate change. Effects on weather patterns, sea level, ocean acidification, chemical reaction rates, and precipitation rates can be expected.

Recommendations:
Consider how climate change could affect the proposed project, specifically within sensitive areas, and assess how the impacts of the proposed project could be exacerbated by climate change.

Identify strategies to more effectively monitor for climate change impacts in the surrounding area, such as monitoring groundwater change or special status species.

Quantify and disclose the anticipated climate change *benefits* of solar energy. We suggest quantifying the greenhouse gas emissions that would be produced by other types of electric generating facilities (solar, geothermal, natural gas, coal-burning, and nuclear) generating comparable amounts of electricity, and compiling and comparing these values.

Responses to these comments are provided on a separate page following this comment document.

Alternatives Analysis

CEQ Regulations for implementing NEPA (40 CFR, Parts 1500-1508) state that the alternatives section of an EIS should "rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly describe the reasons for their having been eliminated" (40 CFR, part 1502.14). As stated in our scoping comments, reasonable alternatives should include, but are not necessarily limited to, alternative sites, capacities, and technologies as well as alternatives that identify environmentally sensitive areas or areas with potential use conflicts. A robust range of alternatives will include more options for avoiding significant environmental impacts.

The DEIS presents only two action alternatives and a no-action alternative. Each of the alternatives includes two 232 MW parabolic trough solar power plants with a nitrate salt thermal storage system. The two alternatives are virtually identical except for the type of cooling

technology utilized. The Proposed Action includes dry-cooling technology and the other alternative uses wet-cooling technology. Water requirements for dry-cooling technology are approximately 400 afy, whereas, water requirements for wet-cooling technology would be approximately 4,600 afy.

These two alternatives provide a very limited range of options for decision makers to evaluate the proposed project, except within the context of water use. While we strongly support the decision to utilize dry-cooling rather than wet-cooling, we expect that it would have been difficult to obtain and utilize sufficient water rights for the wet-cooling option for the lifetime of the project, given the situation in the Amargosa Valley. From that standpoint, the wet-cooling option may not represent a viable alternative. In essence, what remains is a very limited range of alternatives (Proposed Action and a No-action Alternative), rather than a robust range of alternatives. In addition, we note that existing water rights are likely to be in ever-increasing demand in the future because of the large number of solar projects that have been proposed within the Amargosa Valley.

The DEIS states that three other alternative sites were considered, but were eliminated after further analysis. While the DEIS includes a very brief qualitative discussion (2-3 sentences) on the reasons for eliminating alternatives, it provides no detailed information on these three sites. The DEIS also states that the proponent considered the alternative of developing the proposed project as a single 232 MW plant, but the development of a smaller project was rejected given the infrastructure requirements associated with building a single 232 MW plant and the economies of scale. The DEIS notes, however, that building one plant would have fewer environmental impacts (pg. 2-4).

Comment No. 37-21

Since the proponent has been unable to identify any other site suitable for further consideration, we recommend that the FEIS analyze an on-site alternative with a reduced footprint. Defining another alternative within the project area would enable decision makers to evaluate the proposed project using a wider range of variables.

Recommendations:
Include maps of the three alternative sites and a more detailed discussion regarding the reasons for elimination. Quantify potential impacts to the greatest extent practicable.

Consider, analyze, and present an on-site alternative with a reduced footprint and lesser environmental impacts. Discuss how the project was reduced down to 4,350 acres and provide an illustration of the original ROW application.

Discuss whether another technology might be more suitable for this particular site, such as photovoltaic or dish systems. These technologies use less water than parabolic trough systems, which is an important factor, considering the shortage of groundwater in the Amargosa Valley. In addition, there is greater flexibility associated with the layout of components, which could result in avoidance and minimization of impacts to Fortymile Wash.

A response to this comment is provided on a separate page following this comment document.

Comment No. 37-22

EPA has worked closely with the DOE's National Renewable Energy Laboratory (NREL) to develop maps[7] showing contaminated lands and mining sites with renewable energy generation potential. These maps were developed in conjunction with the *RE-Powering America's Land: Renewable Energy on Contaminated Land and Mining Sites* program,[8] which was launched by the EPA Office of Solid Waste and Emergency Response (OSWER) in September 2008. Under this initiative, EPA is taking a multi-pronged approach[9] to encouraging reuse of EPA-tracked lands[10] into clean and renewable energy production facilities. EPA has developed a Renewable Energy Interactive Mapping Tool[11] that utilizes Google Earth to display these sites. We estimate that there are approximately 480,000 disturbed and contaminated sites and almost 15 million acres of potentially contaminated properties across the United States. Many of the contaminated properties are suitable for renewable energy development and have existing transmission capacity and infrastructure in place, as well as adequate zoning.

Recommendations:
Describe the current condition of the land selected for the proposed project, discuss whether the land is classified as disturbed, and describe to what extent the land could be used for other purposes.

Utilize the Renewable Energy Interactive Mapping Tool to explore whether there are disturbed sites located in proximity to the proposed project and discuss this in the FEIS. Consider the Nevada Test Site as well.

Responses to these comments are provided on a separate page following this comment document.

Purpose and Need

Comment No. 37-23

EPA believes the discussion in the DEIS regarding the purpose and need for the proposed Project should be expanded to include more robust information regarding the *need* for the proposed project. As indicated in our scoping comments (August 6, 2009), the DEIS should discuss the proposed project in the context of the larger energy market that this project would serve; identify potential purchasers of the power produced; and discuss how the project will assist the state in meeting its renewable energy portfolio standards and goals. Strengthening the discussion on these topics will improve the readability of the document and may also provide further justification for the project.

[7] To develop the maps, EPA and NREL collected renewable energy resource information and merged it with EPA and state data on contaminated lands and mining sites across the country. The mapping analysis applied basic screening criteria, such as distance to electric transmission lines, distance to roads, renewable energy potential, and site acreage in order to identify EPA tracked lands that might be good candidates for solar, wind, or biomass energy production facilities.
[8] For additional information on EPA's RE-Powering America's Land, please use the following weblink: http://www.epa.gov/renewableenergyland/index.htm
[9] See Internet site: http://www.epa.gov/renewableenergyland/docs/repower_contaminated_land_factsheet.pdf
[10] EPA tracks abandoned mine lands, Brownfields, Resource Conservation and Recovery Act (RCRA) sites, Federal Superfund Sites, and Non-Federal Superfund Sites.
[11] See Internet site: http://www.epa.gov/renewableenergyland/mapping_tool.htm. Open the Renewable Energy Interactive Map (KMZ) to launch the Renewable Energy Mapping Tool. More detailed information on the EPA tracked sites is available at: http://epa.gov/renewableenergyland/maps/ocpa_renewable_energy_data.xls.

Comment No. 37-23 (continued)

The DEIS presents purpose and needs statements for two federal agencies: BLM (pg. 1-3) and the DOE (pg. 1-4). The BLM's purpose and need for the proposed project is to respond to the application for a ROW grant to construct, operate and decommission a solar thermal generation facility and associated infrastructure. The DOE's purpose and need would be to comply with its mandate under the Energy Policy Act (EPAct) to select eligible projects that meet the goals of the EPAct, and is contingent upon the decision to enter into negotiation of a loan guarantee. In addition, the DEIS presents the proponent's objectives and purpose for the proposed project (pg. 1-8).

Within the introduction, the DEIS cites Executive Order 13212 and Section 211 of the Energy Policy Act (EPAct). Executive Order 13212 orders executive departments and agencies to take appropriate actions to expedite projects that will increase the production, transmission, or conservation of energy. Section 211 of the EPAct calls for the Secretary of the Interior to seek to have at least 10,000 MW of approved renewable energy projects located on public lands by 2015. The DEIS states that Nevada utilities will need in excess of 3,000 gigawatt hours per year (GWh/yr) of new renewable energy generation capability over the next 10 years to meet the State's renewable energy needs, and cites the Nevada Renewable Energy and Energy Conservation Task Force 2005 Annual Report. In the same paragraph, the DEIS states that at least 1,000 MW of new solar power will be required annually to meet this need (pg. 1-1).

EPA reviewed the 2005 Annual Report but did not locate a citation for 3,000 GWh/yr nor 1,000 MW. The 2005 Annual Report summarizes results from a 2004 workshop on how to improve the Nevada Renewable Portfolio Standard (RPS). At that time, utilities were having difficulty complying with the 2003 RPS and anticipated having difficulty complying with the 2004 and 2005 RPS. Since 2004, the energy sector has changed dramatically. In the last three years, there has been tremendous growth in renewable energy, and decline in the more traditional sectors, including the postponement/indefinite delay/modification of three large coal-fired power plants. Many factors have triggered this shift, including concerns about global warming and climate change. These events have spawned an unprecedented increase in the number of applications submitted to BLM for large-scale renewable energy projects on public lands in the desert southwest. BLM has received over 470 renewable energy project applications, to date, with a projected capacity of 97,000 MW of electricity[12].

We would urge BLM to revise this section of the DEIS and utilize more robust and up-to-date estimates on the *need* for renewable energy within Nevada in the Final Environmental Impact Statement (FEIS). As a starting point, we suggest that BLM examine Governor Jim Gibbons' Nevada Renewable Energy Transmission Access Advisory Committee (RETAAC) Phase II Report (July 2009). Other sources of information include the Nevada Public Utilities Commission (NPUC) and U.S. Energy Information Administration, as well as annual reports on Portfolio Standard Compliance and the Status of Energy in Nevada.

A response to this comment is provided on a separate page following this comment document.

[12] "Secretary Salazar, Senator Reid Announce 'Fast-Track' Initiatives for Solar Energy Development on Western Lands", U.S. Department of Interior, News Release, June 29, 2009. http://www.blm.gov/wo/st/en/info/newsroom/2009/june/NR_0629_2009.html

Comment No. 37-23 (continued)

Recommendation:
Update the discussion regarding the *need* for the proposed project, utilizing more accurate, robust, and up-to-date references.

Comment No. 37-24

The RETTAC Phase II Report recognizes that there is great potential for renewable energy development within Nevada and provides estimates of this potential. The report also recognizes that there is a market for renewable energy not only in Nevada, but also in surrounding states, particularly California. We note that the DEIS does not identify a specific purchaser for the power generated. In light of these facts, we recommend that the FEIS expand the introduction to include a discussion of how renewable energy generated in Nevada might also be utilized to satisfy renewable portfolio standards of nearby states, in particular California.

Recommendation:
Identify potential purchasers of the power produced and discuss how the project will assist Nevada, and/or California, in meeting its RPS goals.

Comment No. 37-25

The DEIS includes a list of the Proponent's objectives and purpose of the proposed Project (pg. 1-8). We are pleased to see a wide range of objectives, with no specific objective (such as MW generated) used to preclude a specific alternative. According to these objectives, the 464 MW facility will contribute approximately 1,000,000 MW hours of clean, renewable solar energy per year to meet renewable energy goals. This terminology can confuse the reader if one is not careful. Many people don't realize that "*GWhr/yr*" provides a measure of the actual output of the plant; whereas "*megawatts*" provides a measure of how much a solar power plant is able to generate instantaneously. The ratio of these two values is deemed the net capacity factor. Solar energy projects typically have a capacity factor that is much lower than baseload systems (coal, natural gas, geothermal). The RETAAC report, for example, assumes a capacity factor of 30% for solar projects. Based on the information presented in the DEIS, the capacity factor for this project is assumed to be about 24.6% (1,000,000 / (464*24*365.25)*100). Power purchase agreements (PPA) between the power plant owner and the electric utility contain the expected annual output of the plant (in GWh/yr) and the price to be paid for each MWh produced. For the proposed project, we might expect to see a PPA signed for 139 MW (464 * 0.3), for example, rather than 464 MW.

Recommendation:
Expand the introduction to include a discussion of RPSs, PPAs, and capacity factors and how this is relevant to intermittent energy sources such as solar energy.

Responses to these comments are provided on a separate page following this comment document.

Hazardous Materials/Hazardous Waste/Solid Waste

Comment No. 37-26

The DEIS states that approximately 8,300 tons of heat transfer fluid (HTF) will be utilized in the parabolic trough heat transfer system (pg. 4-98). The HTF (Therminol) is not listed as a hazardous material, but may be considered hazardous waste as that term is defined by RCRA, 40 CFR 261.24, due to its toxicity characteristic. The HTF can be heated up to 752 degrees Fahrenheit and circulates in a closed loop system that is monitored continuously for pressure. The DEIS states that this material at high temperatures can present a fire hazard (pg. 4-

Comment No. 37-26 (continued)

99), but does not elaborate on the risks. A literature search reveals that concerns have been expressed regarding the compatibility of Therminol and molten salt and the subsequent reaction that would occur due to a failure in the oil-to-salt heat exchanger. Because the proposed project would be located in close proximity to residential housing and schools, EPA recommends that the FEIS discuss this topic in greater detail.

Recommendation:
EPA recommends that the FEIS provide additional information on solar energy fire hazards, particularly those associated with the compatibility of HTF and nitrate salt thermal energy storage systems.

Responses to these comments are provided on a separate page following this comment document.

Miscellaneous Edit

Comment No. 37-27

1. Page 4-42, Ash Meadows NWR Species – Text states that there are five fish that inhabit the Ash Meadows NWR within the Project's ROI, but lists only four fish.

RESPONSES TO COMMENT NO. 37-01 THROUGH 37-27

Response to Comment No. 37-01

See response to comment 22-07.

Response to Comment No. 37-02

See response to comment 22-07.

Response to Comment No. 37-03

See response to comment 22-07.

Response to Comment No. 37-04

The alternatives considered in this EIS are described in Chapter 2. The Proponent is working with the U.S. Army Corps of Engineers to obtain the required permits under the Clean Water Act. The USACE compliance requirements are a separate action from the BLM's right-of-way permitting process. The BLM must make a decision whether to approve, approve with modification, or deny issuance of the right-of- way grant requested in the application. The BLM's purpose and need is to process the right-of-way application in accordance with FLPMA, BLM right-of-way regulations, and other applicable federal laws. The BLM recognizes there are other BLM managed land that could produce renewable energy. However, for this EIS, BLM's purpose and need is to process a specific application. Should BLM decide to deny the right-of-way, the Proponent can pursue any other energy development methods, technology, and locations that the Proponent desires, including applying for a different BLM land parcel.

Response to Comment No. 37-05

See response to comment 22-07.

Response to Comment No. 37-06

A map showing the Amargosa Desert Hydrographic Basin and surrounding basins has been added to the FEIS.

Response to Comment No. 37-07

See Section 3.4.3.1 – Surface Water Features. The FEIS includes a description of ephemeral washes in the project area, including Fortymile Wash, which is tributary to the Amargosa River. Drainages that traverse the project area are not considered to be prominently linked with downstream ecosystems, including the Amargosa River, because of the ephemeral nature of flows of xeroriparian drainages in the project vicinity. The sparse vegetation in the project vicinity provides little detrital material to support a significant carbon resource for downstream ecosystems. Biological and ecological values on the site are typical of valleys in the Mojave Desert. Plants and wildlife are highly adapted to this low-water, high-temperature environment. The suite of plants and wildlife present on the site are all xeric-adapted upland species, and species diversity is primarily limited by availability of water resources. In contrast, downstream areas of the Amargosa River contain perennial waters that support greater species diversity and higher densities of both plants and wildlife. However, the xeric-adapted wildlife species present on the Project site are self-sufficient, remote from, and independent of the Amargosa River. They are unlikely to use or colonize habitats within or adjacent to perennial surface waters of the Amargosa River as suitable habitats in these areas are likely already occupied. The Project site does not support any of the aquatic-dependent plant or wildlife species found downstream in the Amargosa River.See also response to comment 22-07.

Response to Comment No. 37-08

The Conceptual Stormwater Control Plan in Appendix E of the DEIS and FEIS describes how stormwater control features will be incorporated into the project design. A conceptual level of evaluation is what is required by the BLM at this stage of planning. Due to the ephemeral nature of drainages that traverse the project site, and low amount of precipitation in the regional area (averaging 3.9 inches per year), it is highly unlikely that rechanneling of these washes will affect downstream flows. The Conceptual Stormwater Control Plan provides analysis for the project site as well as the entire contributing basin of the Forty Mile Wash (approximately 330 square miles) impacting the project site. Perimeter flood control facilities proposed for the project have been conceptually designed to intercept, convey and discharge the computed 100-year storm event flow rate of approximately 9,600 cfs generated by the Fortymile Wash watershed. The proposed stormwater facilities will be designed to stabilize releases of intercepted storm flows to historic locations in both quantity and manner. A complete functional assessment of these washes will be conducted as part of the USACE Section 404 permit process.

Response to Comment No. 37-09

The current fencing plan includes the perimeter flood control facilities inside a tortoise fence, security fence and wind fence. The fencing will be designed to allow for the passage of storm flows and minimization of debris capture.

Response to Comment No. 37-10

A coordinated regional flood plain approach for the area was pursued jointly with BLM, Nye County and adjacent solar company right-of-way applicants. All parties agreed to the positive pursuit of the approach, however coordinated funding, schedule variations and design responsibility for such a facility was determined to be an overwhelming challenge at this point in time. Therefore the alternative of providing a regional detention basin north of US 95 is an unlikely venture and the project is proposing independent flood protection.

Response to Comment No. 37-11

Based on review of the latest 303(d) list from NDEP (2006) there are no 303(d) waters in or near the Project area.

Response to Comment No. 37-12

As part of the water appropriation permit application review and authorization, the Nevada State Engineer has the authority to approve and control the amount of groundwater pumped from basins in Nevada. The Nevada State Engineer will determine what measures would be taken should a basin become overextended due to additional growth, drought conditions, or uses by existing or pending water right holders in the basin.

Response to Comment No. 37-13

Uncertainty in the DVRFS model is discussed in the DVRFS model report provided in Appendix B. Calibration standards are also discussed in the same report. The reader is referred to this report if they want more information on the DVRFS model. The summary and conclusions will be revised to reflect the model as a quantitative tool.

Response to Comment No. 37-14

See response to comment 34-21. Given the qualitative nature of the DVRFS model results and the uncertainty in the groundwater withdrawal amounts in the Amargosa Desert, the exact timing of when water levels at Devils Hole will fall below the Court mandated level will not be presented in the EIS. However, a sentence will be added in Appendix B stating "It is likely water levels at Devils Hole will fall below the U.S. District mandated level, but as stated in the last sentence the timing cannot be quantified at this time." Similar language will be inserted in the Water Resources and Cumulative Impacts sections.

Yes, there is sufficient groundwater for the Project duration. There are several 100 feet of saturated thickness in the basin fill deposits available beneath the project site for use. See also responses to comments 05-01 and 24-02.

Response to Comment No. 37-15

The SAMM study being conducted by the USGS commenced this calendar year and will not be completed until 2013. The embedded model within the DVRFS model will have revised geology, be calibrated through at least 2003 instead of 1998, and finer horizontal grid spacing (500 m x 500 m) in the Amargosa Desert area instead of 1500m x 1500 m and unknown finer vertical grid discretization. The SAMM model will produce more accurate results, but it will still be a regional scale model. A horizontal grid spacing of 500m x 500m is still too coarse to accurately evaluate groundwater conditions at a location like Devils Hole with complex geology.

Given the limited duration of the Project (30 years) there will not be significant climatic change to consider. There could be drought years, but given the fact it takes 10-70 years for recharge to reach the water table at the Project site according to Stonestrom et al. (2003), there is enough groundwater to sustain the Project.

Response to Comment No. 37-16

An updated list of reasonably foreseeable projects has been provided in the FEIS.

Response to Comment No. 37-17

See responses to Comments 34-21 and 37-14. The 2003 pumping rates were used because that was the most recent information compiled by the USGS (Moreo and Justet, 2008). Given the fact that a large majority of wells in the Amargosa Valley are not metered, using more recent pumping data would introduce even more uncertainty.

It is beyond the scope of this EIS to identify all water rights holders within 25-miles of Devils Hole. This area is subject to Order 1197 which includes restrictions on water use within a 25-mile radius of Devils Hole. It is the responsibility of the Nevada State Engineer to approve and control the amount of groundwater pumped from basins in Nevada. The Nevada State Engineer will determine what measures would be taken should a basin become overextended due to additional growth, drought conditions, or uses by existing or pending water right holders in the basin.

To address uncertainties associated with groundwater use for project construction and operation, Solar Millennium has agreed to acquire and forego the use of no less than 236afy of existing water rights within the Amargosa Desert Hydrographic Basin (No. 230). This will result in a net reduction in water use in the Amargosa Desert Hydrographic Basin over the Project's expected 30-year lifetime (see responses to comments 05-01 and 24-02. Details regarding specific mitigation measures are provided in Appendix A of the FEIS.

Response to Comment No. 37-18

Future land use as a result of the construction and operation of this project is addressed in section 4.11.1.2 in both the DEIS and FEIS. Transmission of power from the proposed Project will be "wheeled" through Valley Electric Association (Valley Electric).Valley Electric Association is currently reviewing Solar Millennium's application for interconnection. System studies are being conducted to identify what system improvements will be required as a result of this proposed interconnection. Valley Electric will make a separate right of way application and prepare the associated NEPA review as required to accommodate any facility improvements identified as a part of the interconnection study.

Response to Comment No. 37-19

The BLM is currently in Section 7 Consultation with the USFWS. A Biological Assessment has been submitted and will be made available with a Biological Opinion when the inter-agency consultation is complete.

Response to Comment No. 37-20

General statements about the expected changes in Great Basin due to climate change can be found in section 3.1.5, at this time extraordinarily large assumptions would have to be made to consider how climate change could affect the proposed project, or how the impacts of the proposed project could be exacerbated by climate change. It is outside the scope of this EIS to conduct such a study.

Monitoring climate change impacts of the surrounding area would not be associated with a project of this type, this EIS was developed to look specifically at the impacts associated with the development of a solar facility on the site, not to address climate change in the area. Quantifying and disclosing the anticipated climate change benefits of solar energy is outside the scope of this EIS.

Response to Comment No. 37-21

The level of detail provided in Chapter 2 regarding alternatives considered, but eliminated from further analysis is sufficient. Figure ES-2 and 1-2 shows lands originally requested in the ROW application but subsequently released from consideration. Reasons why alternative technologies were not considered is described in Section ES-1.4.4.2 and 2.2.1.2 (Alternative Solar Technology).

Response to Comment No. 37-22

Chapter 3 describes baseline conditions in the project area. The BLM must make a decision whether to approve, approve with modification, or deny issuance of the right-of- way grant requested in the application. The BLM's purpose and need is to process the right-of-way application in accordance with FLPMA, BLM right-of-way regulations, and other applicable federal laws. The BLM

recognizes there are other BLM managed land that could produce renewable energy. However, for this EIS, BLM's purpose and need is to process a specific application. Should BLM decide to deny the right-of-way, the Proponent can pursue any other energy development methods, technology, and locations that the Proponent desires, including applying for a different BLM land parcel.

Response to Comment No. 37-23

The section has been revised to include more up-to-date references.

Response to Comment No. 37-24

The EIS provides a general discussion of the reason and need for renewable energy; however, it is beyond the scope of this EIS to provide in-depth discussion of RPSs, PPAs and capacity factors. In any event, the FEIS has been updated to provide more information about potential offtakers, including those in California, and the need for renewable energy.

Response to Comment No. 37-25

The EIS provides a full discussion of the reason and need for renewable energy and the characteristics of the proposed Project, including power output.

Response to Comment No. 37-26

According to a 2001 report published by Sandia National Laboratories, the principal reactions between nitrate salt and Therminol were between the vaporized hydrocarbons and the air above the salt bath and not with the salt itself. In section 2.3.3.2, a description of how the HTF vapors will be handled, and a description of leak detection protocols can be found. Also, according to the same report "The safety concerns in a plant that uses Therminol and nitrate salt in a heat exchanger are not anymore dangerous than using Therminol around other high temperature heat sources. Accidentally mixing the two components should not create combustion, but combining hot Therminol vapors with oxygen from the air is dangerous. The design of the thermal storage system should address the unlikely event of having hot oil vapors released into the ullage space of a nitrate salt tank where oxygen could be present."

The salt storage tanks will be designed and operated with a nitrogen blanket with a slight positive pressure at all times. There will not be an oxygen environment that might support a fire or explosion in the rare event that small amounts of HTF leak into the tank. An HTF vapor sniffing sensor will be incorporated in the equipment that can encounter a breach between HTF and molten salt. This detection system will trigger immediate isolation of the equipment in addition to nitrogen blanketing, followed by the HTF evacuation from equipment suspected of a breach.

Response to Comment No. 37-27

In response to comment, the text has been updated in the Final EIS.

10-03010

Public Utilities Commission of Nevada

Electronic Filing

Submitted: 12/6/2010 3:27:25 PM

Reference: f4566245-8936-4100-a528-3fe0579a6181

Filed For: Amargosa Valley Solar I LLC

In accordance with NRS Chapter 719,
this filing has been electronically signed and filed
by: /s Diana L Wheelen

By electronically filing the document(s),
the filer attests to the authenticity of the electronic signature(s) contained therein.

This filing has been electronically filed and deemed to be signed by an authorized agent or representative of the signer(s) and
Amargosa Valley Solar I LLC

FILED WITH THE PUBLIC UTILITIES COMMISSION OF NEVADA - 12/6/2010

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December 6, 2010

ELECTRONIC FILING

Donna Skau, Commission Secretary
PUBLIC UTILITIES COMMISSION OF NEVADA
1150 E. William Street
Carson City, Nevada 89701

Re: **DOCKET NO. 10-03010**; APPLICATION OF AMARGOSA VALLEY SOLAR I, LLC FOR AUTHORITY UNDER THE PROVISIONS OF THE UTILITY ENVIRONMENTAL PROTECTION ACT FOR A PERMIT TO CONSTRUCT THE AMARGOSA SOLAR POWER PROJECT CONSISTING OF A 536 MW SOLAR THERMAL PLANT, RELATED ELECTRIC AND WATER TRANSMISSION FACILITIES, WASTEWATER SEPTIC SYSTEM, AND ASSOCIATED FACILITIES TO BE LOCATED APPROXIMATELY 80 MILES NORTHWEST OF LAS VEGAS IN NYE COUNTY, NEVADA.

Dear Donna:

Accompanying this letter, for filing with the Public Utilities Commission of Nevada (the "Commission") in Docket No. 10-03010 is Amargosa Valley Solar I, LLC's Notice of Filing of Record of Decision. Should you have any questions, or require additional information, please advise.

Sincerely,

Dan R. Reaser

Dan R. Reaser, Esq.
Douglas A. Cannon, Esq.

DRR:dlw
Enclosure

cc: Parties of Record

PUBLIC UTILITIES COMMISSION OF NEVADA

IN THE MATTER OF:

Application of Amargosa Valley Solar I, LLC for authority under the provisions of the Utility Environmental Protection Act for a permit to construct the Amargosa Solar Power Project consisting of a 536 MW solar thermal plant, related electric and water transmission facilities, wastewater septic system, and associated facilities to be located approximately 80 miles northwest of Las Vegas in Nye County, Nevada.	**Docket No. 10-03010**

NOTICE OF FILING OF RECORD OF DECISION

The Applicant, Amargosa Valley Solar I, LLC (the "Applicant" or "Company"), acting by and through its legal counsel, Lionel Sawyer & Collins, respectfully submits to the Public Utilities Commission of Nevada (the "Commission"), notice of the record of decision ("ROD") filed by the U.S. Department of the Interior, Bureau of Land Management, approving the construction, operation, maintenance and decommission of the proposed project by the Applicant. A copy of the ROD is attached hereto as **Exhibit 1**.

DATED and respectfully submitted this 6th day of December, 2010.

LIONEL SAWYER & COLLINS

By: Dan R. Reaser

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EXHIBIT 1

EXHIBIT 1

U.S. Department of the Interior
Bureau of Land Management

Record of Decision
November 2010

Amargosa Farm Road Solar Energy Project

APPLICANT

Solar Millennium, LLC
1625 Shattuck Ave, Suite 270,
Berkeley, CA 94709

GENERAL LOCATION

The proposed action is located on public lands managed by the Bureau of Land Management in Nye County, Nevada, five miles south of U. S. Highway 95, five miles west of State Route 373, north of Amargosa Farm Road, and east of Valley View Boulevard, Amargosa Valley, Nye County, Nevada.

BLM CASE FILE SERIAL NUMBER

N-84359

PREPARING OFFICE

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NATIONAL SYSTEM OF PUBLIC LANDS

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Appendices:

Appendix A. **Right of Way Grant**
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Appendix C. **Biological Opinion**
Appendix D. **Stipulated Agreement**

I. Introduction

This Record of Decision (ROD) approves the construction, operation, maintenance, and decommission of the proposed 500-MW Amargosa Farm Road Solar Energy Project on approximately 6,320 acres of BLM-administered lands. The proposed project and alternatives were analyzed in the *Final Environmental Impact Statement for the Solar Millennium, Amargosa Farm Road Solar Power Project, Nye County, NV* noticed in the *Federal Register* on October 15, 2010, (75 FR 63503).

1. Background

Solar Millennium, LLC submitted a right-of-way (ROW) application for the Amargosa Farm Road Solar Energy Project (N-84359) on November 20, 2007 for the authorization of two 250 megawatt (MW) parabolic trough solar thermal power plant facilities to generate 500-MW alternating current power on public lands administered by the Bureau of Land Management (BLM). The project site is located on public lands approximately five miles south of Highway 95, five miles west of State Route 373, north of Amargosa Farm Road, and east of Valley View Boulevard, Amargosa Valley, and Nye County, Nevada.

The BLM has prepared an environmental impact statement (EIS) in compliance with the National Environmental Policy Act (NEPA) of 1969 in response to the ROW application.

Title V of the Federal Land Policy and Management Act (FLPMA), 43 U.S.C. 1761-1771, authorizes the BLM, acting on behalf of the Secretary of the Interior to issue a ROW grant on, over, under, and through the public lands system for generation, transmission, and distribution of electric energy. The BLM's implementation of its statutory direction for ROW authorizations is detailed in 43 CFR Part 2800.

The Authorized Officer administers the ROW authorization and ensures compliance with the terms and conditions of the ROW lease/grant. The term "Authorized Officer" means any employee of the Department of the Interior to whom has been delegated the authority to perform the duties described in 43 CFR Part 2800. In respect to this specific ROW authorization, this authority has been delegated to the BLM's Southern Nevada District Manager.

2. Decisions to be made

The NEPA analysis contained in the Amargosa Farm Road Solar Energy Project EIS considered the following decisions to be made:

- Approve the Proposed Action or Alternative, with or without modifications, and grant a ROW lease/grant to the Applicant;
- Approve the Proposed Action or Alternative, with or without modifications, with additional mitigation measures and grant a ROW lease/grant to the Applicant; or

- Deny the ROW application to construct, operate and decommission a 500-MW solar thermal generation facility and associated infrastructure.

II. Mitigation and Monitoring

1. Required Mitigation

Mitigation measures required for the implementation of the approved action are included as a requirement of the ROW lease/grant (Appendix A of this ROD). The ROW lease/grant stipulations are included in Appendix B to this ROD. These stipulations will be strictly adhered to throughout the duration of all project activities and are essential elements of the project. Application of these stipulations will reduce the impacts to BLM-administered lands and resources as described in the Final EIS and this ROD. One stipulation of the ROW grant/lease requires Solar Millennium to acquire no less than 236 acre-feet/year of existing water rights (referred to as Minimization Water Rights – MWR) from within Basin No. 230 (Amargosa Desert Hydrographic Basin). This requirement is included in Stipulation #51 of the ROW lease/grant stipulations that further clarifies the use and disposition of the MWR as described on pages 15 and 16 of Appendix A in the Final EIS.

2. Monitoring, Mitigation, and Enforcement

The ROW authorization provides the BLM with the legal authority to enforce compliance with all stipulations required in this ROD, including the terms and conditions of the Biological Opinion issued by the U.S. Fish and Wildlife Service. Monitoring will occur throughout the duration of the project for each component of construction, operation, maintenance and decommissioning of the solar facility.

III. Alternatives Including The Proposed Action

Three alternatives were analyzed in the FEIS.

Alternative 1: No Action. The No Action Alternative assumes the ROW application would be denied and the proposed project would not be built.

Alternative 2: Proposed Action (Dry-Cooled). This is the environmentally preferable alternative. Alternative 2 analyzes the construction, operation, maintenance and decommissioning of a solar facility utilizing parabolic trough solar thermal technology and dry-cooled power plants. The project would be constructed in two separate phases on approximately 6,320 acres of public land in the project area and would generate approximately 500-MW of power. Phase 1 of the project is proposed to generate 250-MW and average net output of approximately 232-MW. Phase 2 will generate 250-MW and average net output of approximately 232-MW. Each phase will consist of power blocks, a solar field, a heat transfer fluid and steam generation system, a nitrate salt thermal storage system, conventional water treatment, electrical switchgear, administration, warehouse, and maintenance facilities.

The project facility would disturb approximately 4,350 acres of the 6,320 acre project area and would include solar fields, power blocks, office buildings, maintenance building, parking area, lay down area, storm water detention basin, evaporation ponds, switch yard, and a realignment of Amargosa Farm Road.

Alternative 3: Wet-Cooled Alternative. Alternative 3 analyzes the construction, operation, maintenance and decommissioning of a solar facility utilizing parabolic trough solar thermal technology using wet-cooled technology. The Project would consist of two wet-cooled solar power plants, each with a nameplate capacity of 250-MW and a net output of approximately 242-MW. Each solar plant would be equipped with thermal storage capability and associated linear facilities. Construction and operation of a wet-cooled project would be similar to the dry-cooled plant analyzed in Alternative 2. Plant components and layout are similar under both the wet- and dry-cooled alternatives; the primary differences are the amount of water used for plant operations, the need for cooling towers for heat rejection from the steam cycle for the wet-cooled alternative, and the area needed for the evaporation ponds.

In accordance with 40 CFR §1502.14, and consistent with guidance in BLM's NEPA Handbook, additional alternatives were considered but not carried forward for detailed analysis. The other alternatives included alternative sites and alternative solar technologies as described in the Final EIS.

IV. Management Considerations

The BLM's purpose and need for action is to respond to Solar Millennium's application under Title V of FLPMA for a ROW lease/grant to construct, operate, and decommission a solar generation facility and associated infrastructure in compliance with the FLPMA, BLM ROW regulations (43 CFR Part 2800), and other applicable Federal laws. Instruction Memorandum 2011-003, "Solar Energy Development Policy," dated October 7, 2010, establishes BLM policy to ensure the timely and efficient processing of energy ROWs for solar power on the public lands.

The decision to approve the Solar Millennium, LLC facility takes into account the BLM's purpose and need, statutory, and regulatory requirements, and national policy considerations, as well as Solar Millennium's technical and financial capability to construct the project for which the ROW is requested. The decision was also based on input provided by the public, industry, as well as other Federal and state agencies, including state public utility agencies. Through this review process, all practicable methods to reduce environmental harm have been incorporated into the decision. The decision is consistent with BLM's multiple use mandate under FLPMA.

Secretarial Order 3283 "Enhancing Renewable Energy Development on the Public lands," was signed January 16, 2009. This Secretarial Order established renewable energy as a Departmental policy and committed the U.S. Department of the Interior (DOI) to achieve the goals established in Section 211 of the Energy Policy Act of 2005.

The Energy Policy Act encourages the development of renewable energy resources, including solar energy. Section 211 of the Act encourages the Secretary of the Interior to approve at least 10,000-MW of non-hydropower renewable energy projects on public lands by 2015. Secretarial Order 3285 "Renewable Energy Development by the Department of Interior," signed March 11, 2009, as amended on February 22, 2010, establishes the development of renewable energy as a priority for the DOI and creates a Departmental Task Force on Energy and Climate Change. The Congress, and the President, through the DOI, has established a national policy priority for renewable energy development.

The State of Nevada has also enacted legislation requiring area utility companies to provide energy from renewable energy sources as part of the State's renewable portfolio standard to achieve a goal of 25 percent of its energy production from renewable energy sources by the year 2025.

1. **Relationship to BLM and other Agency Plans, Programs, Statutory Requirements and Policies**

Endangered Species Act. The U.S. Fish and Wildlife Service (FWS) has provided formal consultation for the desert tortoise on this project, and informal consultation for the 12 species found at Devils Hole and Ash Meadows, pursuant to Section 7 of the Endangered Species Act. The FWS issued a biological opinion for the project on November 1, 2010 and is attached to this ROD as Appendix C. The ROW authorization provides BLM with the legal authority to enforce compliance with the Biological Opinion throughout the duration of the project.

National Historic Preservation Act. The State Historic Preservation Office (SHPO) has reviewed this project under Section 106 of the National Historic Preservation Act. The SHPO reviewed and concurred with the BLM's determinations of site eligibility to the national register of historic places of one eligible property that would be affected by this project. A Historic Properties Treatment Plan describing the mitigation measures that would be employed to resolve any adverse effect to the one NRHP eligible site has been prepared. A Memorandum of Agreement between the BLM and Nevada SHPO has been implemented to ensure the Historic Properties Treatment Plan will mitigate any adverse effect to the single NRHP-eligible site.

Tribal Consultation. There are no tribal lands affected by this project. Consultation occurred with federally-recognized Indian tribes and with the Nevada State Historic Preservation Office in accordance with the National Historic Preservation Act, the Native American Graves Protection and Repatriation Act , the American Indian Religious Freedom Act, and the Sacred Sites Executive Order 13007, as appropriate.

Clean Water Act. U.S. Army Corps of Engineers (ACOE) has provided consultation on this project, pursuant to Section 404 of the Clean Water Act (CWA). The project is expected to receive a Jurisdictional Decision sometime in the first calendar quarter of 2011.

Land Use Plan Conformance. The 500-MW project is in conformance with the Southern Nevada District 1998 Las Vegas Resource Management Plan (RMP). The RMP provides the following objective and management directions for rights-of-way:

Objective

RW-1. Meet public demand and reduce impacts to sensitive resources by providing an orderly system of development for transportation, including legal access to private in holdings, communications, flood control, major utility transmission lines, and related facilities.

Management Direction

RW-1-h. All public lands within the planning area, except as stated in RW-1-c through RW-1-g, are available at the discretion of the agency for right-of-way under the authority of FLPMA.

Separately, a Solar Energy Development Programmatic EIS (EIS) is being prepared by the U.S. Department of Energy and the BLM. This study will assess environmental impacts related to agency-specific programs that would facilitate utility-scale solar energy development in the six western states of Arizona, California, Colorado, New Mexico, Nevada, and Utah. When completed, the Programmatic EIS may result in the amendment of existing RMPs to adopt new Bureau-wide solar energy policies, along with best management practices to reduce the environmental impacts of solar energy development.

V. Agency and Public Involvement

1. Scoping

An initial 30-day scoping period for the Amargosa Farm Road Solar Energy Project was held from July 13, 2009 to August 12, 2009, as announced in the *Federal Register* (74 FR 33458). Public scoping meetings were not conducted within this timeframe. Therefore, a second notice was published in the *Federal Register* (74 FR 47820), reopening the public scoping period to ensure that all interested parties could participate in the process and announcing the BLM's intent to prepare an environmental impact statement (EIS) evaluating the proposed action. The second scoping period was held from September 17, 2009 to October 19, 2009. The notice also invited Federal, state, and local agencies, as well as individuals or organizations that were interested or may be affected by the BLM's proposed decision on this project to participate in the scoping process and, if eligible, as a cooperating agency. In addition to verbal comments and written comments received during these scoping meetings, the BLM received 36 electronic comment letters and/or emails from private citizens, government agencies, non-governmental organizations (NGOs), and business associations by the October 19, 2009 close of scoping. The BLM also used the NEPA commenting process to satisfy the public involvement process for Section 106 of the National Historic Preservation Act (NHPA) (16 U.S.C. 470f) as provided for in 36 CFR 800.2(d) (3).

2. Draft EIS Public Comment Period

The BLM held a 45-day public comment period starting with publication of the Notice of Availability (NOA) of the Draft EIS by the BLM on March 19, 2010, in the *Federal Register* (75 FR 13301). The BLM received oral testimony at four public meetings held on April 6, 7, 13 and 14, 2010, in Beatty, Amargosa Valley, Pahrump and Las Vegas, respectively. A total of 37 comment letters were received during the 45-day public comment period. The BLM reviewed each comment and developed responses to all substantive comments based on guidance found in the Council on Environmental Quality (CEQ) regulations (40 CFR 1503.4.) As a result of this review, the BLM modified the Final EIS to clarify and improve the analysis. No changes were made to the proposed action or alternatives as a result of public comment.

3. Final EIS Notice of Availability

The NOA for the Final EIS was published by the Environmental Protection Agency (EPA) on Friday, October 15, 2010 in the *Federal Register* (75 FR 63503 and http://edocket.access.gpo.gov/2010/2010-25859.htm). Interested parties and the public were notified by a press release and by direct mail. Hard copies and CD-ROM versions of the Final EIS were made available at the Southern Nevada District, Pahrump Field Office on October 15, 2010. An electronic copy of the Final EIS is posted on the internet at http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy.html. Issuance of this ROD 30 days after publication of the NOA complies with the CEQ NEPA regulations, at 40 CFR 1506.10.

VI. Decision Rationale

The BLM, after careful consideration of the potential effects of the proposed project, has decided to authorize Solar Millennium, LLC to construct a 500-MW concentrated solar power generation facility as described in the Proposed Action of the Final EIS (Alternative 2), including all associated facilities needed for the development and operation of the facility, mitigation measures, and ROW lease/grant stipulations, as shown in Appendices A and B.

Authorization of the facility responds to the BLM's purpose and need to respond to Solar Millennium's application and to determine whether to approve, approve with modifications, or deny issuance of a ROW lease/grant, taking into consideration the provisions of the Energy Policy Act of 2005 and other applicable Federal laws, regulations, and policies.

The BLM considered several key factors including visual resource management, social economics, and water use, in its decision to authorize the project. The Solar Millennium dry-cooled alternative allows for the least amount of water use among the Solar Millennium proposed alternatives. In addition, a stipulated agreement between BLM, USFWS, NPS, and Solar Millennium provides that Solar Millennium will acquire 236

acre-feet per year as mitigation water, to ensure that any potential effects to groundwater levels in the vicinity of Devil's Hole and the Ash Meadows National Wildlife Refuge are mitigated. The stipulated agreement is contained in Appendix D of this ROD.

VII. Final Agency Action

1. Right-of-Way Authorization

It is my decision to approve a solar energy ROW lease/grant to Solar Millennium, LLC, subject to the terms, conditions, stipulations, Plan of Development, and environmental protection measures developed by the Department of the Interior and reflected in this Record of Decision. It is my further decision to re-align Amargosa Farm Road as described in this Record of Decision and Final EIS. This decision is effective on the date this Record of Decision is signed.

Approved by:

NOV 15 2010

Robert V. Abbey
Director
Bureau of Land Management

Date

2. Secretarial Approval

I hereby approve this decision. My approval of this decision constitutes the final decision of the Department of the Interior and, in accordance with the regulations at 43 CFR 4.410(a)(3), is not subject to appeal under Departmental regulations at 43 CFR Part 4. Any challenge to this decision, including the BLM Authorized Officer's issuance of the right-of-way as approved by this decision, must be brought in Federal district court.

Approved by:

NOV 15 2010

Ken Salazar
Secretary
U.S. Department of the Interior

Date

CERTIFICATE OF SERVICE

I hereby certify that I am an employee of Lionel Sawyer & Collins and on December 6, 2010, I caused to be served, a true and correct copy of the foregoing **NOTICE OF FILING OF RECORD OF DECISION** via U.S. Mail or as indicated below to the following parties:

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DATED this 6th day of December, 2010.

Diana L. Wheelen