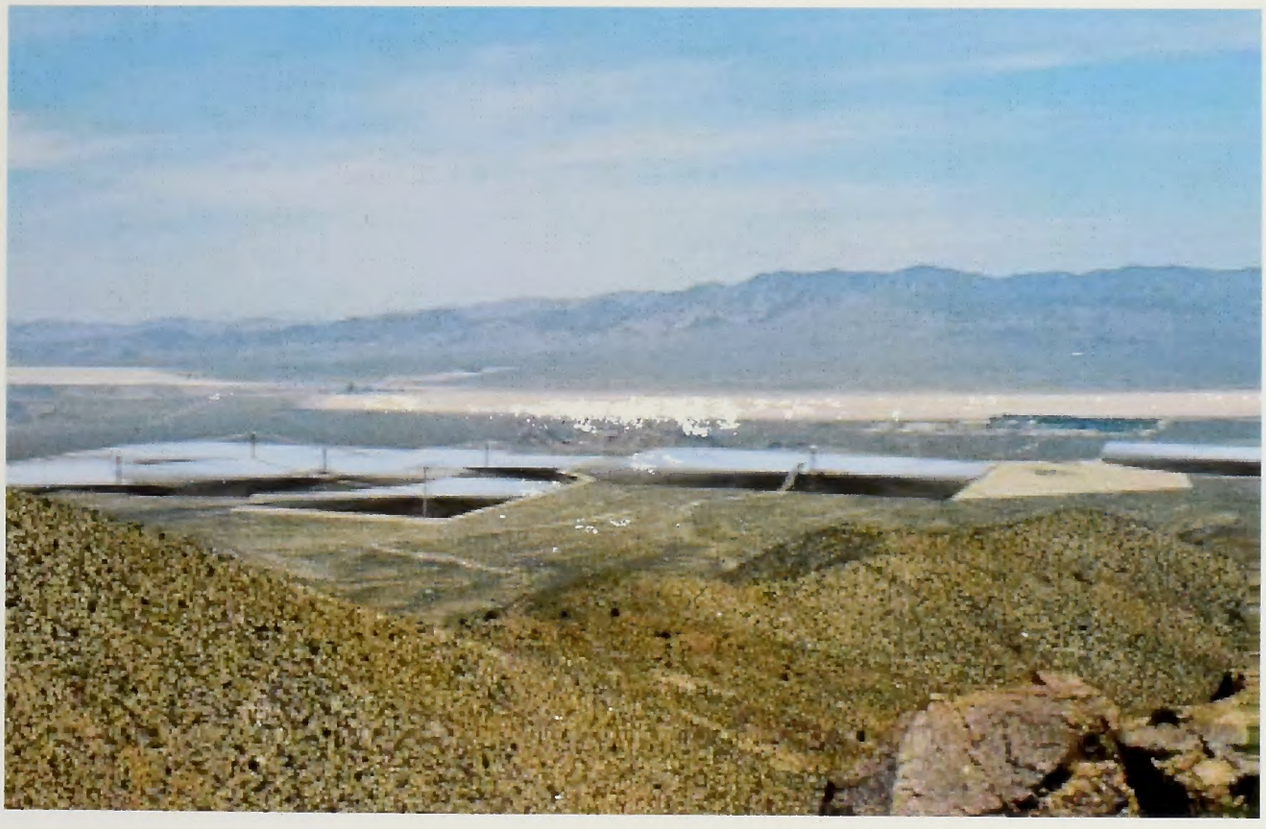
CALIFORNIA DESERT CONSERVATION AREA PLAN AMENDMENT / FINAL ENVIRONMENTAL IMPACT STATEMENT

FOR

IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

FES-10-31

VOLUME III



JULY 2010

BLM

Needles Field Office

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

BLM/CA/ES-2010-010+1793

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Needles Field Office
1303 South U.S. Highway 95
Needles, CA 92363
www.ca.blm.gov/needles

In Reply Refer To:

In reply refer to:
1610-5.G.1.4
2800/CACA-48668

Dear Reader:

Enclosed is the proposed California Desert Conservation Area Plan Amendment and Final Environmental Impact Statement (CDCA Plan Amendment/FEIS) for the Ivanpah Solar Electric Generating System (ISEGS) project. The Bureau of Land Management (BLM) prepared the CDCA Plan Amendment/FEIS for the ISEGS project in consultation with cooperating agencies and California State agencies, taking into account public comments received during the National Environmental Policy Act (NEPA) process. The proposed plan amendment adds the Ivanpah Solar Electric Generating System project site to those identified in the current California Desert Conservation Area Plan, as amended, for solar energy production. The decision on the ISEGS project will be to approve, approve with modification, or deny issuance of the rights-of-way grants applied for by Solar Partners I, II, IV, and VIII.

This CDCA Plan Amendment/FEIS for the ISEGS project has been developed in accordance with NEPA and the Federal Land Policy and Management Act of 1976. The CDCA Plan Amendment is based on the Mitigated Ivanpah 3 Alternative which was identified as the Agency Preferred Alternative in the Supplemental Draft Environmental Impact Statement for ISEGS, which was released on April 16, 2010. The CDCA Plan Amendment/FEIS contains the proposed plan amendment, a summary of changes made between the DEIS, SDEIS and FEIS for ISEGS, an analysis of the impacts of the proposed decisions, and a summary of the written and oral comments received during the public review periods for the DEIS and for the SDEIS, and responses to comments.

The BLM will be accepting additional public comment on the CDCA Plan Amendment/FEIS within 30 days after the Environmental Protection Agency publishes the Notice of Availability in the *Federal Register*. Comments can be sent to: George Meckfessel, Planning and Environmental Coordinator, Needles Field Office, 1303 South Highway 95, Needles, CA 92363, or email caisegs@blm.gov.

Pursuant to the BLM's planning regulations at 43 CFR 1610.5-2, any person who participated in the planning process for the CDCA Plan Amendment and has an interest that is or may be adversely affected by the proposed plan amendment may protest approval of the plan amendment within 30 days from the date the Environmental Protection Agency (EPA) publishes the Notice of Availability in the *Federal Register*. For further information on filing a protest, please see the accompanying protest regulations in the page that follows (labeled as Attachment 1). The regulations specify the required elements in a protest. Protesting parties should take care to

document all relevant facts and, as much as possible, reference or cite the planning documents or available planning records (e.g., meeting minutes or summaries, correspondence, etc.).

All protests must be in writing and mailed to the following address:

Regular Mail:	Overnight Mail:
Director (210)	Director (210)
Attention: Brenda Williams	Attention: Brenda Williams
P.O. Box 66538	1620 L Street, N.W., Suite 1075
Washington, D.C. 20035	Washington, D.C. 20036

Before including your address, phone number, e-mail address, or other personal identifying information in your protest, be advised that your entire protest – including your personal identifying information – may be made publicly available at any time. While you can ask us in your protest to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

All protests must be received by the Director by the close of the protest period to be accepted as valid. Protests that are postmarked by the close of the protest period but received by the Director after the close of the protest period will only be accepted as valid if the protesting party also provides a faxed or e-mailed advance copy before the close of the protest period. To provide the BLM with such advance notification, please fax protests to the attention of Brenda Hudgens-Williams- BLM protest coordinator at 202-912-7129, or e-mail protests to: Brenda_Hudgens-Williams@blm.gov.

The BLM Director will make every attempt to promptly render a decision on each valid protest. The decision will be in writing and will be sent to the protesting party by certified mail, return receipt requested. The decision of the BLM Director shall be the final decision of the Department of the Interior. Responses to protest issues will be compiled in a Director's Protest Resolution Report that will be made available to the public following issuance of the decisions.

Upon resolution of all land use plan protests, the BLM will issue a Record of Decision (ROD) adopting the Approved CDCA Plan Amendment and making a decision regarding issuance of the right-of-way grant. Copies of the ROD will be mailed or made available electronically to all who participated in this NEPA process and will be available to all parties through the Needles Field Office website (*http://www.blm.gov/ca/st/en/fo/needles/nefo_nepa.html*), or by mail upon request.

Sincerely,

Raymond C. Lee
Field Manager, Needles

Attachment 1

Protest Regulations

[CITE: 43CFR1610.5-2]

TITLE 43--PUBLIC LANDS: INTERIOR
CHAPTER II--BUREAU OF LAND MANAGEMENT, DEPARTMENT OF THE INTERIOR
PART 1600--PLANNING, PROGRAMMING, BUDGETING--Table of Contents
Subpart 1610--Resource Management Planning
Sec. 1610.5-2 Protest procedures.

(a) Any person who participated in the planning process and has an interest which is or may be adversely affected by the approval or amendment of a resource management plan may protest such approval or amendment. A protest may raise only those issues which were submitted for the record during the planning process.

(1) The protest shall be in writing and shall be filed with the Director. The protest shall be filed within 30 days of the date the Environmental Protection Agency published the notice of receipt of the final environmental impact statement containing the plan or amendment in the Federal Register. For an amendment not requiring the preparation of an environmental impact statement, the protest shall be filed within 30 days of the publication of the notice of its effective date.

(2) The protest shall contain:

(i) The name, mailing address, telephone number and interest of the person filing the protest;
(ii) A statement of the issue or issues being protested;
(iii) A statement of the part or parts of the plan or amendment being protested;
(iv) A copy of all documents addressing the issue or issues that were submitted during the planning process by the protesting party or an indication of the date the issue or issues were discussed for the record; and
(v) A concise statement explaining why the State Director's decision is believed to be wrong.

(3) The Director shall promptly render a decision on the protest.

(b) The decision shall be in writing and shall set forth the reasons for the decision. The decision shall be sent to the protesting party by certified mail, return receipt requested. The decision of the Director shall be the final decision of the Department of the Interior.

ABSTRACT

ENVIRONMENTAL IMPACT STATEMENT

IVANPAH SOLAR ELECTRIC GENERATING SYSTEM PROJECT

( ) Draft (X) Final

Lead Agency: The United States Department of the Interior, Bureau of Land Management Needles Field Office

Location: San Bernardino County, California

Address Protests on this Proposed Plan Amendment to:

Regular Mail:
Attn: Brenda Williams
Director (210)
PO Box 66538
Washington, DC 20035

Overnight Mail:
Attn: Brenda Williams
Director (210)
1620 L Street NW Suite 1075
Washington, DC 20036

Address Comments on this EIS to: Bureau of Land Management Attention: George Meckfessel, Planning and Environmental Coordinator, 1303 S. Hwy. 95, Needles, CA 92363

or Email: caisegs@blm.gov

Comment Deadline: 30-days from date of EPA Notice of Availability.

The Bureau of Land Management (BLM) has received a proposal from Solar Partners I, II, IV, and VIII, limited liability corporations formed by BrightSource Energy (BrightSource), to construct and operate a solar thermal electric generating facility in San Bernardino County, California. The project would generate up to 400 megawatts (MW) of electricity using solar thermal technology.

The proposed project was analyzed in a Draft Environmental Impact Statement that was published on November 13, 2009. The proposed project consists of three separate solar generating facilities, each consisting of a field of heliostats (mirrors) reflecting solar radiation to the top of a 459-foot tall power tower received unit. Heated fluid within the power tower receivers would be used to boil water to generate steam, which would turn a turbine and generate electricity. The permanent ROW required for the heliostat fields and power towers would occupy approximately 3,670 acres. An additional 377 acres would be used to support a Construction Logistics Area, and for shared facilities such as an administration building, maintenance warehouse, substation, and groundwater supply wells. Approximately 24 acres would be used for a natural gas supply pipeline ROW, and for access roads. The proposed project would cause the surface disturbance of approximately 4,073 acres during construction.

Two additional alternatives were considered in detail in the Supplemental Draft Environmental Impact Statement (SDEIS), which was published by BLM on April 16, 2010. SDEIS analyzed a reduced acreage alternative called the Mitigated Ivanpah 3 Alternative, and a reconfigured alternative called the Modified I-15 Alternative. The facility evaluated in each of these alternatives is a solar thermal electric generating facility with a generating capacity of 370 MW.

The Mitigated Ivanpah 3 Alternative is identified as the agency preferred alternative in this EIS.

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LIST OF ACRONYMS

$\mu g/m^3$	micrograms per cubic meter
AAQS	ambient air quality standards
AB	Assembly Bill
AC	alternating current
ACC	air cooled condensers
ACEC	Area of Critical Environmental Concern
AED	automatic external defibrillator
AFY	acre-feet per year
AFC	Application for Certification
AML	Appropriate Management Levels
amsl	above mean sea level
ANSI	American National Standards Institute
AO	Authorized Officer
APLIC	Avian Powerline Interaction Committee
AQCMM	Air Quality Construction Mitigation Manager
AQCMP	Air Quality Construction Mitigation Plan
ARB	Air Resource Board
ARMR	Archaeological Resource Management Report
ARRA	American Recovery and Reinvestment Act of 2009
ASME	American Society for Material Engineering
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
ATC	Authority to Construct
ATCM	Airborne Toxic Control Measure
AUM	animal unit months
BA	Biological Assessment
BACT	Best Available Control Technology
BCC	Birds of Conservation Concern
BLM	Bureau of Land Management
BMP	best management practice
BNSF	Burlington Northern Santa Fe
BO	Biological Opinion
BOE	Board of Equalization
BRMIMP	Biological Resources Mitigation Implementation and Monitoring Plan
BVUSD	Baker Valley Unified School District
CAA	Clean Air Act
CAISO	California Independent System Operator
Cal-ARP	California Accidental Release Program
CAM	crassulacean acid metabolism
CAPCOA	California Air Pollution Control Officers Association
CBO	Chief Building Official
CBSC	California Building Standards Code

CCDOA	Clark County Department of Aviation
CCR	California Code of Regulations
CCSD	Clark County School District
CCTV	Closed Circuit TV
CDCA	California Desert Conservation Area
CDD	California Desert District
CDFA	California Department of Food and Agriculture
CDFG	California Department of Fish and Game
CDMG	California Department of Water Resources
CDPH	California Department of Public Health
CEMS	continuous emissions monitoring system
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFATS	Chemical Facility Anti-Terrorism Standard
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGS	California Geological Survey
CHP	California Highway Patrol
CHRIS	California Historical Resources Information System
CLA	Construction Logistics Area
CMP	Congestion Management Plan
CNDDB	California Department of Fish and Game Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
COC	Condition of Certification
CPM	Construction Project Manager
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CRM	Cultural Resource Monitor
CRMMP	Cultural Resources Monitoring and Mitigation Plan
CRR	Cultural Resource Report
CRS	Cultural Resources Specialist
CSP	Concentrated Solar Power
CSS	Construction Safety Supervisor
CUPA	Certified Unified Program Authority
CVC	California Vehicle Code
CWA	Clean Water Act
DEHS	Department of Environmental Health Services
DEIS	Draft Environmental Impact Statement
DEM	digital elevation model
DESCP	Drainage Erosion and Sediment Control Plan
DHS	U.S. Department of Homeland Security
DOE	U. S. Department of Energy

DOI	U. S. Department of Interior
DOT	U.S. Department of Transportation
DPA	Desert Protection Act
DPM	Diesel Particulate Matter
DPR	Department of Parks and Recreation
DRP	Demand Response Program
DTRO	Desert Tortoise Recovery Office
DTRPAC	Desert Tortoise Recovery Planning Assessment Committee
DTSC	Department of Toxic Substances Control
DWMA	Desert Wildlife Management Area
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EITL	Eldorado-Ivanpah Transmission Line
EITP	Eldorado-Ivanpah Transmission Project
EMF	electric and magnetic field
EMS	emergency medical services
EPA	U.S. Environmental Protection Agency
EPAct	Energy Policy Act of 2005
EPS	Emission Performance Standard
ERC	emission reduction credit
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FDOC	Final Determination of Compliance
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FGR	flue gas recirculation
FHWA	Federal Highway Administration
FLPMA	Federal Land Policy and Management Act
FONSI	Finding of No Significant Impact
fps	feet per second
FSA	Final Staff Assessment
FTA	Federal Transit Administration
GHG	Greenhouse Gas
GPS	global positioning system
GWh	gigawatt-hours
H_2S	hydrogen sulfide
HAER	Historic American Engineering Record
HAP	Hazardous Air Pollutant
HARP	Hotspots Analysis and Reporting Program
HDP	Heritage Documentation Program
HFC	hydrofluorocarbon
HI	Hazard Index
HMA	Herd Management Area
HMBP	Hazardous Materials Business Plan

hp	horsepower
HSC	Health and Safety Code
IEEE	Institute of Electrical and Electronics Engineers
IEPR	Integrated Energy Policy Report
IIPP	Injury and Illness Prevention Program
IM	Instruction Memorandum
ISC	Interruptible Service Contract
ISEGS	Ivanpah Solar Electric Generating System
ISO	Independent System Operator
IVAB	Ivanpah Valley Air Basin
IVGB	Ivanpah Valley Groundwater Basin
KOP	Key Observation Point
KRGT	Kern River Gas Transmission Company
kV	kilovolt
kW	kilowatt
lb	pound
LID	Low-Impact Development
LOS	Level of Service
LRP	Load Reduction Program
LVMPD	Las Vegas Metropolitan Police Department
m	meter
MBTA	Migratory Bird Treaty Act
MCL	Maximum Contaminant Levels
MCLB	Marine Corps Logistics Base
MCR	Monthly Compliance Report
MDAB	Mojave Desert Air Basin
MDAQMD	Mojave Desert Air Quality Management District
MEER	mechanical and electrical equipment room
mG	milligauss
mg/l	milligrams per liter
MLD	Most Likely Descendent
MMBtu/hr	million British thermal units per hour
MNP	Mojave National Preserve
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MPE	maximum permissible exposure
mph	miles per hour
MSA	Metropolitan Statistical Area
MT	metric tons
MTCO2E	metric tons of CO_2 equivalent
MUC	Multiple-Use Class
MVA	megavolt-ampere
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission

NCA	Noise Compatibility Area
NEMO	Northern and Eastern Mojave
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
NFWF	National Fish and Wildlife Foundation
NH_3	ammonia
NHPA	National Historic Preservation Act
NIOSH	National Institute of Safety and Health
NO	nitric oxide
NO_2	nitrogen dioxide
NO_3	nitrates
NOA	Notice of Availability
NOI	Notice of Intent
NOx	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
NSPS	New Source Performance Standards
NSR	New Source Review
NTP	Notice to Proceed
O&M	operations and maintenance
O_3	ozone
°C	degrees Celsius
OCA	Off-site Consequence Analysis
OEHHA	Office of Environmental Health Hazard Assessment
OHV	off-highway vehicle
OLM	Ozone Limiting Method
ORV	off-road vehicle
OSHA	Occupational Safety and Health Administration
OTC	once-through cooling
PAH	Polynuclear Aromatic Hydrocarbon
PAO	Public Adviser's Office
PAR	Property Analysis Record
PCF	paid-call firefighters
PDOC	Preliminary Determination of Compliance
PEA	Proponent's Environmental Assessment
PEIS	Programmatic Environmental Impact Statement
PFC	perfluorocarbon
PM	Particulate Matter
PMAP	Particulate Matter Attainment Plan
PMI	point of maximum impact
POD	Plan of Development
PPE	personal protective equipment

ppm	parts per million
PRC	Public Resources Code
PRM	Paleontological Resource Monitors
PRMMP	paleontological resources monitoring and mitigation plan
PRR	Paleontological Resources Report
PRS	paleontological resource specialist
PSA	Preliminary Staff Assessment
PSD	Prevention of Significant Deterioration
PTO	Permit to Operate
PTZ	pan, tilt, and zoom
PUP	Pesticide Use Proposal
PV	photovoltaic
PVMRM	Plume Volume Molar Ratio Method
PYFC	Potential Fossil Yield Classification
QFER	Quarterly Fuel and Energy Report
RC	Resource Conservation
RCRA	Resource Conservation Recovery Act
REAT	Renewable Energy Action Team
RETI	Renewable Energy Transmission Initiative
RMP	Resource Management Plan
ROD	Record of Decision
ROW	right-of-way
RPS	Renewables Portfolio Standard
RWQCB	Regional Water Quality Control Board
SAC	Science Advisory Committee
SANBAG	San Bernardino Associated Governments
SB	Senate Bill
SBAIC	San Bernardo Archeological Information Center
SBCFD	San Bernardino County Fire Department
SCADA	Supervisory Control and Data Acquisition
SCE	Southern California Edison
SDEIS	Supplemental Draft Environmental Impact Statement
SEGS	Solar Electric Generating System
SF_6	sulfur hexafluoride
SHPO	State Historic Preservation Officer
SMARA	Surface Mining and Reclamation Act
SO_2	sulfur dioxide
SO_4	sulfates
SOx	sulfur oxide
SPCC	spill prevention, control, and countermeasures
STG	steam turbine-generator
SVP	Society of Vertebrate Paleontology
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resource Control Board

TAC	toxic air contaminant
TCP	Traffic Control Plan
TDS	total dissolved solids
TUC	Transportation Utility Corridor
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
USCS	Unified Soils Classification System
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
V/C	volume-to-capacity
VMT	vehicle miles travelled
VOC	volatile organic compound
VR	Visual Resource
VRI	Visual Resource Inventory
VRM	Visual Resource Management
WA	Wilderness Area
WEAP	Worker Environmental Awareness Program
WEC	wave energy conversion
WECC	Western Electricity Coordinating Council
WIU	Wilderness Inventory Units
WWTP	Wastewater Treatment Plant

APPENDIX A-1
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM SUMMARY OF PUBLIC AND AGENCY COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS) AND AGENCY RESPONSES
JULY 2010

Key to Commentors

Commentor	ID #	Affiliation
Kevin Emmerich	1	Basin and Range Watch
Ileene Anderson, Lisa T. Belenky	2	Center for Biological Diversity
Sidney Silliman	3	Sierra Club San Gorgonio Chapter and Desert Committee
Scott Cashen	4	Sierra Club
Gloria Smith	5	Senior Attorney, Sierra Club
Kathleen M. Goforth	6	Environmental Protection Agency, Region IX
Kim Delfino, Joshua Basofin	7	Defenders of Wildlife
Michael J. Connor, Ph.D.	8	California District, Western Watershed Project
Rory D. Westberg	9	Acting Regional Defense Council, National Park Service
Joanna H. Walk, Alice Bond, Alex Daue	10	Natural Resource Defense Council, The Wilderness Society
Greg Suba	11	California Native Plant Society
Glenn R. Stewart	12	Desert Tortoise Council
Steve Knight	13	Assemblyman, 36th Assembly District
Anthony Adams	14	Assemblyman, 59th Assembly District
Ann Vanino	15	Moving Forward
Deleted	16	Comments not associated with the DEIS
Richard Sierra, Jr.	17	Hod Carriers Local 783
Mike Vandeman, Ph.D	18	Pacbell
Violette Roberst	19	Mojave Environmental Education Consortium
J. Stephan Dolezalek	20	Vantage Point Venture Partners
Brendan Hughes	21	
Nancy Schultz	22	
Rocco Davis	23	LiUNA! Pacific Southwest Regional Office
Robin Kent	24	
Sue Wainscott	25	Desert Conservation Program
Laura Cunningham	26	Desert Ecologist, Basin and Range Watch
Carrie Hyke	27	County of San Bernardino, Land Use Services Department
Cindy MacDonald	28	CRM
Deleted	29	Comments not associated with DEIS
David Lamfrom	30	National Parks Conservation Association
John L. Carrier	31	CH2MHill
Mia P. Ratcliff	32	Clark County Department of Aviation
Tom Budlong	33	
Chris Clarke	34	Private Citizen
Mass Mailing	35	

Dennis Nowicki	36	
Eileen Hennessy	37	
Connie Conway	38	Assemblywoman, District 34
Glenn R. Stewart	39	The Desert Tortoise Council

INTRODUCTION

The Draft Environmental Impact Statement (DEIS) for the Ivanpah Solar Electric Generating System (Ivanpah SEGS) project was published in November, 2009, and the public comment period expired on February 11, 2010. The following sections have organized the comments into categories, in order to facilitate technical review, development of responses, and, where needed, revision to the text in the Final EIS.

1.0 GENERAL COMMENTS

1.1 General Sufficiency of DEIS

Comment ISEGS-6-1: On January 16, 2008, EPA provided extensive formal scoping comments for the ISEGS Project which included a variety of detailed recommendations regarding purpose and need, range of alternatives, and resource areas of concern. Based on our review of the ISEGS DEIS, we have rated the document as Environmental Concerns - Insufficient Information (EC-2). Please see the enclosed "Summary of EPA Rating Definitions." In the enclosed detailed comments, EPA provides specific recommendations regarding analyses and documentation to assist in assessing potential significant impacts from the proposed ISEGS Project. Specifically, EPA is concerned with the: 1) current justification for the Project purpose, need, and independent utility; 2) range of alternatives; 3) impacts to biological and aquatic resources; 4) impacts to air quality; 5) impacts to endangered species and other species of concern; and, 6) cumulative impacts from reasonably foreseeable future actions.

Comment ISEGS-6-2: While EPA is pleased with certain aspects of this Project including the use of dry cooling, the close proximity to current highway infrastructure, and a 5% maximum energy production cap on natural gas, EPA recommends that the forthcoming Supplemental DEIS (SDEIS) provide additional analyses (including any necessary supporting documentation) and identify specific minimization or mitigation measures, as appropriate, regarding the issue areas below. (Specific recommendations are included in the following detailed comments.)

- Project Purpose, Need, and Independent Utility
- Range of Alternatives
- Biological and Aquatic Resources
- Air Quality (including impacts from construction)
- Endangered Species and Other Species of Concern
- Cumulative Impacts (from reasonably foreseeable future actions)

Response: *BLM has reviewed and evaluated all public comments received on the Draft EIS (DEIS), and also evaluated information received through the California Energy Commission (CEC) hearing process. The Supplemental Draft EIS (SDEIS), published on April 16, was specifically developed to address many of the comments, including those associated with the Purpose and Need, the range of alternatives, and Biological Resources/endangered species. Other specific comments on cumulative impacts and*

air quality were evaluated, and are addressed through text modifications in their respective sections in the Final EIS (FEIS).

1.2 General Objection to Project

Comment ISEGS-22-1: I oppose the Ivanpah Solar Electric Generating System, it is a plan that does not fit the desert for three main reasons, the impacts to the fragile natural resources are too great, the amount of water needed is too great and a mitigation plan is not in place to address translocation, water depletion, and loss of public space.

Comment ISEGS-11-1a: CNPS supports the development of alternative, green energy sources, as long as those projects do not unnecessarily degrade healthy, diverse ecosystems. The proposed ISEGS project will cause significant, avoidable, adverse impacts to native vegetation communities and significant impacts to rare plant populations on the site, and within the surrounding Ivanpah Valley area. These impacts will have permanent (i.e., effects will persist for thousands of years) effects on ecosystem functions that have been evolving within the Ivanpah Valley for millennia. The area within the proposed project footprint will be affected directly, and the areas surrounding the project footprint will be affected indirectly during project construction and operational phases.

Response: *The comments opposing the proposed project are appreciated. These comments were considered in the selection of the preferred alternative in the FEIS, and will be considered in the decision whether or not to issue a right-of-way grant in the Record of Decision.*

1.3 General Support for Project

Comment ISEGS-15-1: As a resident of the High Desert region, I am writing to express my support for Bright Source energy's Ivanpah project. The project represents a significant economic development opportunity for the High Desert region and a major step towards achieving our state's and nation's clean energy and economic goals.

Comment ISEGS-14-4: California and the nation need BrightSource's Ivanpah SEGS project, and others like it, to launch a stronger, more independent and competitive economy that once again proudly leads the world. I ask that BLM and CEC undertake everything in their power to promptly approve and support the development of the Ivanpah SEGS project.

Comment ISEGS-14-1: I am writing in support of Bright Source Energy's Ivanpah Solar Energy Generating System (ISEGS) project, and urge the California Energy Commission (CEC) and the U.S. Bureau of Land Management (BLM) to promptly and successfully complete its permitting process. This utility-scale solar project will bring needed economic development and jobs to California's High Desert, including to my own district. By itself, the Ivanpah project is a great opportunity for our region;

importantly, it also represents the first major step in building the new solar industry that will greatly benefit our region.

Comment ISEGS-13-4: California and the nation need BrightSource's Ivanpah SEGS project, and others like it, to launch a stronger, more independent and competitive economy that once again proudly leads the world. I ask that BLM and CEC promptly approve and support the development of the Ivanpah SEGS project.

Comment ISEGS-13-1: Brightsource Energy's Ivanpah Solar Energy Generating System (ISEGS) project will bring needed economic development and jobs to California's High Desert, including my district. The project represents a tremendous opportunity for our region by itself, but is also an important first step in building the new solar industry that will greatly benefit our region. I support the Ivanpah SEGS project, and ask that the California Energy Commission (CEC) and the U.S. Bureau of Land Management (BLM) issue permits for its prompt development.

Comment ISEGS-23-2: We understand the environmental challenges that a project such as Ivanpah presents, particularly given its large footprint, but those are challenges that are being thoroughly and deliberately worked out. BrightSource has adopted environmentally friendly strategies such as dry cooling to minimize water usage, and a low impact design to minimize impacts to the desert topography and plants.

No short cuts are being taken with a project as important as this!

We are confident that BrightSource is taking environmental responsibility very seriously in constructing and operating this important project. Let's not forget that the project will help clean the air and protect our desert climate.

We believe that BrightSource and other solar energy projects will provide greatly needed economic benefits to the High Desert and respect the environment at the same time. Please join us in supporting the proposed Ivanpah project as it leads our region back to economic prosperity and puts the High Desert on the vanguard of a new and promising industry.

Comment ISEGS-17-3: We understand the environmental challenges that a project such as Ivanpah presents, particularly given its large footprint, but those are challenges that are being thoroughly and deliberately worked out. BrightSource has adopted environmentally friendly strategies such as dry cooling to minimize water usage, and a low impact design to minimize impacts to the desert topography and plants.

No short cuts are being taken with a project as important as this!

We are confident that BrightSource is taking environmental responsibility very seriously in constructing and operating this important project. Let's not forget that the project will help clean the air an protect our desert climate.

Comment ISEGS-17-1: I am writing to express support for BrightSource Energy's Ivanpah Solar Energy Generating System.

Comment ISEGS-19-1: I am writing to express support for BrightSource Energy's Ivanpah Solar Energy Generating System.

Comment ISEGS-38-1: I am writing to express my support for BrightSource Energy's Ivanpah Solar Energy Generating System. When constructed, this project will produce more solar energy than all of the rooftop solar installed in the nation last year, and will more than double the amount of solar thermal energy produced in the U.S. today. The Ivanpah project represents a tremendous economic development opportunity for the High Desert region, and a major step towards achieving California's and the nation's clean energy and economic goals.

Comment ISEGS-38-6: I believe this project, and the innovative clean technology it employs, is a major step forward towards a stronger, more competitive economy for the High Desert Region, California and the nation, as well as an important contribution to our renewable energy and climate protection. I urge you to timely approve BrightSource's Ivanpah project.

Comment ISEGS-20-1: In short, this Ivanpah project is not merely "one among many," of which there will be many more to come. BrightSource Energy, through projects like this one, is uniquely positioned to serve as a powerful force in California's ability to meet its energy needs and goals; there is currently no comparable substitute in the renewable energy market. Consequently, to impede this project would substantially impact the ability of California utilities to meet our state's renewable energy targets overall. It would also be highly unfortunate for the State to give up the opportunity to take advantage of what could potentially be a very substantial amount of federal funding support, especially during a time of state budget crisis. BrightSource is poised and ready to scale up now, and the federal government is poised to very likely support this. But if this project and company do not get off the ground now, it could be many years before another similarly promising and well-equipped provider can arise to take its place.

Comment ISEGS-15-4: The Ivanpah project will produce enough clean energy to provide 150,000 homes in California with clean electricity. Ivanpah will be the first project to meet BrightSource Energy's contracts with PG&E and SCE, and the first BrightSource project to help meet California's 33 percent renewable energy and climate change requirements.

In recognition for its vitally important role in helping our nation meet its clean energy and economic goals, the Ivanpah project has been identified as a "fast-track" priority by the U.S. Department of Interior for obtaining federal stimulus benefits for California under the 2009 American Recovery and Reinvestment Act (ARRA). The project has also been selected as one of sixteen short-listed applicants to receive a loan guarantee under the U.S. Department of Energy (DOE) 1703 program, established by the 2005 Energy Policy Act, and is the only utility-scale solar project so selected.

Comment ISEGS-14-3: When constructed, Ivanpah SEGS will produce more solar energy than all of the rooftop solar installed in the nation last year, and will more than double the amount of solar thermal energy produced in the U.S. today. It will produce enough clean energy to provide 150,000 homes in California with clean electricity free from fossil-fuel price volatility. Ivanpah SEGS will be the first project to meet BrightSource Energy's world-leading contracts with PG&E and SCE, and the first BrightSource project to help meet California's 33 percent renewable energy and climate change requirements. Ivanpah SEGS has been designed to minimize its environmental impacts. It will reduce water usage by 90 percent by using dry cooling, allowing Ivanpah to use approximately 30 times less water than competing technologies. The project will use roughly 100 acre feet of water - the equivalent of 300 homes' annual water usage, and far less than the amount used by the adjacent golf course or nearby casinos. The project will also avoid more than 13 million tons of CO2 emissions over its 30-year lifecycle, as well as 85 percent of the air emissions from an equally sized natural gas plant. Its low-impact design reduces grading and minimizes need for concrete pads, keeping much of the site's vegetation in place. The project also makes use of the currently-used high-voltage transmission pathway that transects the site.

In recognition for its vitally important role in helping our nation meet its clean energy and economic goals, Ivanpah SEGS has been identified as a "fast-track" priority by the U.S. Department of Interior for obtaining federal stimulus benefits for California under the 2009 American Recovery and Reinvestment Act (ARRA). The project has also been selected as the only utility-scale solar project of the sixteen applicants shortlisted for a loan guarantee under the U.S. Department of Energy (DOE) 1703 program.

Comment ISEGS-38-4: The plants will reduce water usage by 90 percent by using dry cooling, allowing Ivanpah to use approximately 30 times less water than competing technologies. The project will use roughly 100 acre feet of water annually- the equivalent of 300 homes.

Comment ISEGS-19-4: The plants will reduce water usage by 90 percent by using dry cooling, allowing Ivanpah to use approximately 30 times less water than competing technologies. The project will use roughly 100 acre feet of water - the equivalent of 300 homes' annual water usage, and far less than the amount used by the adjacent golf course or nearby casinos.

Ivanpah will not only provide clean energy to serve more than 150,000 homes in California during the peak hours of the day. The project will also serve as an educational resource for high schools and colleges in the High Desert who are developing curriculum for green technology and teaching students how to adapt the skills needed to work on renewable energy projects such as Ivanpah.

The High Desert Region is in need of these jobs and the energy plants such as Ivanpah will provide.

Comment ISEGS-36-1: This project is one of many that should be coming to the San Bernardino County and Mojave Desert areas in the coming years. With the current economic conditions the area faces, Brightsource is providing a much needed service, energy, and over 1,000 construction jobs to the area. Those jobs are few and far between in San Bernardino County.

Comment ISEGS-36-3: And personally, I would like to see alternative energy projects created wherever feasible. I am an Army Captain days away from a third Middle East deployment - and can confirm that one of the main reasons the U.S. Army has been in Iraq for the better part of a decade is because of the need to control the oil supply coming out of that region. Brightsource will not be the end-all to the United States' conversion away from Middle Eastern oil, but it will be a great start.

Comment ISEGS-13-3: When constructed, Ivanpah SEGS will produce more solar energy than all of the rooftop solar installed in the nation last year, and will more than double the amount of solar thermal energy produced in the US, today, It will produce enough clean energy to provide 150,000 homes in California with clean electricity free from fossil fuel price volatility.

Ivanpah SEGS has been designed to minimize its environmental impacts. It will reduce water usage by 90 percent by using dry cooling, allowing Ivanpah to use approximately 30 times less water than other technologies. The project will also avoid more than 13 million tons of CO2 emissions over its 30-year lifecycle, as well as 85 percent of the air emissions from an equally sized natural gas plant. Its low-impact design reduces grading and minimizes need for concrete pads, keeping much of the site's vegetation in place, The project also makes use of the currently used high-voltage transmission pathway that transects the site. In recognition for its vitally important role in helping our nation meet its clean energy and economic goals, Ivanpah SEGS has been identified as a "fast-track" priority by the U.S. Department of Interior for obtaining federal stimulus benefits for California under the 2009 American Recovery and Reinvestment Act (ARRA). The project has also been selected as the only utility-scale solar project of the sixteen applicants short-listed for a loan guarantee under the U.S. Department of Energy (DOE) 1703 program.

Comment ISEGS-38-5: Brightsource Energy's environmental considerations to reduce development impacts at its Ivanpah project also include a low-impact design and use of a currently-used high-voltage transmission pathway that transects the site. The low impact design utilizes Brightsource's proprietary solar mirror system, which minimizes the need for grading and concrete pads required for competing technologies. The Ivanpah project will produce enough clean energy to supply 150,000 homes in California, and reduce California ratepayers from exposure to fossil-fuel price volatility.

Comment ISEGS-35-1: Yes, I want green jobs in the High Desert. Yes, I want locally-generated solar energy. Yes, I support the Ivanpah Solar Energy Generating System.

Response: *The comments in support of the proposed project are appreciated. These comments were considered in the selection of the preferred alternative in the FEIS, and will be considered in the decision whether or not to issue a right-of-way grant in the Record of Decision.*

2.0 ALTERNATIVES

2.1 Comments on Location of Proposed Project on Undeveloped Land

Comment ISEGS-28-12: A truly sustainable plan must begin in already developed areas such as Las Vegas, where solar panels can be utilized in already industrialized areas. Solar plates can be placed directly on existing structures and directly fed into existing power grids; no water required, no additional ROWs, no destroying of soil leading to massive erosion and dust pollution (I LIVE HERE AND KNOW WHAT THESE DUST STORMS ARE LIKE WHEN THE WIND PICKS UP!) no total ecosystem annihilation, no impacts to the Threatened Desert Tortoise – it's a no brainer!

Destroying more of our environment and wasting our resources for the benefit of corporate control and corporate profits must stop. This is NOT GREEN ALTERNATIVES! This is more of the same old school mentality that has led our Nation to the current crisis this proposal is supposedly attempting to compensate for!

Comment ISEGS-18-1: Our top priority needs to be the preservation of wildlife habitat. We have already destroyed FAR too much. Therefore, any solar project needs to be located where it won't impact wildlife, such as on top of buildings and above roadways and parking lots. Thus, NO solar project should or needs to be located in the desert, which is habitat for the endangered desert tortoise and many other species of concern.

Comment ISEGS-11-2a: Habitat fragmentation, loss of connectivity for terrestrial wildlife, and introduction of predator and invasive weed species associated with the ISEGS project in the proposed location are anathema to an effective climate change adaptation strategy. Siting the proposed ISEGS project in the proposed location in Ivanpah Valley confounds our climate change adaptation strategy with a poorly executed climate change mitigation strategy. CNPS maintains that the solution to this problem is to build and operate the proposed ISEGS project in an alternative site away from intact wild lands. The way to maintain healthy, vibrant ecosystems is to preserve their intact nature, not to fragment them and reduce their biodiversity.

Comment ISEGS-33-3: NEPA's Title I, Section 101, details basic and fundamental goals. Following are quotes from this section, and then the full text of the section. In relating the quotes to the proposed project, it is important to keep in mind that the proposed project will completely use up undeveloped, essentially virgin land. The land will convert from pristine, virtually untouched, to a high-intensity industrial zone. It will destroy all life and environmental benefits of the property. It will be a complete change in the visual impact, completely inconsistent with visually adjacent lands...Here is the text of NEPA's introduction, the source of the quotes:...

Comment ISEGS-24-1: I am appalled by your decision to fast track this destructive project. Despite my own belief in the need to wean ourselves from non green energy, the benefits of this project do not outweigh its damage to endangered species and the Mojave desert as a whole. Why is pristine land being considered first for this project? There are many areas of degraded agricultural lands, dead lakebeds and vacant lots that are much more appropriate for solar projects. You are not acting as responsible stewards for the land or for the people of the US by going forward with this project, especially now that your own EIS reveals that you cannot mitigate for the destruction of rare plants or the loss of desert tortoises. I am ashamed that this project is being touted as green, when nothing could be further from the case.

Comment ISEGS-34-1: I am confident many will address the abundant technical, hydrological, and wildlife related problems contained in the proposal to bulldoze a broad swath of publicly owned ancient desert habitat for private industrial development...Paving thousands of acres of the Ivanpah Valley with mirrors would utterly destroy the wild character of the place. It would be an encroachment on the peace of the Preserve and the lands around it, with the noise and dust of construction and the subsequent blinding glare of the completed facility an intrusion into a peace I have found nowhere else on earth...It was one of those moments I have found surprisingly common in the Ivanpah Valley, a place that though altered by human hands is still precious, still wild in essence, well worth being defended from further unnecessary and destructive change. I urge you to halt this project.

Comment ISEGS-21-5: Finally, BLM and CEC approval of this project will create a terrible precedent for future solar projects on public land. There are many thousands of acres of public and private land that are seriously disturbed and degraded, and have virtually no conservation or carbon-sequestration value. It should be a priority for BLM and CEC to get this first project right and place it on such lands. If the Ivanpah SEGS is approved, then more areas with tortoise habitat and rare plant assemblages will be graded for solar farms, and the cumulative impacts of such sitings could cause species decline and perhaps even extinction. BLM and CEC should send a message to solar developers that it is not open season on the desert. Please ensure that only thoroughly-researched, properly sited projects will be approved.

Comment ISEGS-35-2: With energy developers eyeing nearly a million acres in the California desert for utility-grade solar, wind and geothermal energy projects, we can't afford to make mistakes that could destroy our irreplaceable desert landscapes and the amazing wildlife they support . We need to do everything we can to get it right the first time. Many people assume the desert is the best place to put large-scale solar facilities because they think of the desert as a barren place that's devoid of life . But in reality, this couldn't be further from the truth. California's Mojave and Sonoran Deserts are home to some of the most unique and endangered wildlife in the world, from desert tortoises to bighorn sheep to burrowing owls. Big solar projects will have big impacts. That's why we need to ensure these projects are located in appropriate places that will

have the least impact on the desert's fragile wildlife and ecosystems -- areas that are near existing highways, cities and transmission lines.

Comment ISEGS-35-3: There is plenty of land in the California desert that is well-suited to accommodate a utility-grade facility, but won't cause unnecessary destruction to what are now nearly pristine, ecologically sensitive lands. The BrightSource project is the first big solar project to go through this review process, with more than one hundred other large-scale applications in line behind it. The decisions that state and federal government agencies make right now will set a powerful precedent - - and could have devastating and irreversible consequences for wildlife in California and beyond. We don't have to choose between moving forward with renewable energy projects and making sure desert tortoises , bighorn sheep and other imperiled wildlife are protected -- we just have to do renewable energy development right the first time. Thank you for considering my views on this important subject. I look forward to your reply.

Comment ISEGS-26-3: Bureau of Land Management should not permit the ISEGS development from destroying this rich desert fan habitat, and should allow the burro herd to continue using the area. The cattle allotment should be retired, as the use by those animals appears to be heavy in places. The area is very good Desert tortoise habitat, and should be considered for management as an Area of Critical Environmental Concern or special management area for burros and wildlife.

Comment ISEGS-27-9: Impacts to Biological Resources are considered significant and unavoidable. We struggle with accepting that they are unavoidable, as another site in a more disturbed area might result in a different finding.

Comment ISEGS-11-4: As noted in the FSA/DEIS, in CNPS's written opening testimony, and in CNPS's direct oral testimony (ISEGS Evidentiary Hearings Transcripts of 1/12/10 pp.223-253), peripheral populations are important for the long-term conservation of genetic diversity and evolutionary potential of a species, particularly within the context of uncertain climatic changes to their habitat (Hampe and Petit, 2005; Lesica and Allendorf, 1995).

CNPS would like to emphasize the contradictory approach to climate change mitigation represented by siting the project in its currently proposed location. One of the benefits of utility-scale solar projects will be their reduction of greenhouse gas emissions resulting from decreased need to rely on the combustion of fossil fuels for energy. However, if the implementation of this climate change mitigation strategy (greenhouse gas reduction) comes at the expense of reducing the native biodiversity of intact biotic communities (desert tortoise habitat, high quality vegetation alliances), and rare plant populations, then the benefit of the project is greatly reduced.

The Ivanpah Valley fan site is a large intact area of creosote-bursage scrub that is relatively free of weeds. The FSA/DEIS describes the site as "particularly high quality in terms of species richness and diversity, including rich cactus and succulent diversity, creosote rings, micro-topographic diversity (upon which several of the special-status

species depend), and currently contains relatively few non-native plants." (FSA, Biological Resources p. 6.2-37).

In A Manual of California Vegetation, (Sawyer et al., 2008) the authors describe threats to the Larrea tridentata-Ambrosia dumosa Shrubland Alliance (Creosote bush-white burr sage scrub) found at the proposed site as follows: "The presence of several non-native plants, particularly Brassica tournefortii, Bromus spp., and Schismus spp., has greatly increased fire frequencies and led to the degradation and destruction of many hectares of this alliance. Long-term, intensive grazing, OHV activity, mining, and military operations have also left their mark.... We need to identify, monitor, and manage areas free of these degrading influences" (page 568).

In addition, the authors state that Creosote bush-white burr sage scrub associations occurring with Pleuraphis rigida (Big galleta grass), and "those with a diverse shrub layer are G1/S1" (page 566). The G1/S1 (Global/ State) status rank means that the plant community is considered globally/state uncommon with "fewer than 6 viable occurrences worldwide/statewide, and/or up to 518 hectares" (page 45). The Ivanpah site plant community has galleta grass and a diverse shrub layer. The qualities of this site, as well as similar areas throughout the Ivanpah Valley and indeed the California Desert Conservation Area are just those types of wild lands that our climate change strategies should be addressing through protection, rather than destruction.

Comment ISEGS-9-15: 6.12-42 includes discussion of an "urban frame of reference . " This may be acceptable in areas of dense or urban development. There are other alternatives to reference with locations more compatible with the surrounding natural landscape.

Response: *BLM appreciates the concerns raised regarding the potential authorization of solar energy developments on previously undeveloped sites.*

BLM, the Department of Energy (DOE), and the State of California have all identified commercial-scale solar energy as an integral component of a future energy system which is sustainable, while reducing the emission of greenhouse gases. BLM ackowledges that locating commercial-scale solar energy facilities only on previously disturbed sites (public or private) would be desirable, and is following the developments associated with the recent initiative between EPA and the National Renewable Energy Laboratory (NREL) to encourage this type of renewable energy development. However, even with new federal initiatives to evaluate development of previously contaminated sites, BLM is still mandated to consider ROW applications on undisturbed public land. Also, given the large land area requirements and difficulty in acquisition of small land parcels, large-scale development on previously contaminated lands is potentially not feasible in the same time frame as that of the proposed project. Therefore, to access the innumerable benefits of solar energy, sites must be identified which meet a variety of technical and economic criteria (such as high solarity and particular slope and grade), and which also minimize impacts to environmental resources. Ultimately, this process requires consideration of sites that are either undeveloped, or which have limited development.

While BLM agrees that biological resources would be impacted in the proposed project, Mitigated Ivanpah 3 Alternative, and Modified I-15 Alternative areas, we also acknowledge the long history of human use and development of the Ivanpah Valley area, and the project site. The project site itself is currently the location of a grazing lease, and is traversed by transmission lines, a natural gas pipeline, and roads. The site is directly adjacent to a golf course. Within a few miles of the project site are an interstate highway, casino development, a natural gas power plant, and waste disposal facilities for the Molycorp mine. As part of its mandate to balance multiple use of public lands with environmental protection, BLM must consider all of these issues, and they are all presented as part of the analysis in the EIS.

2.2 Comments on the Range of Alternatives Considered

Comment ISEGS-8-2a: In this case, the BLM has considered only two alternatives, granting the right-of-way (the "proposed action") and not granting the right-of-way ("no action"). This is an entirely inadequate range of alternatives and violates both the letter and spirit of NEPA. This is especially so given the specific requirement to "Include reasonable alternatives not within the jurisdiction of the lead agency" since the CEC considers multiple alternatives in the associated FSA.

Comment ISEGS-6-8a: The DEIS presents only the Proposed Action Alternative and a No-Action Alternative. EPA believes that the alternatives analysis needs to be expanded in the SDEIS to include a full analysis of a reasonable range of alternatives.

Comment ISEGS-10-6: Despite its flaws, the DEIS reveals that this project will "have major impacts to the biological resources of the Ivanpah Valley, substantially affecting many sensitive plant and wildlife species" including the federally listed desert tortoise and a number of rare plants, as well as "eliminating a broad expanse of relatively undisturbed Mojave Desert habitat." DEIS at 1-17. NRDC and The Wilderness Society raised concerns about the propriety of this site in our comments on the CEC's Preliminary Staff Assessment as did many other organizations and individuals. As the result of its failure to consider any alternatives to the proposed project, the Ivanpah DEIS has only exacerbated those concerns. The BLM should issue a supplement without further delay that analyzes a reasonable range of alternatives and that corrects the DEIS' inadequate analysis of cumulative impacts.

Comment ISEGS-5-2: According to the DEIS, the purpose of the proposed action is to "approve, approve with modifications, or disapprove ROW applications filed by Bright Source." DEIS at 2-7 (emphasis added). It is the approve with modifications aspect of the above statement that gives rise to an expectation of a full range of Project alternatives in the DEIS. Yet, despite these obvious options, the BLM only considered two proposals: the right-of-way (the proposed Project) and denial of the right-of-way (no project alternative). DEIS at 4-1. It is entirely unclear how the BLM would impose modification to the Project absent a full discussion of such modifications in the DEIS' alternatives analysis.

The BLM did not provide a clear explanation as to why the DEIS lacked a meaningful range of alternatives, but as best as Sierra Club could discern the rationale went as follows: first, only the proposed Project and No Project alternatives were within the agency's jurisdiction; second, only those two alternatives met the Project objectives for purpose and need; and, third, "no other right-of-way application was brought forward by the applicant. " Id. As shown below, these explanations are not supported by fact or law. The BLM failed to inform the public and decision makers of a reasonable range of Project alternatives that were more protective of natural resources. This omission is a clear violation of NEPA.

Comment ISEGS-5-3: As the DEIS pointed out but then ignored, NEPA requires action agencies to develop and evaluate reasonable alternatives, including alternatives that are not even within the agency's jurisdiction, and are outside the applicant's ability to implement. DEIS at 4-1 citing CEQ's guidance NEPA 40 Most Asked Questions. Under CEQA, the CEC staff included a number of alternatives outside of federal jurisdiction and outside the applicant's ability to implement. NEPA required the BLM to complete a similarly broad analysis or adequately explain why other alternatives were rejected. It did neither.

An agency may not reject a reasonable alternative because it is "not within the jurisdiction of the lead agency." 40 C.F.R. § 1502.14(c); see also Muckleshoot Indian Tribe v. U.S. Forest Service, 177 F.3d 800, 814 (9th Cir. 1999). For example, an agency's failure to consider an alternative that would require some action beyond that of its congressional authorization is counter to NEPA's intent to provide options for both agencies and Congress. See Natural Res. Def. Council v. Morton, 458 F.2d 827, 836 (D.C.Cir.1972) ("The mere fact that an alternative requires legislative implementation does not automatically establish it as beyond the domain of what is required for discussion, particularly since NEPA was intended to provide a basis for consideration and choice by the decisionmakers in the legislative as well as the executive branch."). BLM was required to consider alternatives that would meet the Project's objectives of increasing generation of renewable energy while protecting sensitive biological resources on public lands even if those alternatives were beyond the BLM's immediate authority to implement.

With the approval of the ISEGS Project, the BLM will help facilitate the timely development of renewable energy, a national goal. DEIS at 2-8. Under NEPA, reasonable alternatives are defined by the scope of the problem addressed. Thus, projects dealing with national issues warrant a broad range of project alternatives. Natural Resources Defense Council v. Morton, 458 F.2d 82,7 836 (D.C. Cir. 1972) (EIS violated NEPA because it failed to consider alternatives outside of the Department of the Interior's jurisdiction) Here, a broad articulation of "reasonable alternatives" is compelled by the national scope of the articulated problem: "When the proposed action is an integral part of a coordinated plan to deal with a broad problem, the range of alternatives that must be evaluated is broadened." Id. at 835. Thus, as part of a coordinated effort to reduce the nation's dependence on fossil fuels, a problem of national scope, the BLM was required to consider solutions outside its jurisdiction. For

example, a reasonable scope of alternatives would include distributed energy generation, energy efficiency, private-land alternatives, reconfiguration, and other federal sites.

Comment ISEGS-5-5: As noted above, a proper alternatives analysis furthers NEPA's environmental policies by requiring agencies to consider whether they can carry out federal actions in less environmentally damaging ways, and consider whether alternatives exist that make the action unnecessary. Specifically, NEPA's regulations require an agency "to rigorously explore and objectively evaluate all reasonable alternatives." 40 C.F.R. § 1502.14. "An agency must look at every reasonable alternative, within the range dictated by the nature and scope of the proposed action." Northwest Environmental Defense Center v. Bonneville Power Admin., 117 F.3d 1520, 1538 (9th Cir.1997). "The existence of a viable but unexamined alternative renders an environmental impact statement inadequate." Morongo, 161 F.3d at 575; see also Resources Ltd. v. Robertson, 35 F.3d 1300, 1307 (9th Cir.1994). The BLM's failure to include other alternatives that might prevent or eliminate environmental damage in the Ivanpah Valley and meet most of the Project's objectives is a clear violation of NEPA.

Comment ISEGS-5-9: The DEIS omitted a full alternatives analysis on the grounds that the BLM only received one right-of-way application, and viewed its discretion as limited to simply responding to the right-of-way as written. DEIS at 4-1. Sierra Club fails to see how the application in this case differed from most other projects involving commercial development. In the normal course, applicants present the agency with a fixed proposal and the agency prepares a full analysis of the project's impacts and investigates various alternatives to the applicant's prepared plans. The fact that the applicant itself did not provide BLM with an array of alternatives has no bearing on the agency's statutorily mandated analysis. The BLM must now start over and consider a meaningful range of alternatives that meet federal objectives. Muckleshoot Indian Tribe v. USFS, 177 F.3d 800, 813 (9th Cir. 1999) (Forest Service violated NEPA by considering only no-action alternative and two other similar alternatives), See also Sierra Club v. Dombeck, 161 F.Supp.2d 1052, 1068 (D.Ariz. 2001) (EIS inadequate in part because of a failure to evaluate all reasonable alternatives). Each analysis must "[d]evote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits." 40 C.F.R. § 1502.14(b).

Comment ISEGS-7-1: The FSA/DEIS fails to analyze a reasonable range of alternatives, narrowly defining the project's objectives in such a way as to preclude assessment of many viable alternatives on private and degraded land.

Comment ISEGS-7-4: The FSA/DEIS's analysis of proposed project alternatives is insufficient and violates the National Environmental Policy Act ("NEPA"). Because the alternatives analysis is the "heart" of any environmental review, the failure to provide meaningful alternatives is fatal to this FSA/DEIS. Indeed, even the California Department of Fish and Game ("CDFG") noted that a "full analysis" of alternate sites was still lacking in the FSA/DEIS (CDFG comments on the Preliminary Staff Assessment, October 27, 2009, page 4). Unfortunately, rather than looking for

meaningful alternatives that avoid significant impacts to the desert tortoise and other biological resources, the Bureau of Land Management ("BLM") appears to have simply accepted the proponent's proposal and choice to build the proposed Project in "excellent tortoise habitat," with a low level of mitigation, a 3:1 ratio for impacts to 4,073 acres of high quality desert tortoise habitat, even where "lower quality habitat is clearly within range to potentially reduce the overall project impact to endangered and sensitive species." Id.

Comment ISEGS-3-5: NEPA requires the BLM to include a reasonable range of meaningful alternatives in its project EIS. Specifically, BLM must "study, develop, and describe appropriate alternatives to recommend courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." A full analysis of alternate siting scenarios is warranted for the Project given the potential conflict from developing renewable solar energy on intact desert public lands supporting imperiled plant and wildlife species. The Sierra Club believes such a conflict can be avoided in the Ivanpah Valley by situating the Project in a manner that completely avoids much of the highest quality desert tortoise habitat while keeping the Project at its proposed scale, thereby maximizing solar generation.

Comment ISEGS-2-36c: Based on this DEIS, the BLM's decision must he to deny the project as proposed. Because BLM stated that it was only providing "detailed analysis" for the proposed project and the no project alternative in the DEIS, the DEIS must be revised and re-circulated to comply with NEPA. Rather than rigorously exploring all reasonable alternatives, including alternatives that could avoid significant impacts to the desert tortoise and other biological resources, the BLM framed the analysis in the DEIS as being simply about the acceptance or rejection of the project as proposed by the applicant-by insisting on such a binary analysis BLM failed to fulfill its duties under NEPA, and without a revised DEIS BLM cannot lawfully approve the project.

Moreover, among the more protective alternatives that BLM rejected with little to no analysis are many that could avoid significant impacts of the project. These alternatives should be reassessed in light of the known impacts of the project. However, BLM failed to fully consider feasible alternatives that would avoid significant impacts of the project particularly the significant impacts to desert tortoise, its habitat, and other biological resources.

The FSA/DEIS examines and rejects a series of project alternatives that BLM had already determined would not meet its narrow statement of the purpose and need of the project in what appears to be an elevation of form over substance. Because the alternatives analysis is the "heart" of any environmental review, the failure to provide meaningful alternatives is fatal to this FSA/DEIS. Indeed, even the CDFG noted that a "full analysis" of alternate sites was still lacking in the FSA/DEIS. CDFG Comments dated October 27, 2009 at 3. As CDFG noted the proposed site is "excellent tortoise habitat, with a low level of disturbance and high plant species diversity," and suggested that alternatives should be evaluated where "lower quality habitat is clearly within range to potentially reduce the overall Project impacts to endangered and sensitive species." Id.

Comment ISEGS-8-1a: The proposed power plant project would be located on relatively undisturbed public lands in California that are habitat for the state and federally listed desert tortoise, and that provide habitat for rare plant species and communities. The proposed project will have significant direct, indirect and cumulative impacts on desert tortoises, rare plants, and visual resources. The BLM fails to consider and analyze alternatives that would allow the project to proceed without impacting desert tortoises, rare plants, and visual resources. As we discuss below, BLM's documentation of the impacts of the proposed action is inadequate.

Response: *In Section 4 of the DEIS, BLM conducted a screening-level evaluation of 23 potential alternatives to the proposed action, including alternative locations, configurations, and technologies, including several alternatives (Private Land, Distributed Generation) that are not within BLM's scope of authority. The evaluation of several of these alternatives included not only a determination of their technical and economic feasibility, but a resource-by-resource evaluation of their potential impacts. Although only the proposed action and No Action Alternative were carried into the resource sections for a more detailed analysis, the evaluation of potential alternatives to identify those which were technical and economically feasible, and which could have a reduced magnitude of environmental impacts, exceeded the level of analysis usually included in a screening-level analysis.*

Following review of the public comments, BLM reviewed the rationale presented in Section 4 of the DEIS for eliminating these 23 alternatives from detailed evaluation, and, for 21 of them, concluded that the rationale for their elimination from detailed analysis was explicitly provided, and was sound. However, the agency determined that two alternatives which had been analyzed but eliminated from further evaluation, the I-15 Alternative and the Reduced Acreage Alternative, were potentially feasible, and therefore merited more detailed evaluation. As a result, BLM published the SDEIS on April 16. The SDEIS presented a detailed, resource-by-resource evaluation of a version of the I-15 Alternative (called the Modified I-15 Alternative), and a reduced acreage alternative (called the Mitigated Ivanpah 3 Alternative).

Finally, in the review of the public comments, BLM noted two additional alternatives (Ivanpah Playa and Phased Approval) that were not originally included in the screening analysis in Section 4 of the DEIS. Because both of these alternatives recommended in the public comments have merit, they have been added to the revised screening analysis in Section 4 of the FEIS.

2.3 Comments on Other Potential Alternatives

Ivanpah Playa:

Comment ISEGS-8-2b: Because of the scale of the project it is unlikely that minor changes in footprint would reduce the direct, indirect, and cumulative effects of the project to less than significant. Neither the BLM nor the CEC considered alternative

sites that would avoid significant impacts to desert tortoise but that would allow the project to proceed. One such location within the immediate project vicinity that would avoid desert tortoise habitat is Ivanpah Dry Lake bed. This alternative site location was raised at public meetings, was proposed by the Sierra Club in its June 22, 2009 letter, was referenced by CDFG in its October 27, 2009 letter, and should have been considered in the FSA/DEIS. While construction of the power plant at this site may require some additional engineering to accommodate flooding, the lake bed is crossed by both a freeway (I-15) and a power line so such accommodation is clearly possible. There are proposals to locate solar power plants on and adjacent to dry lake beds in other areas of the CDCA. Locating the power plant on the lake bed by the state line would minimize impacts to visual resources since it would be closer to existing developments, would avoid desert tortoise habitat, and would avoid impacts to rare plants. Restoration of the dry lake bed would likely be much easier once the plant is decommissioned. The lake bed covers 35 square miles and provides ample space to accommodate existing recreational uses and the proposed ISEGS project. The BLM should consider this alternative in a supplemental draft EIS.

Interstate 15 (including Designation of ACEC and Retirement of Grazing):

Comment ISEGS-3-1: We request that the BLM include an EIS alternative that (1) relocates the Project's three power blocks closer to the areas adjacent to Interstate 15 currently mapped as translocation sites; (2) leaves the desert tortoise undisturbed and designates its habitat at Ivanpah as an area of permanent protection such as that provided by areas of critical environmental concern (ACEC); and (3) retires the Clark Mountain grazing allotment.

Comment ISEGS-3-3: The BLM should include in the EIS an analysis of designating the portions of Ivanpah Valley currently proposed for development as Ivanpah 2 and 3 as areas of critical environmental concern. The Sierra Club seeks permanent protection for these lands because a reconfiguration of the Project footprint only makes sense if the habitat protected by the change remains off limits to development permanently.

Comment ISEGS-3-4: Finally, the BLM should retire the Clark Mountain grazing allotment as a component of the ACEC designation. Grazing is simply not compatible with protecting wildlife and plant species in the Ivanpah Valley. This particular allotment is rarely used based on the records at the Needles Office. Those records reveal that no animal unit months were billed for the allotment from 2007 to 2009 (to the end of March). And it appears from the Moon's letter of September 4, 2008 to Sterling White of the Needles BLM office that the permit holders are willing to accommodate a retirement of the allotment were the BLM to issue a right-of-way in connection with the Project.

Comment ISEGS-5-6: In June, 2009, the Sierra Club provided the BLM with a Project alternative that would allow the full 400 MW project to go forward on schedule, while avoiding the most significant impacts on desert tortoise. . . . Based on these and other facts, the Sierra Club formally requested that the BLM include a NEPA alternative that would analyze relocating the Project closer to the areas adjacent to Interstate 15, lands

mapped as Desert tortoise translocation sites until it was determined these were largely unsuitable for that purpose. Inexplicably, the BLM never responded to the Sierra Club letter and certainly did not include it or any variation of the conceptual alternative in the DEIS. Nor did it explain why this alternative was unsuitable for a ROW or CDCA plan amendment.

Comment ISEGS-5-7: Not only did the DEIS omit a viable alternative, as discussed in section III below, it also failed to explain how translocation would protect Desert tortoise. Indeed, the DEIS is silent on how the agencies will resolve the uncertainties associated with translocating desert tortoises. Without details on how the translocation plan will differ from other plans (which resulted in high levels of mortality), or even the locations where tortoises will be released, translocation cannot be considered a viable form of mitigation for the Project. The Sierra Club's alternative proposed avoidance over highly risky mitigation in the form of translocation.

Since June 2009, additional scientific information generated in the Energy Commission proceeding lends additional support to moving the Project to degraded lands adjacent to I-15 and away from the upper reaches of the valley. New information shows that reconfiguring the Project, especially moving all of Ivanpah 3 closer to I-15 would reduce the need to translocate Desert tortoise. In support of reconfiguration, Sierra Club's expert, biologist Scott Cashen, reviewed the literature, the Energy Commission docket and all of the testimony from the evidentiary hearings. Based on this information, Mr. Cashen identified a more than 3,000 acre parcel of land adjacent to I-15 unsuitable as Desert tortoise habit but suitable for portions of the ISEGS Project. See attached Letter From Scott Cashen to Gloria D. Smith, Sierra Club (February 10, 2010) at Figure 1.

In support of Project reconfiguration, Mr. Cashen submitted substantial evidence to the Energy Commission supporting the hypothesis that certain lands near I-15 support fewer desert tortoises than the proposed Project site. See Mr. Cashen's Expert Testimony attached here. Because there were no recent desert tortoise surveys for the lands adjacent to I-15, Mr. Cashen led a field study specifically designed to test the hypothesis that tortoises were less abundant near the Interstate than at the Project site. Desert tortoises were hibernating in December when he conducted his survey, so he carefully surveyed tortoise burrows as an index of relative abundance. Mr. Cashen collected data from both sites (i.e., Project and I-15), then used statistical analysis to determine if there was a significant difference between the number of desert tortoise burrows between the two sites. See Mr. Cashen's Letter.

Mr. Cashen determined that burrow density at the Project site was more than double that of the I-15 Alternative sites he surveyed (0.67 burrows/mile on the Project site, and 0.30 burrows/mile on the I-15 site). The difference was statistically significant at $P < 0.01$). Mr. Cashen's results are comparable to those reported by other Desert tortoise experts.

In addition, lands adjacent to I-15 were originally proposed for translocation areas for tortoises cleared from the Project site. It is unclear what the status of that plan is now.

However, at the request of the CDFG and the CEC staff, the applicant conducted vegetation sampling at several sites proposed for desert tortoise translocation. Results of those surveys support the Sierra Club's alternative to reconfigure the project. Specifically, the surveys indicated that approximately half of the sampling locations in the vicinity of I-15 had plant species richness too low to be viable for desert tortoises (CDFG's criteria for translocation sites requires a comparable ecological make up to habitat where the tortoises currently reside). Therefore, lands adjacent to I-15 lacked enough plant diversity to support desert tortoise.

Comment ISEGS-3-2: In a May 13, 2009, Energy Commission filing, the Western Watersheds Project presented evidence showing how the areas along Interstate 15, currently proposed as tortoise translocation areas 1 and 2, have historically supported few desert tortoises. In that filing to the Energy Commission, Western Watersheds Project provided survey data from Kristin Berry estimating tortoise density in the Project footprint in the range 50-100 desert tortoises per square-mile; whereas the low lying areas along Interstate 15 supported approximately 20-50 desert tortoises per square-mile or less than half.

It is clear that the lands near Interstate 15 have served as a major sink for tortoises, depleting nearby populations, either as a result of cars colliding with tortoises, predation or possibly due to truck- and automobile related pollutants in the soil, or all three factors. Translocating the listed tortoise to sites known not to support them simply makes no sense. Even a casual inspection of the Project site and the translocation areas shows that the native plant life at the Project site is much more extensive and varied than at the translocation lands. The areas currently designated as Ivanpah 2 and 3 provide the highest quality tortoise burrowing habitat and food sources. In contrast, due to the dirt road paralleling Interstate 15, and the grazing operations in and around the corral adjacent to the highway, the translocation lands are denuded and contain exotic plants. In short, completely avoiding habitat lands eliminates translocation, thereby, avoiding the Ft. Irwin pattern of desert tortoise mortalities. It is well established that desert tortoise translocation results in very high mortality.

Similarly, there are approximately 2,000 ephemeral washes that occur throughout the project site. The lower elevations adjacent to the highway present far fewer drainage challenges because of the reduced slope. Relocating the three power blocks to the lower elevations would reduce or eliminate drainage issues that arise with heavy rains.

The Sierra Club's Project alternative stems from a deep concern for the remaining tortoises in the California portion of the Northeastern Mojave Desert Tortoise Recovery Unit. This particular unit is one of six recovery units designated in the U.S. Fish and Wildlife Service's recovery plan. Because the Mojave Desert tortoise is listed as a threatened species under state and federal law, and because the entire California population of this particular unit is found within the Ivanpah area, protecting these individuals must be a high priority for all of the approving agencies, including the BLM. A simple reconfiguration of the Project along with an ACEC designation for the most

densely populated portions of Ivanpah Valley would significantly protect this recovery unit, and stands to facilitate timely resolution of Project approval.

Comment ISEGS-7-7: The BLM rejected a proposed project reconfiguration submitted by the Sierra Club as an alternative, stating very generally that impacts would not be reduced. BLM failed to provide any meaningful analysis and simply glossed over what were some significant differences in impacts to biological resources between the I-15 alternative and the proposed project site. Surveys conducted by the project proponent in 2007 identified less desert tortoise within the I- 15 reconfiguration area than on the proposed project site. However, protocol desert tortoise surveys were not conducted for the I-15 alternative site (FSA/DEIS, page 4-44).

Comment ISEGS-4-1: My comments are directed specifically at the Bureau of Land Management's (BLM) analysis of project alternatives, and the failure of the BLM to examine an alternative, that in my professional opinion, would have considerably less of an impact on the desert tortoise (Gopherus agassizii) and other sensitive biological resources…

The comments contained herein are based on my knowledge and experience, my review of environmental documents pertaining to the Project, a site-specific field study, and the testimony presented at the Project evidentiary hearings. The information gathered from these sources has led me to the following conclusions:

1. The Project would have a significant adverse impact on the State and federally threatened desert tortoise and several special-status plant species.
2. The DEIS failed to analyze a proposed project alternative that would have greatly reduced impacts on sensitive biological resources, including the desert tortoise.
3. There is substantial evidence that reconfiguring the proposed Project closer to Interstate 15 would greatly reduce Project impacts on the desert tortoise and other sensitive biological resources.
4. The conclusions reached by a California Energy Commission (CEC) biologist were based on a hastily conducted qualitative analysis. Upon review of this biologist's conclusions, it should be clear to any trained scientist that the conclusions were unsupported, and thus, invalid. In the subsequent sections I provide more specific discussion of the factors that led me to these conclusions.

Comment ISEGS-4-3: On June 22, 2009, the Sierra Club submitted a letter to the BLM asking the BLM to analyze an alternative project configuration that relocated the Project closer to I-15. The Sierra Club letter contained several scientifically valid reasons why the BLM should consider the proposed alternative. These included (a) empirical data indicating the proposed Project site contained more than twice the density of desert tortoises as the proposed alternative site; and (b) information on the adverse effects roads (e.g., I-15) are known to have on desert tortoise populations. The DEIS failed to analyze the Sierra Club's proposed alternative, or any alternatives besides the "Proposed Project" and "No Project" alternatives. Nevertheless, from a biological resources perspective the "Sierra Club Alternative" would have less severe impacts at

all levels of analyses. However, if only the "Proposed Project" and "No Project" alternatives are available for consideration, in my professional judgment, the BLM must eliminate the Proposed Project alternative from consideration due to the significant adverse effects it will have on the desert tortoise and other sensitive biological resources and habitat.

Comment ISEGS-4-4: Basic principles of conservation biology and landscape ecology support the conclusion that the Sierra Club Alternative would not have the same ecological system level impacts as the proposed Project site, and that the Alternative's impacts to individual plant and animal species would be less severe that the proposed Project. Habitat fragmentation, community-level disturbance, edge-effects, and introduction of exotic species are all known threats to the long-term viability of many plant and animal species. With respect to the desert tortoise, Boarman (2002) conducted a thorough review of the literature and concluded that fragmentation, loss of habitat, and habitat alteration can result in habitat being largely useless to tortoise populations.

Each of these ecological concerns would be greater at the proposed Project site than at the Sierra Club Alternative. This conclusion is not debatable; it's obvious. Because the Sierra Club Alternative is located nearer to the Interstate and the Primm Valley Golf Club, it would result in less habitat fragmentation, community-level disturbance, and edge-effects than the proposed site. Similarly, roads and anthropogenic disturbance are known vectors for invasive plant and animal species; locating the Project adjacent to existing roads and disturbance (i.e., the golf course) would minimize the adverse effects associated with invasive species. The DEIS acknowledges these ecological concerns, but fails to consider the viable, proposed alternative that would clearly alleviate them.

Comment ISEGS-4-8: The proposed Project would have a significant impact on the desert tortoise population. After viewing and reviewing all of the available testimony, and other evidence, I have concluded that the Project could be reconfigured to have considerably less impact on the Ivanpah Valley's desert tortoise population. My conclusion is supported by my examination of site conditions, the testimony provided by the experts, and the scientific literature.

Figure 1 depicts land suitable for Project reconfiguration such that it would reduce impacts on desert tortoises and desert tortoise habitat. The land depicted in Figure 1 contains approximately one-half the density of desert tortoises as the proposed Project site. Furthermore, it encompasses land known to provide lower value to the desert tortoise due to its proximity to I- 15, the golf course, and other types of anthropogenic disturbance. These considerations are particularly important to the long-term recovery of the species. "High quality" habitat provides little value to recovery if it is not suitable for long-term occupation. As desert tortoise expert Dr. Ron Marlow stated in his testimony, "lots of really good potential habitat is not occupied by tortoises because of the impacts of the existing road." The proposed alternative site encompasses such habitat.

Comment ISEGS-4-9: The land depicted in Figure 1 excludes the 1000-foot Caltrans ROW for the Joint Point of Entry and a 0.25-mile ROW for the Los Angeles Department of Water and Power. It encompasses approximately 3,072 acres of land adjacent to anthropogenic disturbance and known to have low plant species richness. Overall, the location occupies the lower elevation region that has lower species diversity. From an ecological perspective, these lands would aggregate anthropogenic disturbance, and thus reduce the many indirect Project impacts (e.g., fragmentation, invasive species, edge-effects) on the desert tortoise. These lands should be used to reconfigure the Project closer to I-15.

Finally, through our discussions, I understand the applicant is proposing to avoid direct impacts to a strip of land along the northernmost portion of Ivanpah 3. This proposed reduction would do very little to reduce impacts to the desert tortoise, and it would do virtually nothing to ameliorate the long-term impacts of the Project on the local tortoise population. This is because a reduction of Ivanpah 3 would not reduce habitat fragmentation, edge effects and ecological disturbance. These conclusions are supported by both the record and the scientific literature. In my professional opinion, the only meaningful (and currently viable) alternatives to reducing Project impacts to desert tortoise are the No-Project alternative and a Project reconfiguration which utilizes the land depicted in Figure 1.

Comment ISEGS-4-10: Between January 11 and 14, 2010, the California Energy Commission held evidentiary hearings on the application to construct and operate the ISEGS Project. With respect to desert tortoise impacts and protection, and Project alternatives, all of the experts that testified either directly or indirectly, supported the conclusion that the Sierra Club Alternative would have less of an impact on sensitive biological resources. This includes the experts presented by the applicant, agencies, and intervenors.

1. Mark Cochran and John Cleckler (applicant experts) testified that the margins of residential areas serve as a population sink to desert tortoises due to off-road activity, non-native predators, and a "number of different factors." They further testified that collection of tortoises by humans has an adverse effect (tortoise collection frequently occurs along roadways).
2. Dr. W. Geoffrey Spaulding (applicant expert) testified that human caused edges (i.e., "edge effect") and human activity have a deleterious effect on tortoise populations. Dr. Spaulding further testified that human development results in additional predators (e.g., common raven) in desert tortoise habitat.
3. Dr. Michael Connor (Western Watersheds Project) testified that roads act as a sink to desert tortoise populations, resulting in fewer tortoises in the vicinity of roads.
4. Dr. Ron Marlow (Defenders of Wildlife) testified that I-15 creates a significant impact on desert tortoises, and that "lots of really good potential habitat is not occupied by tortoises because of the impacts of the existing road." Dr. Marlow testified that the impact can extend out to five kilometers from the road, and that the proposed Project location would further divide habitat. Dr. Marlow stated that

the effect of losing habitat connectivity is fairly direct. Dr. Marlow concluded that linear impacts are more pervasive than very localized impact, and that "placing two linear impacts up against each other would make more sense" because it reduces the edge over which that impact is expressed in the population.

5. Mark Jorgensen (Center for Biological Diversity) testified that the "obvious thing" to reduce impacts to bighorn sheep was to locate the Project further downslope in a more "impacted zone down near the freeway."
6. Dr. Susan Sanders (CEC staff) testified that her conversations about desert tortoise with experts at BLM and the Fish and Wildlife Service "all pointed to I-15 as being a problem with fragmentation." Dr. Sanders further testified that I-15 creates a problem to tortoise movement and habitat connectivity and that "there's a problem with mortality from I-15." Dr. Sanders stated one of the most substantial effects of the Project on desert tortoise is loss of about 4,000 acres of occupied habitat, and fragmentation and disturbance to the adjacent habitat.
7. Carolyn Chainey-Davis (CEC staff) testified that a mitigation technique agencies typically "love to see and push for" is one that maintains intact functioning ecosystems. Consequently, Ms. Chainey-Davis concluded the CEC needs to maybe re-examine a reconfigured footprint or reconfigured alternative.
8. Dr. Andrew Sanders (applicant/U.C. Riverside Herbarium) testified that moisture was the limiting factor for the special-status plants that occur at the Project site. He stated that, in general, as elevation drops (e.g., towards the Interstate), the temperature increases and the amount of rainfall declines (therefore the water availability is greater up slope).
9. Scott Flint (CDFG) testified that for mitigation, the Department seeks large, contiguous, easily manageable and defensible tracts of land; as well as lands that are near core populations or provide connectivity.
10. Richard Anderson (CEC staff) testified that he agreed (a) quantitative data is better than qualitative data; (b) an assessment of actual occupancy and figuring out where the animal occurs is better than humans trying to predict where that animal might occur; (c) that there are ecological principles, such as fragmentation and maintenance of large blocks of habitat that are important to maintaining intact ecosystems; and (d) studies of desert tortoises have shown that roads are a sink for tortoises, and that they have an adverse effect (on tortoise populations).

None of the above experts refuted any of the preceding testimony, nor did they discuss any alternative viewpoints with one exception. The only variation in the extensive evidence showing that locating the Project adjacent to disturbed land (e.g., the Interstate and golf course) came from Energy Commission staff biologist Richard Anderson. Mr. Anderson concluded that there is very little difference in value for desert tortoise and other special-status species between the proposed Project site and "I-15 alternative" site. Mr. Anderson's conclusion contradicted established principles of conservation biology and the published work from dozens of desert tortoise researchers. More important, it contradicted the site-specific habitat assessment conducted by the applicant's biological resource consultants, and my site-specific study

that documented a significantly greater density of desert tortoises at the Project site than at the lands occupied by the I-15 Alternative.

Mr. Anderson's conclusion contradicted the testimony of the numerous experts presented by both the applicant and the intervenors at the Energy Commission's evidentiary hearings. Finally, Mr. Anderson's conclusion contradicted his own testimony, in which he stated he agreed that roads are a sink for desert tortoise, thereby adversely effecting desert tortoise populations overall. Mr. Anderson's conclusion is so significantly flawed it warrants further discussion. In my opinion, Mr. Anderson's conclusions are scientifically invalid and should not be a component of the BLM's supplemental alternatives analysis for the DEIS.

Significant flaws with Mr. Anderson's conclusion include:

1. Mr. Anderson testified that he sampled 11 variables across 7,128 acres (i.e., the area occupied by the two sites) in a single day in August. In my opinion, it would be impossible to collect reliable data or conduct a representative sample in such a short timeframe.
2. Mr. Anderson acknowledged that he did not collect any quantitative data. Rather, he "eyeballed" the two sites and used subjective factors to create numerical scores for habitat value. This type of data is considered unreliable. Mr. Anderson's data supports this assertion. For example, for the variable "Quality of Surrounding Habitat", he provided every sampling site with the highest possible score of "3". He defines a "3" as high quality habitat with "little to no fragmentation, no nearby development, low or no recent grazing, and little human activity." The I-15 site is adjacent to Interstate 15 and a golf course. How then can one consider it to have little to no adjacent fragmentation, no nearby development, and little adjacent human activity?
3. Even the qualitative variables Mr. Anderson collected have little relevance to desert tortoise habitat quality. Instead of collecting information on variables that have been shown to be statistically significant predictors of desert tortoise habitat quality, Mr. Anderson collected information on variables such as "Special Status Species Likely" and "Overall Habitat Quality for Wildlife". These variables are irrelevant to the desert tortoise. In reference to use of indirect variables to measure habitat, Morrison (2006) states: "[m]any indirect measurements in the same analysis thus greatly compound the error in the results, making for weak conclusions."
4. The variables Mr. Anderson used are plagued by extreme co-linearity (i.e., two or more highly correlated variables), yet he treated them as independent. For example, how can the variable "Overall Habitat Quality for Tortoise" be used to evaluate "habitat quality for desert tortoises" (i.e., the purpose of his assessment)? As a result of this co-linearity, Mr. Anderson violated basic statistical procedures.
5. Annual plants are known to be an important and preferred component of the desert tortoise diet. Arguably, sites with abundant and diverse annual plants provide higher "quality" habitat than those that do not. The USGS habitat model

that was submitted as an exhibit to the evidentiary hearings includes annual plant growth potential as a significant predictor of desert tortoise habitat potential. However, Mr. Anderson's assessment of habitat quality did not include a measure of annual plant cover, or even growth potential (as is used in the model).

6. Mr. Anderson assigned equal weight to each variable to derive a total score for each site. It's well known that two variables rarely have an equal effect on an organism. By assigning each variable equal weight, Mr. Anderson inherently produced unreliable results.
7. Mr. Anderson failed to establish a link between any of the variables he "measured" and desert tortoise habitat quality. That is, he never established whether shrub density (used to evaluate the variable "Dominant Shrubs") provides high quality habitat (e.g., in the form of escape cover) or low quality habitat (e.g., due to competition with annual plants), and that his rationale is supported by scientific literature.

Comment ISEGS-4-12: The DEIS demonstrates that Project objectives could be maintained by a reconfigured design. All available evidence supports the conclusion that adopting a reconfigured design that includes the lands depicted in Figure 1 would reduce impacts on desert tortoise and other sensitive biological resources. The BLM should incorporate careful review of this alternative in a revised DEIS.

Comment ISEGS-2-36f: The Sierra Club also sponsored testimony regarding the potential for a reconfigured alternative closer to the 1-15 that might have less impacts on occupied desert tortoise habitat. None of these alternatives were fairly analyzed in the DEIS.

Comment ISEGS-5-14: The Sierra Club, members of the public, other environmental organizations, and various biologists for agencies and the applicant have, combined, provided overwhelming evidence showing that the Project would present detrimental if not devastating impacts on the federally listed Desert tortoise population in the Ivanpah Valley. Nevertheless, these comments show that the BLM may still issue a right-of-way that would allow the Project to generate all 400 MW of renewable energy and still avoid the most severe impacts on the Desert tortoise and other rare and sensitive desert species. Simply put, the BLM must reconfigure the Project adjacent to I-15. Therefore the Sierra Club respectfully requests that the BLM revised and recirculate the DEIS consistent with these comments or reject the ROW application. Thank you for your consideration.

Comment ISEGS-35-1: I have heard about BrightSource Energy's application to construct a utility-grade solar facility on more than 4,000 acres of ecologically sensitive lands in the Ivanpah Valley, and I'm concerned that if it proceeds as planned, it could push the endangered desert tortoises that live there even closer to extinction. The California Energy Commission concluded that this project "would have major impacts to the biological resources of the Ivanpah Valley, substantially affecting many sensitive plant and wildlife species and eliminating a broad expanse of relatively undisturbed

Mojave Desert habitat." The stretch of the Mojave where BrightSource wants to build its 400-megawatt solar power plant is spectacular and almost totally pristine. If the company were to move its project closer to Highway 15, BrightSource could dramatically reduce the negative impacts of the project on the desert tortoise -- and its sensitive habitat in the Ivanpah Valley. For this important reason, I urge you to consider examining an alternative project location that is closer to Highway 15. Decisions about how to "do" renewable energy will have long-term -- and potentially irreversible -- consequences for California's desert wildlife and ecosystems.

Comment ISEGS-5-10: If, the BLM remains unwavering in its position that only the Project and No-Project alternatives are required, it must dismiss the application based on the overwhelming evidence that the Project's impacts to Desert tortoise cannot be mitigated to an acceptable level. See Mr. Cashen's Letter. If on the other hand, the agency supplements the EIS' alternatives analysis, it must look at alternatives that actually avoid or reduce impacts to desert tortoise and other sensitive plant and animal species' habitat.

The Sierra Club understands that the Project applicant intends to offer a minor Project revision that would slightly reduce the northern and western boundaries of Ivanpah 3. There is universal agreement that Ivanpah 3 would fragment habitat and severely impact desert tortoise. Thus a reduced Unit 3 would simply result in less renewable energy production while still permanently destroying important desert tortoise habitat on public land. BLM should not waste resources analyzing an alternative that would do little to avoid the Project's most severe impacts on desert tortoise and its habitat and reduce power generation. It makes no sense for BLM to undertake a separate analysis of an alternative that is "not significantly distinguishable from alternatives actually considered, i.e., the proposed Project, or which have substantially similar consequences." Westlands Water District v. U.S. Dept. of Interior, 376 F.3d 853 at 868 (9th Cir. 2004). Reconfiguring the Project so that all or most of it is developed on fragmented and disturbed land adjacent to I-15 achieves all of the Project's objectives. Based on all of the evidence, including that in the next section, small adjustments to the Project footprint will still require translocation, an unnecessary and unacceptable method of mitigating impacts to listed Desert tortoise.

Comment ISEGS-26-2: Over the large fan dissected by numerous washes, grazing impacts appeared to be low. Big galleta grass (Hilaria rigida) was common and mostly ungrazed during all visits, some bunches with light utilization. Only one in ten grass bunches appeared to be used. Browsing on shrubs also appeared light. Trampling of the ground was light, and much cryptobiotic crust existed abundantly on inter-wash fan surfaces. Introduced weeds were rare, with some Splitgrass (Schismus sp.) in areas of the fan, amounting to less than 10% cover. Small amounts of Red Brome (Bromus madritensis ssp. rubens) was only found on hillsides near to Primm. Bush muhly (Muhlenbergia porteri), a highly palatable and sought-after forage to livestock, was present, indicating the area is not overgrazed. Fluffgrass (Erioneuron pulchellum) was common in places on the fan and hills, a valuable Desert tortoise (Gopherus agassizii) food, and the grasses did not appear to be grazed.

The area along I-15 in the southwest part of the valley had some burro dung (in the higher fan near the mountains) and abundant cattle tracks, trails, and dung lower in the valley. This area was heavily impacted by the cattle in the lower valley around a corral and old water tank-trough. Here trampling and overgrazing was evident from cattle; no burro sign was seen in this part.

Some grazing and trampling was present within two miles of Primm north of the ISEGS site.

Comment ISEGS-4-5: There is undisputed evidence that roads have an adverse effect on tortoise populations. These adverse effects have been well documented, thus making it clear that the Sierra Club Alternative would have less of an impact on desert tortoises than the proposed Project site. Road kill is considered a significant source of mortality to desert tortoises. Boarman and Sazaki (1996) reported a conservative estimate of one tortoise killed per 3.3 km (2 mi) of road surveyed per year. A common mitigation for the impacts of roads and highways is a barrier fence, which has been shown to be highly effective at reducing mortality in tortoises and other vertebrates in the west Mojave. However, fences only increase the fragmenting effects of roads on habitat. Preliminary results of an eight-year study indicate that culverts are used by tortoises to cross highways, but it is unknown whether their use is sufficient to ameliorate the fragmenting effects of fenced highways.

In addition to direct mortality, roads and highways are believed to have several indirect effects on tortoise populations. Habitat fragmentation by satellite urbanization and high-density highways (e.g., I-15) may be preventing essential desert tortoise metapopulation processes and, ultimately, species recovery. The presence of roads and highways may lead to increased predation on desert tortoises (and other species) by providing a travel corridor and reliable food source. For example, common ravens, which are predators on juvenile tortoises, are known for cruising road edges.

Roads and highways are a vector for introduced plant and animal species, which may affect desert tortoises and other native species in adjacent areas. Other potentially harmful activities that likely occur in greater numbers near roads include: mineral exploration, illegal dumping of garbage and toxic wastes, release of ill tortoises, vandalism, handling and harassing of tortoises, illegal collection of tortoises, and anthropogenic fire.

The numerous direct and indirect adverse effects of roads and highways may deplete desert tortoise populations two miles or more away. Research studies conducted by Boarman and Sazaki (2006); Nicholson (1978); Von Seckendorff Hoff an Marlow (1997); and other researchers have detected a statistically significant relationship between road distance and presence of desert tortoise sign. In sum, numerous studies have demonstrated roads and highways have several adverse impacts on desert tortoise populations. Many of these impacts result in habitat degradation, which may significantly reduce habitat quality for tortoises. The cumulative effects of habitat loss

and degradation have been implicated as causes in the extirpation and drastic reductions in tortoise populations in several locations.

More specific to the Ivanpah Valley, the results of several research studies, and our site-specific data, suggest I-15 has adverse effects on the local tortoise population. The proposed Project location would contribute to the cumulative effects of these adverse effects; it conflicts with principles of conservation biology; and it is in direct opposition to the Desert Tortoise Recovery Plan. Therefore, it is my professional opinion that there is ample evidence suggesting locating the Project adjacent to the Interstate would cause less impacts to the desert tortoise (and other sensitive wildlife) than the currently proposed location.

Comment ISEGS-4-7: In proposing its alternative, the Sierra Club provided credible evidence supporting the hypothesis that the land near I-15 supports fewer desert tortoises than the proposed Project site. However, recent desert tortoise surveys had not been conducted for the lands adjacent to I-15, and thus the hypothesis was untested. As a result, I led a field study that was specifically designed to test the hypothesis that tortoises were less abundant near the Interstate than at the Project site. Because desert tortoises would have been hibernating at the time of the study, I used the presence of tortoise burrows as an index of relative abundance. I collected data from both sites (i.e., Project and "I-15"), then used statistical analysis to determine if there was a significant difference between the number of desert tortoise burrows between the two sites.

Burrow density at the proposed Project site was more than double that of the I-15 site (0.67 burrows/mile on the Project site, and 0.30 burrows/mile on the I-15 site). The difference was statistically significant at $P < 0.01$). My results are comparable to those reported by Berry (1984), in which she reported tortoise density estimates in the Project area to be slightly more than double that of lower lying habitat along I-15 (50- 100/sq mile versus 20-50/sq mile, respectively).

Reduced Acreage/Reconfiguration:

Comment ISEGS-6-9a: We recommend that the SDEIS include a full analysis of the Reduced Acreage alternative to provide a comparison of environmental and economic impacts to inform decision making. We also encourage a full analysis of an alternative that combines a Reduced Acreage on-site alternative with renewable energy production off-site on disturbed lands in order to maximize energy efficiencies while minimizing environmental impacts.

Comment ISEGS-5-8: Finally, the ISEGS Project is comprised of approximately 200,000 individual and relatively small heliostats configured around centralized power towers that ultimately feed into the three main power blocks. DEIS at 3-6, 7; see also Figure 3 to Project Description. Given that the Project is actually three individual projects comprised of smaller individual components (unlike a large fossil fuel plant or large hydropower dam), there is inherent flexibility in the final configuration of the

heliostats and powers towers. Moreover, the Project's three separately-owned developments all have separate power purchase agreements with different utilities and separate start up dates. California Energy Commission Evidentiary Hearing, Testimony of John Woolard, January 12, 2010 at pp. 152-53. Consequently, the Project's configuration is sufficiently flexible to analyze a suite of alternatives that meet all of the Project's objectives.

Comment ISEGS-31-3: The Applicant has assisted the BLM and the CEC in the development of possible alternatives to be considered as part of the environmental review process. The Applicant, since the publication of the FSA/DEIS, has continued its efforts to reduce the environmental impacts of the project to the extent practical. The Applicant is submitting, as an attachment to these comments, the Mitigated Ivanpah 3 proposal designed to reduce impacts to the most sensitive biological areas currently included in the FSA/DEIS preferred alternative.

The Mitigated Ivanpah 3 proposal would substantially reduce the footprint of the Ivanpah 3 unit, by about 433 acres, completely avoiding a portion of the northernmost site. Mitigated Ivanpah 3 has the distinct advantage of being located entirely within the existing project site, meaning that the entire Mitigated Ivanpah 3 area has already been closely scrutinized and surveyed for desert tortoise, rare plants, and other biological resources by biologists and botanists, and has had equally stringent review by hydrologists, geologists, and other experts familiar with the extensive work performed on the site.

While the Applicant continues to
believe that the impacts associated with the nominal 200 MW Ivanpah 3 solar plant arrangement are reduced to a level of less than significant with the mitigation proposed in our testimony, the Mitigated Ivanpah 3 configuration would provide numerous additional environmental benefits, and would further avoid and minimize potential impacts. Among the more important benefits, the Mitigated Ivanpah 3 configuration would:

- Further avoid and minimize potential impacts to rare plants by completely avoiding the most densely populated plant communities in the northernmost portions of Ivanpah 3
- Further avoid and minimize potential impacts to desert tortoise, reducing the total tortoise relocation by approximately 15 percent, and providing additional area for relocation that is within the home range of the tortoise, that has a high density or rare plants and that intervenors believe has comparatively high habitat value.
- Further avoid and minimize the potential impacts to a significant number of large ephemeral washes located in the northernmost portions of Ivanpah 3, helping the project meet its Low Impact Design (LID) objectives by allowing stormwater to flow through the project.
- Further avoid and minimize potential impacts to the project areas that would have required the most grading and large rock removal, reducing the area requiring grading by 88 percent.

- Further avoid and minimize the potential Visual Resources impacts associated with glare and reflectivity by reducing the number of power towers in Ivanpah 3 from five to just one tower, and for the entire project from seven to three towers
- Further avoid and minimize the potential Visual Resources impacts associated with glare and reflectivity by reducing the number of heliostats by approximately 45,000.
- Reduce the northernmost portion of the site by 433 acres (approximately 23.6 percent of the present Ivanpah 3 configuration), and the overall footprint of the Ivanpah project by about 12 percent.
- Increase the distance between the site and the mountain range to the north and increasing potential foraging area for various species.

There are, of course, tradeoffs associated with the Mitigated Ivanpah 3 configuration. Most notably, the Mitigated Ivanpah 3 configuration would result in a capacity reduction of the nominal 200 MW that is currently proposed for Ivanpah 3. While the Applicant may be able to make up some of the lost capacity by adjusting the size of the steam turbines for Ivanpah 2 and 3, the total capacity of the three Ivanpah plants would be reduced, on a nominal basis, to approximately 392 MW. The Mitigated Ivanpah 3 proposal would also somewhat reduce construction efforts, with the result of a slight reduction in workforce and economic benefits. Notwithstanding the adjustment of the capacity of the steam turbines for Ivanpah 2 and 3, the Project's boilers – the sources of air emissions – would not change as a result of the refined configuration. Thus, the potential air quality impacts, other than a reduction in the indirect displacement of emissions from conventional power generation, would be unchanged with the Mitigated Ivanpah 3 configuration.

With this background in mind, the Applicant requests that the Mitigated Ivanpah 3 proposal be included in BLM's NEPA consideration of the proposed project. In regards to other alternatives, the Applicant notes that the CEC proceeding has resulted in a detailed discussion of this issue, and that the CEC's discussion has been made available to the public through the same unitary document as the Draft Environmental Impact Statement, which jointly serves as the CEC's Final Staff Assessment. The resulting record clearly establishes that the proposed location is by far the preferable site for this project. The environmental and renewable energy benefits that would be derived from developing the ISEGS at the proposed location vastly outweigh any adverse environmental impacts, which already have been greatly minimized.

Comment ISEGS-9-3: The one topic in the DEIS pertinent to the preserve that appears to have been addressed adequately is viewsheds. We agree with the conclusions presented in the document that direct impacts to visual resources resulting from the proposed project are significant and immitigable if the solar generating project is constructed in the location {s) and configuration proposed. We would like to explore with BLM as part of the supplemental analysis whether any options exist for re-orienting the project or shifting its site location to reduce the project's intrusion on the park's viewshed.

Comment ISEGS-6-13: We also note that the Project area has increased by about 673 acres from 3,400 to 4,073 acres, comparing the Applicant's initial plans in the Application for Certification (AFC) to the current plan of development The first increase of 300 acres is associated with the increase in spacing between heliostats in order to avoid shading. The second increase in the Project area of 365 acres is a result of the proposed stormwater detention ponds. These have since been eliminated from the Applicant's proposal without any re-adjustment downward in the Project area (at pg. 6.2-8). The SDEIS should apply this acreage to reduce the size of the Project and thus, reduce the environmental impacts on the Project site. For example, there are high densities of rare plants on the project site that should be avoided. In addition, facilities should be located outside of waters. The SDEIS should provide additional details, including acreage or number of species protected, as a result of these reduced size alternatives. This analysis should be incorporated into the conceptual avoidance approach described at page 6.2-41. A voidance of sensitive plant species should be an important consideration in the design and configuration of the heliostat layouts.

Private Land:

Comment ISEGS-6-9b: Similarly, we recommend that the Supplemental DEIS fully evaluate a Private Land Alternative that combines larger private land parcels with previously disturbed public lands.

Comment ISEGS-7-8: BLM dismissed the alternative of locating the project on private land because it would have required the project proponent to complete "option-to-purchase agreements with multiple private owners (FSA/DEIS, page 4-19)." In the case of the Harpers Lake private land option, which "had sufficient land for a 400 MW facility with the configuration of the proposed project," it was rejected by the proponent because "one of the major land owners at the site requested too much money (FSA/DEIS, page 4-20)." This dismissal is unacceptable. The California Energy Commission ("CEC") and BLM should have at least independently analyzed the project proponent's statements concerning cost. Considering the overriding policy impetus toward siting renewable facilities on private degraded land, the agencies have a mandated to fully consider a reasonable range of private land alternatives. The Renewable Energy Transmission Initiative ("RETI") recently issued the following statement:

> RETI stakeholders agree that utilizing disturbed private lands close to existing infrastructure for renewable energy development should be a priority for the state. County governments and state agencies are in the best position to develop mechanisms to consolidate the ownership of extensively-parcelized lands that have excellent renewable resource potential. For this reason, the RETI Phase 2A Final Report includes a formal recommendation that the California Energy Commission, in conjunction with other state and federal agencies, counties and the renewable energy industry, develop and implement a strategy for consolidating ownership of disturbed or degraded private lands for renewable

energy development on an expedited basis (RETI Phase 2A Final Report, page 2-33).

RETI's prioritization of private lands for renewables siting creates a mandate for CEC and BLM to analyze a reasonable number of private lands alternatives. BLM should not preclude 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).

Comment ISEGS-30-1: NPCA understands that the Bureau of Land Management (BLM) and California Energy Commission (CEC) accepted the application for ISEGS in concert with existing land-use designation (Multiple Use Class L), without the guidance of a systemic process to ensure that projects were sited in locations that would minimize environmental loss, or impact to National Park Service units such as Mojave National Preserve. The subsequent development of Solar Energy Study Areas in the California Desert Conservation Area (CDCA) and an eight-state Solar PEIS process demonstrates the Department of the Interior's desire to balance the incentivized boom of renewable energy generation and transmission applications with the persistence of the natural character and retention of resources, wildlife and historic corridors, and unique natural values of the region. The Solar Energy Study Areas provide at least a framework for studying the development of solar energy projects within the California Desert. It should be noted that the private land alternative offered in the DEIS is consistent with the boundaries of the BLM's Pisgah Solar Energy Study Area. The private land alternative in the DEIS is also notable for minimizing environmental impact to pristine land, threatened species, and resource impact to Mojave National Preserve.

Distributed Generation:

Comment ISEGS-22-5: The current proposal is not adequate, a mitigation plan should be stated and have public review before any project is granted the use of 4000 public acres. A better solution for responsible energy policies would be to have localized renewable energy sources such as rooftop solar. I have spent a great deal of time in this area and have found only a handful of private solar applications. I have a Photovoltaic system on my house in Montana, and I know how effective it is. At my northern latitude I produce enough electricity for nine months of the year.

Comment ISEGS-21-4: The FSA did not adequately analyze the private land and distributed generation alternatives to the Ivanpah SEGS. There are large blocks of disturbed, private lands in the Antelope, Imperial, Coachella, and Palo Verde Valleys in California, as well as significant acreage in Arizona. Some of these areas could provide adequate acreage for Bright Source's 400 MW. But as many of the other current solar proposals show, 400 MW of generation capacity is not required to be economically feasible. Less generating capacity is possible. Regarding distributed generation, there is vast potential for renewables, up to 2,000 MW in San Bernardino County alone, according to the FSA. A $2 billion investment (the estimated cost of the Ivanpah SEGS)

in rooftop solar could produce at least 400 MW of generation capacity in the same amount of time or less than it will take to construct the Ivanpah SEGS. Therefore the CEC and BLM should favor the combination of these alternatives, and choose the No Action Alternative for the Ivanpah SEGS.

Comment ISEGS-2-36e: As another example, the discussion of a distributed solar alternative in the DEIS was inadequately explored. Rather than simply setting up a "straw man" alternative to be knocked down, the BLM should have more fully considered this alternative. The Center sponsored testimony from Bill powers on the treatment of the distributed energy alternative in particular which shows that the discussion in the FSA/DEIS of this alternative was inaccurate and inadequate.

Comment ISEGS-1-16a: Although it is not the job of the BLM to list private land alternatives, there is little logic found in the purpose and need for the project as well as the best possible management options for public lands. 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, cultural resources, storm water drainage erosion, endangered species, viewscapes from National Parks and wilderness areas could all be avoided with a distributed generation alternative.

Comment ISEGS-1-16b: The trend in the rest of the world is away from large stand-alone power plants, such as ISEGS, to add ons or augmentation to existing generation. This project is not needed.

Outside Ivanpah Valley:

Comment ISEGS-1-15: We support the No Action Alternative, but we request at least one viable third alternative away from the site and out of Ivanpah Valley be provided in the EIS.

Phased Approval:

Comment ISEGS-2-36d: Other alternatives are clearly available and should have been considered. Although the BLM rejected out of hand many of the alternatives discussed in the FSAIDEIS, it is clear that at least some of those alternatives are both feasible or could be with some additional modifications. At minimum, an alternative site outside of occupied desert tortoise habitat, a phased alternative, and a reduced size alternative, all could have been explored. For example, the FSA/DEIS fails to look at an alternative that would approve the project in phases in order to minimize impacts if unforeseen events occur or if the project fails to perform as hoped at this formerly untested "commercial-scale that is if the first phase demonstrates that this technology for some reason is not technically or economically viable in a commercial-scale project. See FSA/DEIS at 2-5 (Applicant's Objectives).

Wind:

Comment ISEGS-6-11a: EPA supports the development of solar and other forms of renewable energy within Solar Energy Zones (SEZ) and other locations. As a Cooperating Agency for the joint DOE/BLM Solar Programmatic DEIS, and in comments on individual state efforts such California's DRECP, EPA will continue to urge BLM to consider which energy source has the potential, at each specified location, to generate the greatest amount of power with the least environmental impact. For example, if the location of a SEZ overlaps with an optimum location for wind energy development, consider whether the development of solar energy at that location would likely result in greater or lesser adverse environmental impacts than would be expected from the generation of the same or a greater amount of power from
wind energy at that location. We urge BLM and DOE to ensure that the outcome of the Solar Programmatic DEIS does not is courage or preclude the development of other renewable energy sources in locations where such development may be more appropriate, in terms of efficiency and relative environmental impacts, than development of solar energy.

Combination of Natural Gas with Distributed Generation:

Comment ISEGS-1-16c: When clouds obscure the field, the natural gas boilers will have to be used, and this increases carbon emissions with little actual power generation for the amount of land used. But the boilers cannot be stopped and re-started quickly for clouds passing over in a few minutes. The boilers will be used only at partial load, inefficiently. Using the boilers during cloud clover would generate lower pressure steam, thus generating less electricity. Much more benefit could be gained from simply using natural gas at maximum efficiency with fully modern combined cycle natural gas plants and hybrid power plants in load centers, combined with distributed generation.

Previously Disturbed/Developed Sites:

Comment ISEGS-6-11b: Although we support BLM in its efforts to identify the SEZs, we also recognize that there are other alternatives and venues that may be preferable from an ecological perspective. For example, the EPA has worked closely with the DOE's National Renewable Energy laboratory (NREL) to develop maps 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, which was launched by the EPA Office of Solid Waste and Emergency Response (OSWER) in September 2008. Under this initiative, EPA is taking a multipronged approach to encouraging reuse of EPA-tracked lands into clean and renewable energy production facilities. EPA has developed a Renewable Energy Interactive Mapping Tool 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:

- EPA strongly encourages BLM to promote the siting of renewable energy projects on disturbed, degraded, and contaminated sites, before considering large tracts of undisturbed public lands. P. 12

Greenhouse Gas Strategies:

Comment ISEGS-2-33a: Because BLM has failed to accurately and adequately identify the GHG emissions it has also failed to fairly look at alternatives that would avoid such emissions. Indeed, rather than attempt to analyze the impacts, alternatives and mitigation measures as it would with any other impact, BLM simply assumes that because the project is an industrial scale renewable energy project it "would result in a net cumulative reduction of energy and GHG emission from new and existing fossil resources." FSNDEIS at 6.1-59. As a result of this assumption, BLM failed to adequately identify and analyze the GHG emissions flowing from the project approval including failure to even identify or quantify near-term C02 emissions from construction and manufacturing and emissions during the 6-month start-up period, as well as failure to analyze any alternatives to avoid or minimize the long-term emissions from operations that were identified.

Requiring No Plan Amendment:

Comment ISEGS-2-3a: Unfortunately, the DEIS fails to adequately consider the impacts of the proposed project and plan amendment and reasonable alternatives in the context of FLPMA, the CDCA Plan as amended by the NEMO plan amendment. FLPMA requires that in developing and revising land use plans, the BLM consider many factors and "use a systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences . . . consider the relative scarcity of the values involved and the availability of alternative means (including recycling) and sites for realization of those values." 43 U.S.C. 5 1712(c). As stated clearly in the CDCA Plan...CDCA Plan at 5-6. The CDCA Plan also provides several overarching management principles...

CDCA Plan 1980 at 6 (first emphasis in original, second emphasis added).

The CDCA Plan anticipated that there would be multiple plan amendments over the life of the plan and provides specific requirements for analysis of Plan amendments. Those requirements include determining "if alternative locations within the CDCA are available which would meet the applicant's needs without requiring a change in the Plan's classification, or an amendment to any Plan element" and evaluating "the effect of the proposed amendment on BLM management's desert-wide obligation to achieve and

maintain a balance between resource use and resource protection." CDCA Plan at 121. Thus, BLM should have, at minimum, analyzed in the DEIS whether alternative locations were available that would not require a plan amendment, and how the proposed amendment would affect desert-wide resource protection-it failed on both counts.

Sites with no Rare Plants:

Comment ISEGS-8-13: The NEMO Plan set the goal for special status species as "Populations and their habitats are sufficiently distributed to prevent the need for listing" (NEMO Plan at 2-6). For rare plants and special status plant communities the FSA/DEIS provides too little analysis of impacts, inadequate discussion of alternatives that could avoid impacts, and inadequate information about the proposed mitigation strategy and how it will fulfill the objectives laid out in NEMO. The lack of fall surveys likely under-represents the full suite of rare plant taxa occurring on site. The FSA/DEIS concludes that the ISEGS project will result in "impacts to Mojave milkweed and Rusby's desert-mallow" that "would remain significant in a CEQA context even after implementation of the special-status plant impact avoidance and minimization measures described in Energy Commission staff's proposed conditions of certification." (FSA/DEIS p. 1-18) The best way to avoid significant impacts to rare plants occurring at this site is to relocate the project to another, lower resource value site but this was not considered by the BLM in the FSA/DEIS.

Response: *BLM has reviewed and evaluated all public comments received on the DEIS, and also evaluated information received through the CEC hearing process. Based on this information, BLM reviewed the identification, screening, and analysis of alternatives that was presented in the DEIS. As a result of this review, BLM determined that two alternatives which had been screened and eliminated from further evaluation in Section 4 of the DEIS (the I-15 Alternative and the Reduced Acreage Alternative) merited more detailed evaluation. As a result, BLM published the SDEIS on April 16. The SDEIS presented a detailed, resource-by-resource evaluation of a version of the I-15 Alternative (called the Modified I-15 Alternative), and a reduced acreage alternative (called the Mitigated Ivanpah 3 Alternative).*

In addition, BLM evaluated the 21 other alternatives, including several (Private Land, Distributed Generation), that are not within BLM's scope of authority. Following the review of the public comments, BLM reviewed the rationale presented in the DEIS for eliminating the 21 other alternatives from detailed evaluation, including several proposed in the public comments, and concluded that the rationale for their elimination was explicitly provided, and was sound. In some cases, such as Distributed Generation, additional information has been provided.

Finally, BLM noted that the public comments identified two alternatives (Ivanpah Playa and Phased Approval) that were not included in the screening analysis in Section 4 of the DEIS. Because both of these alternatives recommended in the public comments have merit, they have been added to the revised screening analysis in Section 4 of the FEIS.

Conservation:

Comment ISEGS-2-36g: In addition, in order to meet the DOE'S purpose and need to lend funds to projects that "avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases, and employ new or significantly improved technologies as compared to commercial technologies in service in the United States at the time the guarantee is issued" (assuming for the sake of argument alone that this is a proper project objective), the DEIS should have considered alternatives that would provide funding to other types of projects. Such alternatives could include, for example, conservation measures that both avoid and reduce energy use within high-energy use load-centers including the Los Angeles Basin, San Diego, and the Bay Area. Alternative measures could include funding community projects for training and implementation of conservation measures such as increased insulation, sealing and caulking, and new windows for older buildings and new or improved technologies for accomplishing these important goals. Conservation measures are an excellent and quick way of reducing demand in both the short- and long-term and reduce the need for additional power sources. In addition, these measures can provide immediate jobs and training in high population areas with significant unemployment (particularly among low skilled workers and youth).

Response: *DOE's purpose and need for action is to comply with its mandate under the Energy Policy Act of 2005 (EPAct 05) by selecting eligible projects that meet the goals of the Act. DOE's decision in the context of the EPAct 05 is whether to approve or deny a Federal loan guarantee to Bright Source Energy for the Ivanpah Solar Electric Generation Project, and therefore DOE's reasonable alternatives are limited to the loan applicant's proposed project, based on the project attributes described in Bright Source Energy's November 18, 2008 loan guarantee application, and the no-action alternative.*

2.4 Comments on the Alternatives Identification and Screening Process

Comment ISEGS-6-9c: While the DEIS includes a qualitative discussion of the reasons for eliminating alternatives, it does not identify a clear set of quantitative criteria that were used to screen all alternatives in a similar manner, For example, no criteria outlining a cut-off point for competitively priced renewable energy, minimal plant efficiency rates, level of air, water, or habitat impacts were provided. If such criteria were used in the California Energy Commission's Preliminary Staff Assessment, the criteria and resulting quantification of impacts should be incorporated into the SDEIS. Also, it is unclear how unquantified environmental impacts (such as a reduction of air pollutants, reduced water use, reduced impacts to endangered species) may have been considered in the alternatives analysis. Similarly, it is unclear which alternatives may have been eliminated as a result of objective #3 and the lack of sufficient time to conduct adequate environmental evaluations.

Recommendations:

- Provide a clear discussion of the reasons for the elimination of alternatives that are not evaluated in detail and provide a clear set of quantitative criteria to screen all alternatives. The potential environmental impacts of each alternative should be quantified to the greatest extent practicable (e.g., acres of wetlands impacted, tons per year of emissions produced, etc.). For example, the SDEIS should include a matrix that rates each of the alternative on each of the selection criteria and include this information in the Executive Summary. The matrix should also include a description of whether or not an alternative met each of the Project's objectives.
- Clearly identify the economic criteria used for analyzing alternatives. As appropriate, fully consider alternatives rejected in the earlier analysis. The SDEIS should also include a concise summary of the cost-benefit analysis of the Proposed Project and the various alternatives. This information should also be included in the Executive Summary.
- Include analysis to substantiate the claim that Condition of Certification BIO-18 would achieve the same objective as the Reduced Acreage alternative.
- Discuss how unquantified environmental impacts (such as a reduction of air pollutants) have been determined in the environmental analysis.
- Discuss which alternatives were eliminated as a result of project objective #3 and the lack of sufficient time to conduct adequate environmental evaluations.
- Include a full analysis of the Reduced Acreage alterative to provide a comparison of environmental and economic impacts to inform decision making. We also encourage a full analysis of an alternative that combines a Reduced Acreage on-site alternative with renewable energy production off-site on disturbed lands, and that maximizes energy efficiencies while minimizing environmental impacts.

Comment ISEGS-5-4b: Instead, absent any explanation, the DEIS cryptically claimed that some 22 additional alternatives had been considered and rejected. DEIS at 4-1. The BLM was required to explain its reasoning for eliminating alternatives. 40 CFR § 1502.14(a). The whole point of a full alternatives analysis is to foster "informed decision-making and informed public participation." City of Angoon v. Hodel, 803 F.2d 1016, 1020 (9th Cir.1986). Without substantive, comparative environmental impact information regarding other possible courses of action, the ability of an EIS to inform agency deliberation and facilitate public involvement is gone. See Baltimore Gas & Elec. Co., 462 U.S. at 97. NEPA requires the development of "information sufficient to permit a reasoned choice of alternatives as far as environmental aspects are concerned." Colorado Environmental Coalition v. Dombeck, 185 F.3d 1162, 1174 (10th Cir. 1999). It follows that a court will hold an agency's decision as arbitrary and capricious if it unreasonably eliminates alternatives, especially absent any explanation. The BLM violated NEPA by not considering alternatives consistent with the Project's full purpose and need.

Comment ISEGS-31-5: The overall strength, in terms of nature and scope, of the Alternatives analysis in the FSA/DEIR is substantial. The FSA/DEIS's Alternatives

analysis use of the phrase that an alternative was "eliminated from further consideration" is misleading in that regard, as the analyses in the joint document were quite thorough. It would be difficult to conclude that the DEIS's Alternative's analysis is anything other than robust, in light of the facts that:

1. The Siberia alternative analysis is 38 pages long and considers all subjects
2. The Broadwell alternative analysis is 40 pages long and considers all subjects
3. The Private Land alternative analysis is 24 pages long and considers all subjects
4. I-15 alternative analysis is six pages long; it considers only a few subjects but is justified in doing so as there was little detail to show feasibility. This analysis was substantially supplemented through direct and rebuttal testimony in the CEC process
5. Ivanpah Site A alternative analysis is 15 pages long and considers all subjects
6. Ivanpah Site C alternative analysis is 16 pages long and considers all subjects
7. The West of Clark Mountain alternative analysis is an additional 2 pages
8. The Reduced Acreage alternative analysis is 3 pages long, and Applicant is effectively extending and supplementing that analysis with its Mitigated Ivanpah 3 proposal

Comment ISEGS-31-4: Substantial information in regards to alternatives is included in the portions of the record of the CEC proceeding that the Applicant is providing to the Bureau for inclusion in its own administrative record. The Applicant's testimony fully supports the proposed project as the preferred alternative, and the Mitigated Ivanpah 3 proposal has been developed to be consistent with the analyses presented in the CEC testimony and to a large degree of intervenors as well.

In addition, reference should be made to the direct and rebuttal testimony of John Carrier, Steve De Young, Gary Rubenstein, Steve Hill, Tom Priestley, Geoffrey Spaulding, Arne Olson and Roger Gray regarding Alternatives. This testimony clarifies the I-15 alternative considered by the CEC, which would relocate the project closer to the interstate highway just south of the project, would not be preferable to the proposed project location. In the words of the CEC staff, this alternative "would not avoid or lessen project impacts overall." (CEC Staff Exhibit 305, p. 8.) This testimony also demonstrates that rooftop photovoltaic (PV) is not a feasible alternative to the Ivanpah project, but should be thought of as a complement to, and not a substitute for, the project. In particular, the testimony of Arne Olson rebuts the suggestion that central station projects like Ivanpah and distributed PV are interchangeable.

Comment ISEGS-2-36a: If BLM rejects an alternative from consideration, it must explain why a particular option is not feasible and was therefore eliminated from further consideration. 40 C.F.R. 5 1502.14(a). The courts will scrutinize this explanation to ensure that the reasons given are adequately supported by the record. See Muckleshoot Indian Tribe v. U.S. Forest Service, 177 F.3d 800, 813-15 (9th Cir. 1999); Idaho Consew. League, 956 F.2d at 1522 (while agencies can use criteria to determine which options to fully evaluate, those criteria are subject to judicial review); Citizens for a Better Henderson, 768 F.2d at 1057.

Comment ISEGS-30-16: A more comprehensive study of alternatives is required. Alternatives should incorporate more up-to-date information about Solar Energy Study Areas, private land alternatives, and sites that offer less impact to imperiled species and degradation to the resources of Mojave National Preserve. Any preferred action alternative should discuss how ISEGS in its current location is a superior alternative to alternate locations. The No Action alternative must include comprehensive information about proposed projects that provide similar benefits to ISEGS at reduced environmental cost. The alternatives should list statewide proposed projects, locations, and generation capacity. This allows the public to understand where we stand relating to the need to meet RPS goals, and thus the need to develop ISEGS.

Comment ISEGS-6-11c: The SDEIS should discuss any tools BLM is using to prepare the alternatives analysis for this Project, including the use of the Renewable Energy Interactive Mapping Tool.

- SDEIS should include information regarding all criteria used to evaluate the ISEGS site and alternatives.

Comment ISEGS-33-4: The FSA must include economic analyses of the proposed project and alternatives. Economic considerations are mentioned in numerous places in the documentation. This is understandable, since the project probably would not exist without economic justification, and a cost-to-benefit analysis. An economic analysis is necessary to evaluate the project, and to compare it with alternatives. We are forced into the terms 'cost more', or 'cost less', with no quantification, without economic analysis. Intelligent opinions and decisions cannot be made based on such nonspecific terms.

- The discussion of the CDCA plan amendment on page 2-12 specifically includes as one of the required determinations that the DEIS do economic evaluation:...
- The Alternatives section, on page 4-1, recognizes the validity of economic analysis:...
- The Project Objectives section on page 4-4 includes economics in construction, operation and competitive pricing:...
- Page 4-11, in the Site Selection Criteria discussion in the Alternatives section recognizes economic viability as one of the criteria:...
- NEPA requires that alternatives be practical and feasible from the technical and economic standpoint (emphasis added) .. As referenced on page 4-1 of the FSA, NEPA guidance is:...
- The bottom of page 4-79, in the Alternatives section, requires an economic analysis to support the conclusion. By stating only that lower PV costs are needed, the reader must accept without analysis that this is true, is not told of the magnitude of the cost difference, and is not told of the expected future PV costs. Note that the popular press commonly talks of rapidly decreasing PV panel costs, and increasing efficiency...

- Page 4-65 discusses the reasons for elimination of rooftop solar as an alternative. One reason given is the uncertainty of subsidies for rooftop solar. With no economic analysis it is impossible to compare the subsidy status of rooftop solar with the subsidy status for the proposed CSP technology.

It is tempting to say that the project is necessary, no matter the cost, for the public good of reducing global warming, currently accepted as a necessary goal. But it is still a matter of degree. If the project provided only enough power to keep a 100 watt bulb lit, the balance would not justify the environmental cost. Or if it provided enough energy for all of California for the next 50 years, the balance would easily justify the environmental cost.

Additionally, since the project is subsidized with public money and will use public land, transparency demands that the economics of the project be revealed to the public.

An economic analysis should include comprehensive details, including:

- Cost of construction.
- Cost of financing the construction.
- Cost of land usage - purchase or lease.
- Operation costs when the facility is up and running.
- Insurance costs.
- Revenues from electricity sales.
- Taxes
- Government subsidies
- Other costs and revenues.

Comment ISEGS-6-10: The DEIS indicates the "ISEGS project would have major impacts to the biological resources of the Ivanpah Valley, substantially affecting many sensitive plant and wildlife species and eliminating a broad expanse of relatively undisturbed Mojave Desert habitat" (at pg. 6.2-1). As additional alternatives are considered for evaluation in the SDEIS, as well for future projects, EPA continues to recommend the identification of locations that have been previously disturbed or contaminated. The SDEIS should discuss the criteria BLM used to identify the ISEGS site as a suitable location for renewable energy. Specifically, the SDEIS should include the full array of criteria that BLM uses to compare sites, such as previous disturbance, protected species, habitat values, proximity to infrastructure, energy potential, etc. The SDEIS should discuss any methods or tools BLM has used to identify and compare locations for siting renewable energy facilities.

Comment ISEGS-2-11a: Although there is much discussion of the high "solarity" of the area, nowhere in the DEIS does the BLM disclose that the area is subject to summer rain and has far more cloud cover than many other areas of the California desert due to its proximity to the Colorado river. Indeed, the project applicant was unaware of the extent of clouds at the site which they now estimate to be up to 700 hours per year, approximately 10% of the operating time, and estimate to impact energy production by

approximately 5%. Similarly, the DEIS fails to reveal that the site is shadowed by the Clark Mountains and the mountains in the Stateline Wilderness which cut off sunlight late in the day in both summer and winter. As a result, any comparison of alternatives sites based on solarity was incomplete and flawed. See FSA/DEIS at 4-10 (discussing need for alternative sites to have "appropriate solarity"). It is impossible to tell how many potentially viable alternative sites were rejected based on having lower "solarity" than the Ivanpah site but it is certain that such analysis was fatally flawed.

Response: *The comments on the alternatives screening process raise two primary issues: 1) that BLM has not explained the rationale for rejection of the alternatives; and 2) that the presentation and evaluation of alternatives in Section 4 of the DEIS should include a quantitative comparison, including comparison of life-cycle costs, energy output, greenhouse gas emissions, environmental impacts (such as tons of emissions or acres of wetlands impacted), and other criteria.*

CEQ regulations at Section 1502.14(a) acknowledge that the alternatives analysis needs to be a multi-step process, with some alternatives being eliminated from further consideration without the need for detailed study. The regulation requires that these alternatives be identified and evaluated, and that the rationale for their elimination be provided – however, it does not require detailed evaluation of alternatives that have not been identified as reasonable alternatives. The identification and preliminary screening evaluation of alternatives in Section 4 of the DEIS is consistent with this requirement. The text on Pages 4-9 through 4-11 generally describes some of the technological and jurisdictional rationale for why some classes of alternatives were determined to not be reasonable or feasible alternatives to meet the purpose and need for the proposed project. Then, instead of simply dismissing these alternatives, the DEIS goes on to describe and present a resource-by-resource summary of the associated impacts of many of these alternatives, and ends each subsection with a paragraph titled "Rationale for Elimination". Although these alternatives were not carried into the resource sections for detailed analysis, Section 4 does provide enough information, even on those alternatives determined not to be reasonable, to explain why the alternative was not carried forward for more detailed evaluation, and to allow a comparison of impacts between the alternative and the proposed project.

With respect to the second item – BLM agrees that quantitative comparison of alternatives is a critical part of a detailed evaluation among feasible alternatives. However, quantitative comparison is not appropriate for all levels of an alternatives analysis. As discussed above, CEQ's NEPA regulations acknowledge that alternatives analysis is a multi-step process in which each step becomes more and more detailed. The identification and evaluation of impacts associated with alternatives in Section 4 of the DEIS was intended to be a preliminary screening evaluation to identify those alternatives which could reasonably meet the purpose and need for the proposed project. The rationale for the elimination of alternatives was provided, and clearly marked as such. In all cases, the rationale for elimination was based on qualitative factors, and detailed quantitative and economic comparison would not provide any information that would further inform the decision regarding which alternatives to carry through for more detailed analysis. In the SDEIS, BLM made the decision to perform

the more detailed analysis on two additional alternatives – the Mitigated Ivanpah 3 Alternative, and the Modified I-15 Alternative. In both cases, the more detailed evaluation in the resource discussions included quantitative comparison of impacts, where possible. This included estimates of disturbed acreage, water usage, acres of Waters of the State, numbers of tortoises potentially impacted, air emission concentrations, and distances from potential receptors.

Comment ISEGS-7-9: Many of the potential alternative locations were eliminated from consideration due to other applicants, or in some cases, the same applicant having filed an application with BLM to develop the property. While BLM has yet to review or act on these applications, BLM has inexplicably determined that such applications confer a property right in federal lands, stating that "existing applications for renewable projects give applicants prior rights to BLM-administered lands (FSA/DEIS, page 4-11)." This also appears to be without any regard to the ultimate viability of any such projects. Beyond the panoply of legal issues that this raises, the policy it promotes – encouraging a race to file applications in an effort to claim territory is antithetical to efforts to responsibly develop solar energy projects while minimizing impacts to wildlife and other resources.

Comment ISEGS-7-10: Even more inexplicable is BLM's elimination of the Siberia East Alternative site based on the existence of two prior applications having been filed – both by Brightsource – the same applicant as for this ISEGS project. BLM's stated reason for eliminating that alternative from analysis was that "Brightsource maintains active applications with BLM and desires to develop both sites. As such, it has been eliminated from potential selection (FSA/DEIS, page 4-13)." This reasoning by BLM fails to meet basic standards of logic, let alone the detailed requirements of NEPA. See Simmons v. United States Army Corps of Eng'rs, 120 F.3d 664, 666-7 (7th Cir. 1997) ("One obvious way for an agency to slip past the strictures of [NEPA] is to contrive a purpose so slender as to define competing 'reasonable alternatives' out of consideration (and even out of existence). The Federal Courts cannot condone an agency's frustration of Congressional will. If the agency constricts the definition of the project's purpose and thereby excludes what truly are reasonable alternatives, the *environmental impact statement+ cannot fulfill its role.").

Response: *Based on a review of the comment and the associated text, BLM has deleted the statements that an existing application conferred a property right, and that this was a valid reason to not perform a detailed evaluation of the alternative. The rationale provided in the DEIS for the elimination of the Siberia East site, that it did not provide any substantial environmental advantages over the proposed site, remains as the rationale for elimination in the text of the FEIS.*

2.5 Specific Technical Comments Made on the DEIS Text

Comment ISEGS-33-10a: Site Selection Criteria, page 4-10 The applicant's AFC restricts alternatives to areas with high solarity. I appreciate that the DEIS considers other areas and non-solar technologies, as required by NEPA.

Comment ISEGS-33-10b: Siberia East Alternative, page 4-12 This looks like it is in Senator Feinstein's California Desert Protection Act of2010, introduced in late December, 2009. The bill precludes solar installations. The site should not be considered until the bill is resolved, and because it may not be available if the provision in the bill as introduced becomes law. Broadwell Lake Alternative, page 4-12 As with Siberia East, this looks like it is in Senator Feinstein's California Desert Protection Act of 2010, and should not be considered until the bill is resolved.

Comment ISEGS-33-10c: Private Land Alternative, Daggett Area Something seems amiss here.

- 1-15, south side adjacent: Figures 5A and 5B show the site, adjacent to 1-15, on the south side.
- 1-40 north side adjacent: Text on p. 4-20 identifies the site as the location of the 'first two power tower facilities', presumed to be SEGS I and SEGS II, and says the site is too close to the BarstowDaggett airport. But SEGS I and SEGS-II are adjacent to 1-40, on the north side. As stated on page 4-20. SEGS I and II are indeed close to the airport. What, then, are the sites shown in figures 5A and 5B? Which is the evaluated alternative. The confusion makes evaluation and comment of the alternative difficult. It's possible that proximity to the airport is not a consideration.

Comment ISEGS-33-10d: Parabolic Trough Technology, p 4-55
Disturbed area seems inconsistent: Approximately 2000 to 3200 acres would be required ... permanent loss of desert habitat Next paragraph: ... somewhat greater acreage may be required ... Greater than the proposed ISEGS, or greater than the 2000-3200 acres?

Comment ISEGS-33-10e: Linear Fresnel Technology
The technology is eliminated because it is proprietary to Ausra. The statement on p 4-60: This technology ... it is not available to the ISEGS applicant is not supported by evidence or a statement that Ausra has refused to supply Ivanpah. It seems reasonable that Ausra would be willing to expand their business by supplying technology. Please provide evidence that BrightSource has made good effort to use Ausra as a supplier, has been refused, and why Ausra would be unwilling. The enticing advantage is the substantial reduction (approx Y2) in disturbed land described in the Linear Fresnel discussion. This advantage warrants a more intensive investigation and analysis.

Comment ISEGS-33-10f: Solar Photovoltaic Solar voltaic appears to be eliminated for insufficient reason. Instead, the explanatory text makes it sound like photo voltaic could be a better alternative. Page 4-62 states solar photovoltaic was eliminated from consideration because it would not reduce major impacts to several characteristics of the alternative. These reasons are stated with no analysis and are not supported by the descriptive text preceding the elimination opinion. Reasons given for elimination of photo voltaic (pA-62, Rationale for Elimination):

1. Visual prominence. The reasoning is invalid. The proposed technology has vastly greater visual prominence: It has light collector towers, each 450 feet high - as tall as a 45 story building - and each bright as the sun. It has several thousand acres of bright heliostat mirrors. The photovoltaic field visual prominence would be insignificant by comparison. "Glare would not be created (p. 4-65, 6th para)", and the tallest component mentioned is the transmission line interconnection. Although not stated in this solar voltaic section, the distributed solar section confirms that PV glare has less visual impact. Page 4-64: Because most PV panels are black to absorb sun, rather than mirrored to reflect it, glare would not create visual impacts as with the power tower, Fresnel, and trough technologies. To eliminate this alternative based on visual prominence is wrong.

2. Extent of land and roads required. No analysis is given for this opinion. Instead, the explanatory text indicates more land might not be required. Page 4-60, next to last paragraph: Because PV technologies vary, the acreage required per MW of electricity produced from a large solar PV power plant is wide ranging and likely to change as technology continues to develop. The land requirement varies from approximately 3 acres per MW of capacity for crystalline silicon to more than 10 acres per MW produced for thinfilm and tracking technologies (NRDC 2008). Therefore, a nominal 400-MW solar PV power plant would require between 1,600 and 4,000 acres.

    - This indicates photo voltaic area requirement could be as low as 1600 acres, 40% of the proposed power tower. This is very significant, and ignored in the elimination conclusion.
    - Technology is changing. The promise is not analyzed. New technology would most likely result in lower land area needed.

3. More extensive grading. Page 4-61, last paragraph: "Because solar PV facilities require land with only 3 percent slope and the solar panels are grouped more densely together, it is likely that more grading would be required for a solar PV facility than for a solar power tower facility to establish manmade stormwater conveyance channels."

    - No explanation is given as to why the different drainage grading applies to the proposed and photo voltaics.
    - No analysis is given to determine the amount of 'more grading'.
    - The 3% slope requirement used as the basis for more grading is invalid since the slope of the proposed site is approximately 1.5% (as scaled from the USGS Mesquite Lake 1: 100,000 map).

4. More extensive storm water management Again, no explanation or analysis is given. Distributed Solar Technology -- Rooftop Solar Page 4-62: Something is wrong. In order to be a viable alternative to this project, there would have to be a sufficient number of panels to provide 400 MW of capacity. California currently

has 441 MW of distributed solar PV systems which cover over 40 million square feet (CPUC 2008b). The proposed 400 MW project covers 174 million square feet (4000 acres). California gets a few more MW from 23% of the area -- 441 MW from 40 million sq ft. Maybe the 441 MW is the actual power output - average over a year - not the maximum instantaneous output, the rating method for the proposed CSP. The 23% is in the range of capacity factors for CSP solar installations. Distributed Solar Thermal Systems The proposed CSP technology uses 4000 acres to generate 400MW - 10 Ac/MW. The three alternatives discussed use less:

4 Ac/MW	eSolar 5MW	20 ac/ 5 MW
3.5 Ac/MW	eSolar 46MW	160 ac/46MW
2.5 AC/MW	Andasol 1	127 ac/50MW
Compare With		
10 AC/MW	Ivanpah proposed	4000ac/ 400MW

Although not mentioned in the FSA, I suspect the two eSolar and the Andasol facilities use wet cooling, which reduces efficiency and increases the Ac/MW figure. But, it's a big jump from 2.5 - 4 Ac/MW to 10 Ac/MW. This potential efficiency level should not be discarded lightly. eSolar is characterized as a distributed technology, probably because of the relatively small 20 ac size of their demonstration facility. But eSolar facilities are modular, as explained by the company. The single, small facility is one configuration. Multiple modules at the same site can achieve characteristics of larger installations, since the modules can share the same infrastructure. eSolar appears to be a viable alternative and should be not be restrained to consideration as distributed only.

Response: *Each of the specific comments regarding the alternatives discussions in Section 4 of the DEIS were reviewed by BLM. In each case, the existing text was reviewed, and if necessary, text changes were made in the FEIS to address the comment.*

Comment ISEGS-33-10g: Rationale for Elimination (starting page 4-64) The reasons for elimination appear invalid.

- ... require even more aggressive deployment of PV...This is not a reason to eliminate. Aggressive deployment is not to be feared. The current CSP proposal is aggressive, but is not eliminated for that reason.
- Additional legislation ... may be required. With no further explanation, the 'may be' has no meaning. The implication is that requiring new legislation is enough to eliminate the alternative. I have a more optimistic view, that if new legislation is warranted, it will happen. The California legislature has shown deep interest in energy. If a new idea is warranted, they would not shy away because new legislation would be required.
- Subsidies The discussion reviews subsidies and their positive effects on the technology. The last sentence talks of the uncertainty of continued subsidies.

Since this discussion is in the Rationale for Elimination section, I presume the opinion is that the uncertainty outweighs the positive effects sufficiently to discard the alternative. I disagree with this basically negative opinion. Also, since the FSA presents no economic analysis of the proposed project, it is impossible to evaluate the extent and uncertainty of subsidies for the proposed project.

- Feed-in Tariffs The discussion describes feed-in tariffs. It does not state, or imply, how FITs are cause for elimination of the technology. There does not appear to be a reason to put this discussion in the Rationale for Elimination section.
- Manufacturing and Installation Costs As with FITs~ there is a short, general discussion. It then concludes" ... would require a large number of retrofit installations." (Page 4-65, bottom), without explaining the conclusion, or why the conclusion is cause for elimination of the technology. The next sentence: No matter how it is installed, relying heavily on PV greatly increases the total cost a/meeting state renewable energy and GHG targets. Again, there is no explanation of the' greatly increased cost'. There is no way to evaluate the validity of the conclusion. And with no economic analysis of either technology, there is no way to compare.
- Manufacturing Scaleup, and the final paragraph in the Rationale for Elimination section The discussion says the technology is increasing rapidly, and that PV manufacturing is ramping up fast. There must be something good going on here. The FSA makes no attempt to discover, or participate. Money and materials has to grow fast. Page 4-66: the availability of financing and raw material supply would need to increase proportionally to match an increased demand. This is far from an insoluble problem. New, viable technologies very often ramp up fast to satisfy demand. Often the result lowers manufacturing costs and expands supply to meet more than demand, further lowering costs. We should not ignore such efficiencies.

Response: *The following summary of information regarding the potential for distributed solar to be a viable alternative to the proposed ISEGS project was provided by the Energy Commission, from the Opening Brief on April 1, 2010.*

The Center for Biodiversity (CBD) provided testimony that the FSA had incorrectly dismissed distributed solar photovoltaic (DPV) generation as a feasible alternative. (Exh. 939 [Testimony of Bill Powers, P.E.].) This testimony contends that there is the feasible potential to site 400 MW of DPV in California at a cost that is lower than ISEGS, that Staff used obsolete numbers overstating the cost of DPV, and that the entire renewable "gap" for meeting a 33 percent Renewable Portfolio Standard (RPS) requirement by 2020 might feasibly and economically be met with DPV. (Ibid.) By implication, the testimony appears to contend that no additional central station power is required in California, and that DPV should be sufficient for all future electric generation needs.

The CBD testimony is serious and well-informed, but decidedly optimistic. The RPS requirement is a very aggressive one: that the state's utilities provide 33 percent of all

electric energy generation from renewable sources such as solar, wind, and geothermal by 2020. California is currently far from achieving that goal; the renewable "net short" for meeting the RPS requirement is estimated to be between 45,000 and 75,000 gigawatt hours (GWh), depending on assumptions made for electricity demand as well as energy efficiency, rooftop solar, and various other assumptions. (2009 Integrated 24 Energy Policy Report (IEPR), p. 187.) RPS is based on a utility's retail sales, so "behind the meter" renewables such as roof top solar are not counted in the 33 percent requirement (although its contribution does reduce the overall requirement by reducing retail sales). (2008 Integrated Energy Policy Report Update, p. 18.)

The contribution from DPV, however defined, shows great future potential, but fairly paltry concrete contributions thus far. The IEPR cites the same enormous DPV potential that CBD cites, but notes that this potential has been "largely untapped." (2009 IEPR, pp.198-199.) The IEPR reports a total of 560 MW of installed DPV, much of it not eligible for RPS, and reports that the IOUs have "over 180 MW of projects 20 MW or smaller . . . [which is] less than two percent of IOU RPS contracts." (Ibid.) CBD's witness agreed that the current total contribution of DPV is roughly 500 MW. (01/12/10 Tr., p. 285.)

Applicant provided rebuttal testimony raising additional problems with CBD's DPV alternative testimony. Applicant's testimony was provide by Arne Olson, who is currently advising the California Public Utilities Commission on its Long Term Procurement Planning Process and particularly on integrating DPV generation to meet RPS needs. (Exh. 85, p. A-7.) That testimony pointed to the logical fallacy of arguing that any 400 MW of DPV was an alternative to ISEGS, as the purpose of ISEGS is to satisfy an RPS goal that requires more than an order of magnitude more generation than ISEGS (or a 400 MW alternative) would provide. (Exh. 85, pp. A-9, 10.) It makes no sense to reject all solar thermal facilities (or in fact, all wind or natural gas facilities) merely on the supposition that someone could provide 400 MW of DPV somewhere else.

To meet its RPS goals, California will need renewable generation from a variety of sources, for thousands of MWs. DPV will not likely be sufficient to fill the entire "net short" for RPS. (Ibid.) Staff's cost estimates for DPV were reasonable. (Id., at pp. 16-19.) Feasibility issues arise for interconnecting larger and larger amounts of DPV. (Id., at pp. 14-16.) Moreover, from the system operator's perspective, DPV "masks" electricity demand and requires ready dispatchable backup because of its intermittency. (Id.,at p. 22.)

Recommendations for Alternative to be Selected

Comment ISEGS-1-1: Therefore we recommend the No Action alternative to avoid these impacts.

Comment ISEGS-1-31: Because of these significant cumulative impacts to the visual quality of the popular California Desert recreation area, the No Action alternative should be considered.

Comment ISEGS-1-51: While the use of solar energy can be a clean technology, it is not environmentally responsible unless it is sited properly. Because solar energy requires so much space to produce the desired amount of energy from any given project, it will have a massive footprint if it is placed on relatively undisturbed land. The BLM lands in the area of the project site are preserved for multiple use activities, but giving away so much land for energy development only conforms to one user group, energy developers. There are alternatives to this kind of "energy sprawl".

This project will not mitigate any climate change impacts to the species present in Ivanpah Valley. No desert species of plant or animal would be helped by building this project, as large intact habitats are needed for species movement, gene flow, and adaptation during any climate change occurrences. Maintaining large desert ecosystems as they are under protective management will be a much better alternative to reducing the local and global impacts of climate change.

Human management intervention to help tortoises should not be in the form of building large development projects on habitat, such as the ISEGS project, which have doubtful climatic benefits, but rather conservation biology would recommend removing disturbances from the desert ecosystem, managing for maximum genetic connectivity, and increasing carrying capacity by preserving large, contiguous, intact natural landscapes.

Even if the project could reduce the amount of climate change by a small amount, it would be very difficult to counter the loss of large blocks of healthy mature ecosystems and desert tortoise habitat. Loss of habitat is a crucial factor in elevating the level of protection given to a species. Preserving intact ecosystems is the best way to conserve listed species, rare plants, ecological interactions such as plants and their pollinators, and migration corridors. For many reasons, we support the No Action Alternative.

Comment ISEGS-1-50: In addition to the Ivanpah Valley proposed developments, including solar, wind, train, and other projects, more renewable projects are proposed for the California Desert. In a recent phone conversation with CEC, we were told that ISEGS is "the tip of the iceberg." In the California Deserts the current dozen or so solar thermal projects with applications in represents a mere 4% of the coming applications. That would mean more than 200 industrial-scale solar thermal projects are looking to built on the Mojave and Colorado Deserts in the state. And that does not include large photovoltaic projects on valley floors and utility-scale wind projects on hills and ridges.

We request that BLM carefully consider the cumulative impacts on desert tortoise, bighorn sheep, other wildlife, rare plants and plant communities, water and soil resources, visual resources, and recreational multiple use of both Ivanpah Valley (including Nevada), and the California Desert Conservation Area. Very significant industrialization of scenery, habitat degradation and fragmentation, reduction of soil and vegetation carbon sequestration, water use, loss of tourism dollars, and loss of multiple use on lands outweighs any small benefits of adding a few renewable energy jobs and

reducing carbon emissions by a small amount. The large footprint on multiple use land and very small amount of electricity actually generated leads us to request the No Action alternative, giving stakeholders more time to discuss better siting of these power plants.

Comment ISEGS-8-19: In summary, the direct, indirect and cumulative impacts of this project on desert tortoise, rare plants, and visual resources are so great that adequate mitigation will be impossible to achieve unless the BLM considers making major changes to its management of the North Ivanpah Valley. If the BLM is not prepared to do so it must deny the right-of-way application.

Comment ISEGS-2-46: Thank you for your consideration of these comments. In light of the inadequacy of the environmental review to date, we urge the BLM to revise and re-circulate the DEIS before making any decision regarding the proposed plan amendment and right-of-way application. In the event BLM chooses not to revise the DEIS and provide adequate analysis, the BLM should reject the right-of-way application and the plan amendment. Please feel free to contact us if you have any questions about these comments or the documents provided.

Comment ISEGS-2-1a: Nonetheless, even the inadequate information provided in the DEIS shows that the proposed plan amendment and right-of-way application should be denied because the proposed project will result in significant impacts to a healthy breeding population of desert tortoise in an area essential to the recovery of the species. Alternative siting, which the BLM failed to adequately address in the DEIS, would significantly reduce the impacts to this listed and still declining species, its occupied habitat, and other special status species including rare plants and desert bighorn sheep. The Center urges the BLM to revise the DEIS to adequately address these and other issues detailed below and re-circulate the DEIS for public comment.

Comment ISEGS-12-1: It is our considered recommendation that the Bureau of Land Management (BLM) should reject BrightSource Energy's applications for four ROW grants to construct its Solar Electric Generating System (ISEGS) on 4,073 acres of public land in the Ivanpah Valley. While we recognize that solar power facilities are an allowable use of Multiple Use-Class L lands as classified in the California Desert Conservation Area (CDCA) Plan of 1980, as amended, the BLM should select the "No Project/No Action Alternative" ... for the sufficient reason that the ROW applications fail to satisfy the fourth Decision Criterion in the Energy Production and Utility Corridors Element in Chapter 3 of the CDCA Plan to "avoid sensitive resources wherever possible" (1999, 93). Specifically, the Proposed Action Alternative fails to avoid significant and adverse impacts to the Northeastern Mojave Desert Tortoise Recovery Unit of the Federally listed Mojave desert tortoise.... Whether ISEGS jeopardizes the survival of the Mojave desert tortoise or one of its distinct population segments must, therefore, be an primary consideration of the BLM's in its decision on the BrightSource Energy ROW applications.... The Biological Assessment emphasizes that the proposed site is located within the southeastern portion of the planning area boundary of the Northern and Eastern Mojave Desert Management Plan (Biological Assessment 2009,

p. 3-1). While an accurate statement geographically, the key consideration for the BLM must be that the construction of ISEGS will directly, indirectly and cumulatively impact the Northeastern Mojave Desert Tortoise Recovery Unit.

Comment ISEGS-12-4a: The No Project/No Action Alternative should be selected because the Applicant's proposed relocation/translocation plan, if implemented as specified in Attachment D of the Biological Assessment (2009), will jeopardize both the relocated/translocated and the host populations of desert tortoise.

Comment ISEGS-4-11: The Project would result in numerous direct and indirect impacts on the desert tortoise population. It is my professional opinion that there has not been adequate mitigation to reduce these impacts to a level considered less-than-significant. As a result, the BLM must reject BrightSources's ROW application.

Comment ISEGS-39-1: The Council, based in its review of the Final Staff Assessment/ Draft Environmental Impact Statement (FSA/DEIS), believes that the construction of the proposed Ivanpah Solar Electric Generating System (ISEGS) would conflict with the goals of the *Desert Tortoise Recovery Plan* (1994) to conserve and recover the Mojave Desert Tortoise and would contribute to the likely extirpation of the Northeastern Mojave (NEMO) Desert Tortoise Recovery Unit in the Ivanpah Valley. The Desert Tortoise Council recommends, therefore, that the California Energy Commission select the "No Project/No Action alternative" with respect to the Application for Certification from BrightSource Energy.

Comment ISEGS-39-7: Simply stated, the future of the Ivanpah Valley desert tortoise population is at risk. The Desert Tortoise Council, therefore, recommends that the California Energy Commission select the "No Project/No Action alternative" with respect to the BrightSource Energy Application for Certification.

Response: *BLM appreciates the recommendations in support of selecting the No Action Alternative as the Preferred Alternative. Although it was not chosen as the Preferred Alternative in the FEIS, comments in support of the No Action Alternative were considered, and will be further considered in the ROW grant decision in the Record of Decision.*

3.0 PURPOSE AND NEED

3.1 Scope of Purpose and Need

Comment ISEGS-6-8b: For NEPA purposes, the ISEGS DEIS indicates "alternatives identified must be consistent with BLM' s purpose and need for the action under consideration, which include consideration of the applicant's objectives" (at p. 4-4). For reasons stated earlier, EPA believes BLM's current Purpose and Need statement is too narrow. Further, the Applicant's objectives were ultimately synthesized into the three previously mentioned objectives, which EPA believes unduly constrain the viability of alternatives.

Comment ISEGS-10-1: Consideration of alternatives is crucial to ensuring that any renewable projects permitted by the BLM on public lands are not only on appropriate sites, but also that they are configured in appropriate ways. NEPA's alternatives analysis is "the heart of the environmental impact statement." 40 CFR § 1502.14. Under NEPA, BLM is required to "rigorously explore and objectively evaluate" a range of alternatives to proposed federal actions. See id. §§ 1502.14(a) and 1508.25(c).

It is well-established that an agency must look at all reasonable alternatives to the proposed action, Northwest Envtl Defense Center v. Bonneville Power Admin., 117 F.3d 1520, 1538 (9th Cir. 1997), including more environmentally protective ones, as well as that an actual range of options must be considered, see e.g., City of Tenakee Springs v. Clough, 915 F.2d 1308, 1310 (9th Cir. 1990). While this range is dictated by the nature and scope of the proposed action, NEPA precludes an agency from "defin[ing] the objectives of its action in terms so unreasonably narrow that only one alternative ... would accomplish the goals of the agency's action," rendering the EIS "a foreordained formality." Friends of Southeast's Future v. Morrison, 153 F.3d 1059, 1066 (9th Cir. 1998). Regrettably, that is exactly what the BLM has done here.

Comment ISEGS-10-2: TWS and NRDC urged careful consideration of alternative configurations of the proposed projects in addition to alternative sites in our comments on the Preliminary Staff Assessment prepared by California Energy Commission (CEC) staff as did others. See, e.g., DEIS at 4-53. The Sierra Club submitted its own alternative, the "'1-15 Alternative" that was rejected, in an effort to avoid some of the projects worst impacts. See, e.g., id. at 4-49. But, rather than analyzing a range of reasonable alternatives, the BLM considered none: not a smaller project, not a phased project, not a project at a different site or different area of the ROW application.

The BLM considered only the "no action alternative" and approval of the project as proposed by the proponent. See, e. g., at 4-1 ("the only alternatives that are within the agency's [BLM's jurisdiction, and that meet the purpose and need for the proposed project, are approval of the right of way ... and denial of the right of way .... "). The proffered rationale for this patent disregard for NEPA's most important mandate is, as indicated, the unreasonably narrow purpose that the BLM has adopted - i.e., "to approve, approve with modifications, or disapprove ROW applications filed by" Ivanpah's proponents. Id. at 2-7. Numerous alternatives that were "potentially feasible technically and economically," were developed, id. at 4-1, and are described in the DEIS, but they were all "eliminated from further consideration by BLM" because none "would meet the purpose and need for the proposed action, id. at 4-3. This purpose and need is focused almost entirely on the proponent's purpose without consideration of "the BLM's purpose and need" - even though such consideration is required by the BLM's own NEP A Handbook. Department of the Interior, Bureau of Land Management, National Environmental Policy Act Handbook at 35.

Comment ISEGS-5-4a: According to the DEIS' stated purpose, the BLM was required to determine "whether granting the requested ROW is in the public interest." DEIS at 2-

7. As for the Project's need, the DEIS cited several federal orders and laws covering renewable energy development. DEIS at 2-7, 2-8. The three cited authorities promote approval of renewable projects on federal land. For example, the DEIS cited state and federal goals to produce 10% of the nation's electricity from renewable sources by 2012 and 25% by 2025; and approving 10,000 MW of non-hydropower renewable energy projects on public lands by 2015. Id. Importantly, the cited authorities did not waive environmental protection in order to meet renewable energy goals. On the contrary, Executive Order 13212 requires development of renewable energy in an expeditious, safe and environmentally sound manner. Similarly, Secretarial Order 3285 mandates development of renewable energy in an "environmentally responsible" way, and there is nothing in the 2005 Energy Policy Act that preempted federal environmental laws. Environmental protection is express in any BLM public interest determination, and implicit in the cited authorities. Therefore, protection of natural desert resources is part of the Project's stated purpose and need.

By simply including a Project and No Project option, it appears the BLM failed to fully consider the environment in its environmental impact statement. Worse, the BLM completely discounted any possibility of allowing renewable generation to go forward at the site in a less environmentally damaging way. Because protection of biological resources and promotion of new renewable generation are both by definition project objectives, a full range of Project alternatives that avoided or reduced impacts on the environment and allowed some measure of generation was required. City of Carmel-by-the-Sea v. U.S. Dep't of Transportation, 123 F.3d 1142, 1155 (9th Cir. 1997) (stated project goal necessarily dictated the reasonable range of alternatives, thus agency cannot define its objectives in unreasonably narrow terms).

Comment ISEGS-7-3: Additionally, the FSA/DEIS fails to analyze a reasonable range of alternatives, narrowly defining the project's objectives in such a way as to preclude assessment of many viable alternatives on private and degraded land. Defenders would ultimately like to see this project's impacts avoided if possible or mitigated to the greatest extent practicable. To that end, we offer the following comments.

Comment ISEGS-7-6: 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. Agencies must "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." 42 U.S.C. § 4332(2)(E). NEPA requires that an EIS must discuss alternatives to the proposed action, "to provide a clear basis for choice among options by the decision-maker and the public." 40 C.F.R. § 1502.14; see also 42 U.S.C. § 4332(E); C.F.R. §§ 1507.2(d), 1508.9(b). 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). NEPA documents considering a no-action alternative along with "two virtually identical alternatives," have been faulted for "fail[ing] to consider an adequate range of alternatives." Muckleshoot Indian Tribe v. U.S. Forest Service, 177 F.3d 800, 813 (9th Cir. 1999).

As a result of arbitrarily limiting the purpose and need, the BLM only analyzed two alternatives: the proposed action and the no action alternative. 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) project modification; (2) private land development on disturbed lands; and (3) alternatives outside the jurisdiction of the BLM.

Comment ISEGS-2-36b: Here, BLM so narrowly construed the project purpose and need (and ignored the requirements for NEPA analysis of a plan amendment) that the DEIS did not actually "consider" any alternatives to the proposed project. After summarily rejecting 23 alternatives many of which would have avoided significant impacts to the environment, the BLM stated...

FSA/DEIS at 4-1. However, BLM's "jurisdiction" is not so narrow; BLM can, and indeed must, undertake full consideration of alternatives under NEPA when reviewing a plan amendment and proposed project and (as discussed above regarding the plan amendment and below), there are several potential alternatives that would have fallen well within BLM's jurisdiction including a plan amendment to promote conservation of the desert tortoise and protect the high-quality tortoise habitat in the Northern Ivanpah Valley from industrial development. Furthermore, even if an alternative is outside of BLM's jurisdiction that does not mean that it should not be considered as the DEIS notes: "Section 1502,14(c) of the NEPA regulations requires that the agency develop and evaluate reasonable alternatives that are not within the jurisdiction of the agency, and which are outside of the capability of the applicant to implement." FSA/DEIS at 4-1.

Comment ISEGS-2-9a: Agencies cannot narrow the purpose and need statement to fit only the proposed project and then shape their findings to approve that project without a "hard look" at the environmental consequences. To do so would allow an agency to circumvent environmental laws by simply "going-through-the-motions." It is well established that NEPA review cannot be "used to rationalize or justify decisions already made." 40 C.F.R. S; 1502.5; Metcalfv. Daley, 214 F.3d 1135, 1141-42 (9th Cir. 2000) ("the comprehensive 'hard look' mandated by Congress and required by the statute must be timely, and it must be taken objectively and in good faith, not as an exercise in form over substance, and not as a subterfuge designed to rationalize a decision already made.") As Ninth Circuit noted an "agency cannot define its objectives in unreasonably narrow terms." City of Carmel-by-the-Sea v. US. Dept. of Transportation, 123 F.3d 1142, 1155 (9th Cir. 1997); Muckleshot Indian Tribe v. US. Forest Service, 177 F. 3d 900, 812 (9th Cir. 1999). The statement of purpose and alternatives are closely linked since "the stated goal of a project necessarily dictates the range of 'reasonable' alternatives." City of Carmel, 123 F.3d at 11 55. The Ninth Circuit recently reaffirmed this point in National Parks Conservation Assn v. BLM, 586 F.3d 735, 746-48 (9th Cir.

2009) (holding that "[as a result of [an] unreasonably narrow purpose and need statement, the BLM necessarily considered an unreasonably narrow range of alternatives" in violation of NEPA).

The purpose behind the requirement that the purpose and need statement not be unreasonably narrow, and NEPA in general is, in large part, to "guarantee[ ] that the relevant information will be made available to the larger audience that may also play a role in both the decision-making process and the implementation of that decision." Robertson v. Methow Valley Citizens Council, 490 U.S. 332,349 (1989). The agency cannot camouflage its analysis or avoid robust public input, because "the very purpose of a draft and the ensuing comment period is to elicit suggestions and criticisms to enhance the proposed project." City of Carmel-by-the-Sea, 123 F.3d at 1156. The agency cannot circumvent relevant public input by narrowing the purpose and need so that no alternatives can be meaningfully explored or by failing to review a reasonable range of alternatives.

The BLM purpose and need states the "purpose of the proposed action is to approve, approve with modifications, or disapprove ROW applications" (referring to the three separate applications which make up the proposed project) and also states that the "need for the action has its basis in Federal orders and laws that require government agencies to evaluate energy generation projects and facilitate the development of renewable energy sources." FSA/DEIS at 2-7. The FSA/DEIS notes that an amendment to the CDCA Plan is needed in order to approve the project but does not clearly identify the plan amendment as a part of the project being evaluated. Rather, the DEIS states: "The BLM has determined that the proposed solar project and associated ROW would require an amendment to the CDCA Plan (Plan). The BLM will also consider the amendment of the CDCA Plan to allow for the project." FSA/DEIS at 2-7 (emphasis added). As a result, BLM's purpose and need is very narrowly construed to the proposed project itself and an amendment to the Plan for the project only. The purpose and need provided in the DEIS is impermissibly narrow under NEPA for several reasons, most importantly because it foreclosed meaningful alternatives review in the DEIS. See FSA/DEIS at 4-1 and discussion below regarding alternatives. Because the purpose and need and the alternatives analysis are at the "heart" of NEPA review and affect nearly all other aspects of the EIS, on this basis and others, BLM must revise and re-circulate the DEIS...

Comment ISEGS-6-4: The DEIS does identify three project objectives that are intended to reflect the Applicant's objectives and BLM's stated Purpose and Need of the Project (at pg. 2-7). These three objectives are: 1) to safely and economically construct and operate a nominal400-MW, renewable power generating facility in California capable of selling competitively priced renewable energy consistent with the needs of California utilities; 2) to locate the facility in areas of high solarity with ground slope of less than 5 percent; and, 3) to complete the impact analysis of the project by the first quarter of 20 10 so that, if approved, construction could be authorized in 2010 and beyond. The DEIS indicates that these objectives were considered in the comparison of alternatives as required under NEPA. EPA believes the purpose or objectives for this

Project should not be limited, at the outset, to potentially preclude reasonable alternatives from being evaluated in the future. Rather, an appropriately defined Purpose Statement should ultimately inform the range of alternatives and subsequent analysis and demonstrate the need for the project itself. The SDEIS should revise the Project's objectives to not restrict the Project to a specific energy output or time line, and to allow for a full evaluation of other alternatives.

Recommendation:

- Revise the Project's objectives to allow for a full evaluation of other alternatives in the SDEIS. For example, the objectives should not be so narrow as to be limited to a specific megawatt output or timeline.

Comment ISEGS-6-3: EPA believes the discussion in the DEIS regarding the purpose and need for the ISEGS Project should be expanded. As we indicated in our scoping comments, the purpose of the proposed action is typically the specific objectives of the activity, while the need for the proposed action may be to eliminate a broader underlying problem or take advantage of an opportunity.

Building upon the comment above, the Purpose and Need for a project shonld be broad enough to cover the full breadth of a reasonable range of alternatives, regardless of what the future findings of an alternatives analysis may be. It is critical that the Purpose and Need should not prescribe a solution, nor should it imply a predetermined solution, such as a specific type of renewable energy plant in a specific location that generates a specific amount of power. The Purpose and Need should focus on the underlying problems to address (e.g., lack of capacity to
serve an increasing demand for energy, or the need to develop sufficient renewable energy to meet State renewable portfolio standards) and the reasons a project is considered, and should not be written in a way that includes the solution itself. A solar thermal power plant may be an integral component of the potential solution to the problems identified in a Purpose and Need discussion; however, the Purpose and Need should allow for the analysis of a full scope of alternatives in the SDEIS, including alternative off-site locations, environmentally preferable onsite alternatives or other modes of renewable energy generation.

The ISEGS DEIS eliminates 22 alternatives from further evaluation and ultimately only analyzes the No Project and Proposed Action Alternatives in the DEIS. Such a narrow range of alternatives is, in part, influenced by the Bureau of Land Management's (BLM) narrowly defined Purpose. According to the DEIS, BLM's purpose for the ISEGS proposed action is "to approve, approve with modifications, or disapprove Rightof- Way (ROW) applications filed by (the Applicant)" (at p. 2-7). EPA understands the rationale in considering the "federal" Purpose and Need for the Project; however, EPA recommends that the SDEIS further characterize the "project" Purpose and Need as part ofBLM's statement of purpose. BLM's purpose statement should be broad enough to allow for a reasonable range of alternatives, including environmentally preferable alternatives. It is our understanding that BLM has considered otherpotential areas for future renewable

energy development, including other BLM sites, private lands and previously disturbed sites; however, BLM's purpose statement appears too narrowly focused on the potential ISEGS site, and this unduly limits the alternatives carried forward for further analysis in the DEIS.

Recommendation:

- The SDEIS should reflect a broader purpose and need statement for BLM that allows for a full evaluation, in the SDEIS, of other alternatives, including off-site locations and other environmentally preferable on-site alternatives. BLM should also consider evaluating an alternative that combines on and off site locations in the SDEIS.

Comment ISEGS-7-5: 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).

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, BLM has instead defined the Ivanpah SEGS project and other infrastructure construction itself as the goal. See FSA/DEIS at 4.5 ("to . . . construct and operate a nominal 400-MW, renewable power generating facility in California . . . in areas of high solarity with ground slope of less than 5 percent . . . [and] to complete the impact analysis of the project by the first quarter of 2010"). 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)

Indeed, the FSA/DEIS considers only two "alternatives" – the proposed action and the no action alternative. Other viable methods to effectively develop solar projects while minimizing impacts to sensitive wildlife populations and habitat, including development on private lands with lower quality wildlife habitat, development on degraded land, reductions in the size, or changes in the configuration of the Project, were not considered as alternatives in the FSA/DEIS. Because the purpose has been defined as requiring the project to be of a certain size, configuration, slope, and location, the BLM has ensured that no alternative courses of action would be considered, regardless of whether such alternatives would also meet renewable energy goals without significant environmental impacts.

Comment ISEGS-10-3: While we submit that the unreasonableness of BLM's actions here should have been obvious to many agency officials and staff, including the agency lawyers who presumably reviewed at least one administrative draft, it was made crystal clear when, less than a week after the draft's release, the Ninth Circuit handed down its opinion in National Parks Conservation Assn v. BLM, 586 F.3d 735 (9th Cir. Nov. 10,2009). In this case, the Ninth Circuit found that BLM's purpose and need was unacceptably narrowly drawn where the announced need was broader than in the Ivanpah DEIS, including "meet[ing] long-term landfill demand," and the agency considered five alternatives in addition to noaction. Id., 586 F.3d at 735.

Since release of the DEIS more than three months ago, our groups, and especially NRDC, have repeatedly urged BLM as well as the project proponent to remedy this fatal flaw through release of a supplemental EIS. We have repeatedly pointed out that the failure to even acknowledge this flaw undermines public participation in this process as well as public confidence in its eventual outcome. We remain extremely distressed that the BLM apparently intends to proceed on the basis of this unacceptable rejection of NEPA's plain language.

Comment ISEGS-33-2: Page 2-7 of the FSA/DEIS states the need for the action is based in Federal orders and laws that:

- require government agencies to evaluate energy generation facilities
- facilitate development of renewable energy sources.

Three authorities are cited:

- 'Executive order 13212 ... which mandates ... ' Please note that the order includes the clause: .. . while maintaining ... environmental protections.'
- The Energy Policy Act of 2005 (EPAct), which requires ... 10,000 MW of renewable energy ... 'The language of the act, however, treats this as a Sense of Congress, not a requirement. It should not be listed as a need for the action:...

The two valid authorities are very specific about environmental protection. Since the proposed project would essentially destroy 4000 acres of desert environment, the project is out of compliance with the orders.

Comment ISEGS-33-9: Page 4-4 states: "Eight objectives are set forth by BrightSource in its AFC.' They are then listed. Missing is the basic and fundamental underlying BrightSource objective, company profit. Without profit, BrightSource would not be here. Profit to BrightSource should be listed as an objective.

Response: *BLM has reviewed the comments regarding the Purpose and Need for the Proposed Project in the DEIS, as well as additional case law information received since the publication of the DEIS in November, 2009. In response, BLM revised the Purpose and Need text in the SDEIS to remove the constraint placed on the output of the facility. The SDEIS also added a detailed evaluation of two alternatives, including one (the*

Modified I-15 Alternative) that would require a revision to the ROW application and Plan of Development filed by BrightSource. Although BLM can sign a ROD approving a ROW grant for a project area that is not contained in the original ROW application or Plan of Development, no construction or surface disturbing activities could occur without a revised ROW application or Plan of Development. This alternative is also added to allow for a comparison of impact levels, and thus provide a better understanding of the impacts associated with the proposed project and Mitigated Ivanpah 3 Alternatives.

3.2 Consideration of Experimental Nature of Proposed Project

Comment ISEGS-2-9b: FSA/DEIS at 2-8. As the applicant admits the proposed project is experimental at the scale proposed: the applicant's objective is to "to demonstrate the technical and economic viability of Bright Source's Technology in a commercial-scale project." FSA/DEIS at 2-5. Thus, the proposed project appears to meet the DOE criteria because it is admittedly "new" - indeed, experimental - technology at the proposed scale, and the applicant hopes that it will be an improvement over other commercial technologies. However, by that same token, the FSA/DEIS fails to address the experimental nature of the project including the likelihood of success (or failure) and the consequences of failure (including technological failures and financial failures) and the full extent of the likely resulting impacts to public lands.

In discussing the cumulative scenario, the DOE loan guarantee program is also described as one of the incentive programs for funding renewable energy projects...

Comment ISEGS-1-16d: There exist many high-risk problems and assumptions associated with the project design. No power tower has ever been built on this scale, and the location presents several unresolved problems for operation and maintenance. Parts of the project are experimental and little tested. In Ivanpah 3 with five towers, saturated steam transferred in very long pipes is experimental. A 6 MW pilot project in Israel would be used to simulate ISEGS 100 MW and 200 MW plants, and this is very risky for the public to support, on public land and with taxpayer subsidies.

Comment ISEGS-1-29a: BLM and CEC recommend mitigation and minimization measures that they hope will alleviate these worries, but they pose too many risks to a healthy, functioning ecosystem and valuable recreational resource to risk. This is a very bad location to test an experimental power plant design, and the project should not be approved.

Response: *Solar technology, including power tower technology, has been tested and operates commercially on dozens of site throughout the world and in the U.S., although not at this scale. In any new technology, implementation of larger scales of development to achieve efficiency will be required, and the first of these, in all cases, will have uncertainties associated with it. What can be done is to identify where uncertainties exist, ensure that the project is monitored to obtain data regarding the uncertainty, and provide for response actions to respond to unexpected problems.*

Although not discussed within the Purpose and Need Statement, several sections of the EIS acknowledge the uncertainties associated with the fact that no solar project of this scale has ever been constructed in the U.S. Examples include the evaluation of potential stormwater damage to the facility, and the effect of power tower and heliostat glare on drivers on Interstate 15. In cases where uncertainties exist due to the lack of previous operational experience, mitigation measures have been developed that require monitoring of impacts, and response to impacts, if needed.

3.3 Inclusion of Timeframes in Purpose and Need

Comment ISEGS-2-9c: The Center is well aware that deadlines for funding, particularly for the American Recovery and Reinvestment Act ("ARRA") funds, have driven the pace of the environmental review for this project and, while we support such funding mechanisms, deadlines cannot be used as an excuse for rushed and inadequate NEPA review. The BLM and DOE must be concerned with the adequate NEPA review and even if the agencies can properly have an objective of timely approval of projects they cannot properly have as purpose and need of the project a rushed inadequate environmental impact review.

Response: *The Purpose and Need statement in the DEIS, and as revised in the SDEIS, do not specify timelines for the environmental review. The timeline discussed as a BLM objective in the alternatives section was never used as a rationale for eliminating any alternative – therefore, it has been removed from the list of BLM objectives that affect the alternative selection in the FEIS.*

3.4 Climate Change Strategies as Part of Purpose and Need

Comment ISEGS-2-9d: Moreover, in its discussion of the need for renewable energy production the FSA/DEIS fails to address risks associated with global climate change in context of including both the need for climate change mitigation strategies (e.g., reducing greenhouse gas emissions) and the need for climate change adaptation strategies (e.g., conserving intact wild lands and the corridors that connect them). All climate change adaptation strategies underline the importance of protecting intact wild lands and associated wildlife corridors as a priority adaptation strategy measure.

As the FSA/DEIS admits, building the proposed project at the proposed location "would have major impacts to the biological resources of the Ivanpah Valley, substantially affecting many sensitive plant and wildlife species and eliminating a broad expanse of relatively undisturbed Mojave Desert habitat." (FSA/DEIS p. 1-17), including, "Permanent loss of 4,073+ acres of Mojave creosote scrub and other native plant communities, including approximately 6,400 barrel cacti; permanent loss of cover, foraging, breeding habitat for wildlife; habitat fragmentation and loss of connectivity for terrestrial wildlife; disturbance dust to nearby vegetation and wildlife; increased predation due to increased raven predator presence; spread of non-native invasive weeds; and direct, indirect, cumulative impacts to special status plant species." (FSA/DEIS p. 6.2-72).

The habitat fragmentation, loss of connectivity for terrestrial wildlife, and introduction of predators and invasive weed species associated with the proposed project in the proposed location are contrary to an effective climate change adaptation strategy that the agencies also claim to support. Sitting the proposed project in the proposed location in Ivanpah Valley could undermine a meaningful climate change adaptation strategy with a poorly executed climate change mitigation strategy. The way to maintain healthy, vibrant ecosystems is not to fragment them and reduce their biodiversity.

Comment ISEGS-20-3: With regard to the long-term future of our state, renewable energy generation and the protection of critical biological resources go closely hand in hand. The greatest long-term threat to plant and animal life of all kinds – especially in the desert – is the risk of fundamental, non-reversible climate change. This threatens to eradicate entire species. If we hope to combat this effectively, we have no choice but to build clean energy sources as quickly as possible, while also increasing our energy efficiency.

Response: *As stated in the Purpose and Need statement in the DEIS, the Department of the Interior has been directed, in the Energy Policy Act of 2005 (EPAct), to approve at least 10,000 MW of renewable energy on public lands. While climate change issues have driven both Federal and State of California energy policies to encourage solar energy development, it is not the purpose of the site-specific analysis of a single solar application to evaluate these policies. Therefore, an evaluation of whether solar energy, as a whole, will achieve the renewable energy objectives of the Federal government, are outside of the scope of this EIS, and this has therefore not been added to the Purpose and Need Statement.*

Although the Purpose and Need statement has not been expanded to include a general evaluation of solar energy, the specific comments regarding the net greenhouse gas emissions of the facility are applicable. The DEIS included estimates of greenhouse gas emissions associated with the facility as an attachment to the section on air quality. In response to these and other comments, this section has been made into a stand-alone section, and revised in the FEIS to address other specific factors that impact greenhouse gas emissions.

3.5 Need for Power as Part of Purpose and Need

Comment ISEGS-6-5: Additionally, as indicated in our scoping comments, this section of the SDEIS should discuss the proposed Project in the context of the larger energy market that this Project would serve. While the DEIS states that the proposed Project "could help meet the explicit policy goals of the State of California and the Federal goals" (at pg. 2-7), the DEIS does not contain a discussion of the specific portion of Federal, State, or individual utility power provider needs that this Project would meet. We note the DEIS includes references to state and Federal renewable energy goals, highlighted by Executive Order 13212, the Energy Policy Act of 2005 and Secretarial Order 3285, as drivers for renewable energy projects such as the ISEGS. While the DEIS indicates the need for the proposed action has its basis in these Federal orders

and laws that require government agencies to evaluate energy generation projects and facilitate the development of renewable energy sources, EPA does not believe the current Purpose and Need section fully describes the specific Federal, State, and individual utility power provider renewable energy targets, timelines, and underlying needs to which BLM is responding.

Based on our review of available information, it is our understanding that BLM has received over 470 renewable energy project applications, to date, with a projected capacity of 97,000 megawatts (MW) of electricity. As the DEIS points out, the Energy Policy Act of 2005 requires the Department of Interior to approve at least 10,000 MW of renewable energy by 2015. Given that roughly 300 of the renewable energy applications BLM has received are for project locations in Region IX, EPA recommends that the SDEIS discuss whether all the applications, in total, may exceed the demonstrated Federal need for energy in 2015, 2020, and 2030, and how the ISEGS Project fits into this context.

Similarly, the SDEIS should also discuss how this Project fits into California's energy needs. We were pleased to see the discussion of state renewable goals and load growth in Appendix Air-I - Greenhouse Gas Emissions. We also note that the renewable energy projects identified in the Cumulative Scenario (at pg. 5-11) may not all be approved for reasons described on page 5-3. The discussion of Project need in the SDEIS should build upon these discussions and include the latest estimates of renewable energy needs in California and the portion this Project would fulfill. The recent estimates included in Governor Schwarzenegger's December 29, 2009 press release indicated California has 244 proposed renewable energy projects that could produce up to 70,000 MW of clean energy annually. Of the 244 projects, up to 53 are expected to apply for American Recovery and Reinvestment Act (ARRA) funding and to break ground by the end of2010. Twenty-two of these projects could generate power at utility-sized levels of larger than 200 MW, totaling more than 9,000 MW. The SDEIS should discuss how these figures relate to California's 2010, 2015, and 2020 renewable energy goals and further clarify what proportion of the State's renewable energy targets this Project would help achieve. If the ISEGS may provide power to customers in Nevada, the SDEIS should include a similar discussion of Nevada's Renewable Portfolio Standards, as well. EPA believes this context is imperative for decision makers and the public to have, in light of the large number of projects moving forward.

Presumably, some number of renewable energy facilities will be constructed pursuant to the joint Department of Energy (DOE)IBLM Programmatic Solar DEIS effort as well as the Desert Renewable Energy Conservation Plan (DRECP) process. It would be helpful to know the likely locations, construction timing, and generation capacities of such facilities relative to the proposed Project. Finally, given that Southern California Edison and Pacific Gas and Electric have apparently signed power purchase agreements for 100 MW and 300 MW, respectively (at pg. 4-8), the SDEIS should discuss the overall renewable energy targets and timelines for these utility power providers and how the ISEGS Project fits into this context.

Recommendations:

- Fully describe the specific Federal and State renewable energy targets, timelines, and underlying needs to which BLM is responding, and explain how the Project meets those needs in the context of the many renewable energy project applications in the Desert Southwest and California.
- To the extent practicable, the SDEIS should discuss how many of the total renewable energy applications received by BLM are likely to proceed pursuant to the joint Department of Energy (DOE)/BLM Programmatic Solar DEIS effort and the Desert Renewable Energy Conservation Plan (DRECP) process, and the level of energy production those applications represent.
- Include discussion of the overall renewable energy targets and timeline for Southern California Edison and Pacific Gas and Electric and how this Project would contribute to their renewable energy portfolios.
- Further describe the utility purchases of power and provide a description of how the power would be bought, sold, and used so that the reader can better evaluate the tradeoffs between resource protection and power generation.

Response: *These comments request a general analysis of the full scope of renewable energy developments efforts, including all technologies (wind, solar, wave, geothermal, biomass, etc), and including projects on both public and private lands, to determine which projects are needed to reach the renewable energy objectives of both the State of California and the Federal government. This is outside of the scope of BLM's responsibility to perform a site-specific environmental analysis in response to this particular ROW application. Also, such an analysis would require BLM to make assumptions regarding the specific intentions of individual applicants that would be difficult to determine, especially given the lack of detail provided in many of the current ROW applications. Also, such analysis would only be tentative, and would therefore not provide definitive information that could be used by BLM in making the ROW grant decision.*

4.0 CUMULATIVE IMPACTS

4.1 Eldorado Ivanpah Transmission Project

Comment ISEGS-25-2: In our comment letters (June 6, July 24, and August 28, 2009) on the transmission line project, we also notified the project applicants that Boulder City Ordinances, Nevada State Cactus and Yucca laws and other local and Nevada regulations must be reviewed to determine if the transmission line project as proposed is in compliance with those regulations.

Comment ISEGS-6-7: The DEIS indicates that "in order to accommodate the total anticipated 1,400 MW load generation by ISEGS and five other planned renewable energy generation projects in the region, the California Independent System Operator (California ISO) has indentified approximately 36 miles of transmission line within

California and Nevada that would need to be upgraded from 115 kV to 220 kV" (at pg, 3-13). EPA recommends that the SDEIS describe the current capacity of the existing transmission line. The SDEIS should also include a discussion of the existing transmission capacity compared to the future capacity after the upgrade. If excess capacity exists on the current transmission line, the SDEIS should consider an alternative that does not rely on the upgrade.

Recommendations:

- Demonstrate the independent utility of the ISEGS Project within its current geographic limits as it relates to the need for the Project. If the Project need cannot be met without future planned improvements, the scope of the Project should be expanded accordingly, such as including a full analysis of future improvements to the full extent of the planned Project, including the necessary transmission lines and how it will operate, since these would be considered connected and similar actions (40 CFR 1508.25).
- EPA recommends that the SDEIS disclose: 1) the current available capacity of the existing 115 kV transmission line; 2) the estimated capacity of the 220 kV transmission line in future years; and 3) to what degree the line is capable of accommodating additional renewable energy generated in the Project's vicinity in California and Nevada.
- Discuss whether the 400-MW ISEGS Project or a reduced sized alternative could be accommodated with the existing 115 kV transmission line. If such an alternative is feasible, BLM should include such an alternative as part of the Alternatives Analysis in the SDEIS.

Comment ISEGS-2-10a: 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 [...l or reasonable alternatives" is to consider them together. 40 C.F.R. 51508.25(a)(C). It is important for federal agencies to consider connected actions together in a single NEPA process as opposed to segmenting review. Duly 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 not proceed any further in the NEPA process for the proposed project without an analysis the direct and indirect impacts of the proposed project in conjunction with the proposed Eldorado-Ivanpah transmission line upgrade and substations that are necessary for this proposed project as well as the other proposed projects that will also connect to the same transmission line upgrade and substations. At minimum, the BLM should consider all of the impacts of the proposed project, along with the transmission upgrade and substations, and the two Silver State projects that are also on the so called "fast track" as direct impacts of a connected project. Even if these significant impacts are described as indirect effects or "secondary" or "induced" effects

attributable to the proposed project and the necessary transmission line upgrade, the need for adequate coordinated environmental review is no less. See City of Davis v. Coleman, 521 F.2d 661 (9th Cir. 1975) (requiring agency to prepare an EIS on effects of proposed freeway interchange on a major interstate highway in an agricultural area and to include a full analysis of both the environmental effects of the exchange itself and of the development potential that it would create). By failing to coordinate this NEPA process with the approval process for all of the connected actions BLM may undermine full and fair public review of the impacts of the project in violation of NEPA. BLM must disclose and consider all of the related projects' significant impacts together. To do otherwise would be unlawful. Cumulative analysis is not sufficient where projects are connected actions.

In particular, the BLM should consider together the additive impacts to biological resources, including the desert tortoise and its habitat, from the proposed solar projects and the proposed transmission line and substations 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. For example, each of these projects will have significant direct impacts on desert tortoise populations in the Northeastern Mojave Recovery Unit. 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 Northeastern Mojave Recovery Unit.

Comment ISEGS-6-6: The SDEIS should clearly demonstrate the independent utility of the Project within its current geographic limits as it relates to the need for the Project. If the Project need cannot be met without future planned improvements, such as the 36 mile transmission line between the existing Eldorado Substation in Nevada and the proposed new Ivanpah Substation in California (at pg. 3-13), the scope of the Project should be expanded accordingly, since these would be considered connected and similar actions (40 CFR 1508.25). In that case, the NEPA evaluation should include the full extent of the planned Project, including the necessary transmission lines and how it will operate. This broader scope should be applied to the identification and evaluation of project alternatives that may be less environmentally damaging. EPA believes this is the most effective way to address indirect and cumulative environmental impacts. The ISEGS DEIS indicates that a separate EIS is currently under preparation for the transmission line project (at pg. 3-13). We were pleased to note the qualitative discussion of resource impacts from the transmission line project in the Cumulative Scenario Chapter; however, if the ISEGS Project cannot meet its Purpose and Need without the transmission line project (thereby qualifying it as a connected action), the SDEIS should address both projects together, Generally, funding or constraints of

project staging and construction should not be used as a basis for segmenting the evaluation of environmental impacts under NEPA.

Comment ISEGS-31-7: During the CEC proceedings, a few commenters expressed concern regarding the application to upgrade the transmission line from Eldorado to Ivanpah (known as the "Eldorado-Ivanpah Transmission Project"), an independent project to upgrade an existing high voltage line that bisects the site, and that was proposed by Southern California Edison on May 28, 2009. The Notice of Preparation (NOP) for that project clearly identifies the project's "Purpose and Need" as follows: "The proposed project would provide the electrical facilities necessary to integrate new solar energy generation development in excess of 1,400 megawatts in the Ivanpah Dry Lake Area." (NOP, p.4.)

The BLM and the California Public Utilities Commission (CPUC) are conducting a review of Southern California Edison's Eldorado-Ivanpah transmission upgrade pursuant to NEPA and CEQA. As stated in BLM's Notice of Intent to Prepare a Joint Environmental Impact Statement and Final Environmental Impact Report for the Southern California Edison, Eldorado-Ivanpah Transmission Project; California, Nevada, the proposed transmission line would handle projected electricity produced from several renewable energy project proposals in and around the Ivanpah Valley. The project's proponent, Southern California Edison, has further noted that the project and would serve to reinforce the east-west transfer of energy, enabling renewable energy to be exported from Nevada to California and enhancing grid reliability.

Based on this information, it is clear that the transmission line upgrade is not a connected action to the ISEGS. While the Eldorado-Ivanpah Transmission Project would facilitate the ISEGS, it is an independent action that will occur regardless of whether the ISEGS is permitted, and is not necessary for the operation of the ISEGS. The ISEGS and the Eldorado-Ivanpah Transmission Project have independent utility; both projects will proceed with or without the other.

Comment ISEGS-25-1: Our program is submitting comments regarding the impacts that the transmission line project would have on mitigation areas and species of concern to the Permittees...The transmission line project as currently proposed includes new and or expansion of Rights of Way and disturbance to areas that we contend are included in and protected by the BCCE agreement...we are also concerned about impacts to the BLM's Piute Eldorado Area of Critical Environmental Concern, which is located south of the BCCE. The Piute Eldorado Area of Critical Environmental Concern, while managed by the BLM, is part of our mitigation reserve portfolio for the MSHCP. The transmission line project as currently proposed may have an impact on the MSHCP via the impacts to our mitigation areas.

Comment ISEGS-25-3: In addition, we have evaluated environmental and land use concerns within the transmission line project area which included analyzing existing information for environmentally sensitive areas, wildlife, and plant species of concern. A list of species that could be found in or near the BCCE is provided below...

Response: *BLM has reviewed the comments provided with respect to the Eldorado-Ivanpah Transmission Project (EITP), and revised the EIS to provide a more detailed description of the EITP project in the Project Description section, and included the action within the analysis of cumulative impacts in the Cumulative Scenario section. The DEIS Cumulative Scenario section included a detailed analysis specific to the EITP project, but this analysis was based only on the limited information available at that time. A joint DEIR/DEIS has now been prepared and published for the EITP project by the California Public Utilities Commission and the BLM. The FEIS for ISEGS provides summaries of the findings contained in the DEIR/DEIS for EITP.*

4.2 Other Future, Foreseeable Projects

Comment ISEGS-7-21a: Therefore, the EIS must analyze the other proposed renewable energy projects in this region, any foreseeable growth in this area, including in Primm, the foreseeable impacts of climate change, and any other reasonably foreseeable future projects.

Comment ISEGS-6-21a: EPA recommends that the SDEIS follow the guidance developed by the California Department of Transportation (Caltrans), the Federal Highway Administration (FHWA), and EPA for cumulative impact analysis, as it can be applied to non-road projects. The SDEIS and all future environmental analyses related to renewable energy, transmission, and transportation projects in the region should provide a comprehensive description of the associated elements of all foreseeable future actions. Specifically, the SDEIS should disclose to the public the cumulative impacts that are anticipated, when the impacts of the Project are considered along , with those of all of the energy projects (e.g. the 1,000 MW Cogentrix Solar Services project, the 700 MW combined NextLight solar trough projects, the 500 MW natural gas Ivanpah Energy Center, the two 125 MW Wind Energy power plant projects) and transportation projects (e.g. the DesertXpress High Speed Train System, California-Nevada Interstate Maglev Train, proposed Ivanpah Supplemental airport and its associated road network) in the Project vicinity. "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR Part 1508.7). Even if impacts from the Project, itself, are considered insignificant, the SDEIS and FEIS must address whether there are "collectively significant actions" when multiple, reasonably foreseeable projects are considered together.

Comment ISEGS-6-21b: The SDEIS should provide a substantive discussion of, and quantify where possible, the cumulative effects of the project when considered with other past, present, or reasonably foreseeable projects, regardless of what agency or person undertakes those actions (see 40 CFR Section 1508.7).

Response: *BLM has reviewed the comments provided with respect to cumulative impact analysis in the DEIS and SDEIS, including the temporal and geographic scope of other projects that may contribute to cumulative impacts, the means of performing the impact analysis, and the mitigation proposed to address cumulative impacts. The*

Cumulative Scenario section has been revised , and the cumulative impact analyses, which had previously been included in the resource-specific sections, have been combined into the revised section. By including the identification of other projects, and all resource analyses into a stand-alone section, the FEIS addresses the difficulty in tracking the projects through the DEIS.

4.3 Cumulative Analysis Methodology

Comment ISEGS-6-21c: While we acknowledge the identification of the reasonably foreseeable projects mentioned in the DEIS and the qualitative discussion of cumulative impacts in each resource chapter, the DEIS does not fully assess and quantify cumulative impacts associated with the Project, and does not adequately link the Project's effects to the health of the affected resources. Cumulative impacts are defined in the CEQ NEPA regulations as the impact on the environment that results from the incremental impact of the action when added to the other past, present, and reasonable foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such actions (40 CFR 1508.7).

Comment ISEGS-6-21d: Further, according to the DEIS, the cumulative impacts associated with the proposed Project are "a substantial contributor to the cumulative loss of Ivanpah Valley's native Mojave Desert plant and wildlife communities, including the threatened desert tortoise and other special status species" (at pg. 6.2-71). The cumulative impacts discussion in the Biological Resource chapter does not quantify the cumulative effects to, for example, desert tortoise habitat from reasonably foreseeable projects. The joint Caltrans, FHWA, and EPA guidance recommends the use of quantitative data and analysis, especially when impacts to aquatic or biological resources are involved, because such data can be critical to identifying avoidance and mitigation measures and preparing permit applications.

Comment ISEGS-6-21e: Recommendations:
Conduct a thorough cumulative impact assessment for the SDEIS. EPA recommends using the California Department of Transportation Indirect and Cumulative Impacts Analysis, which is co-authored by EPA and is applicable to impact analyses for both road and non-road projects. This guidance can be found at [http://www.dot.ca.gov/ser/cumulative_guidance/purpose.htm] and http://www.dot.cagov/ser/Growthrelated_IndirectImpactAnalysis/gri_guidance.htm). The guidance will assist in identifying cumulative impacts and preparing an analysis that is sound and well documented. The results of this analysis should be summarized in the revised Cumulative Impacts Chapter.

Comment ISEGS-27-10a: The County is interested in securing a steady source of renewable energy for its constituents, but that must be balanced with a full analysis and adequate mitigation for project impacts. Our concerns regarding the rush of renewable energy projects include a need to gain a full understanding of the cumulative picture. We do not believe the DEIS provides this.

Response: *BLM has reviewed the comments provided with respect to cumulative impact analysis in the DEIS and SDEIS, including the temporal and geographic scope of other projects that may contribute to cumulative impacts, the means of performing the impact analysis, and the mitigation proposed to address cumulative impacts. The Cumulative Scenario section has been revised , and the cumulative impact analyses, which had previously been included in the resource-specific sections, have been combined into the revised section. The revised section is included as Section 5 of the FEIS, and includes additional quantitative analysis of cumulative impacts.*

4.4 Mitigation for Cumulative Impacts

Comment ISEGS-7-21b Finally, the cumulatively significant impacts of the project, or its contribution to cumulative impacts, must be mitigated. The FSA/DEIS concedes that without mitigation the Ivanpah SEGS project would be a substantial contributor to the cumulatively significant loss of Ivanpah Valley's biological resources, including the threatened desert tortoise and other special-status species (FSA/DEIS, page 6.2-95). However, the FSA/DEIS does not address which existing measures would address the cumulatively significant impacts of the project, or whether additional measures are necessary to deal with the project's contributions to cumulative impacts.

Comment ISEGS-11-6a The cumulative impacts of the proposed ISEGS project combined with other proposed energy projects in Ivanpah Valley represent a scale of impact on functional habitat that is unprecedented in its range and pace. Cumulative impacts identified in the FSA/DEIS for the proposed project will have cumulatively considerable adverse effects to the Ivanpah Valley ecosystem as the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. The FSA/DEIS concludes that the cumulative effects of these proposed actions to the biological resources in the Ivanpah Valley will have significant, unmitigable impacts to rare plants, but falls short of requiring meaningful mitigation to address these cumulative impacts.

Comment ISEGS-6-21f: The document should also propose mitigation for all cumulative impacts, and clearly state the lead agency's mitigation responsibilities and the mitigation responsibilities of other entities.

Comment ISEGS-11-6d: Cumulative impacts to special status plants are recognized (Executive Summary, FSA/DEIS, p. 1-15) but the FSA/DEIS has failed to adequately analyze these cumulative impacts across the range of these species and ways to avoid and minimize these impacts. In addition, as noted above, the provisions for "nesting" mitigation do not ensure that the loss of the individual plants and the cumulative impacts from those losses will in fact be adequately compensated.

Response: *BLM has reviewed the comments provided with respect to cumulative impact analysis in the DEIS and SDEIS, including the temporal and geographic scope of*

other projects that may contribute to cumulative impacts, the means of performing the impact analysis, and the mitigation proposed to address cumulative impacts.

In the DEIS, the mitigation measures proposed in each resource section were developed to address not just the direct impacts, but also the indirect and cumulative impacts associated with that resource. In addition, by combining the cumulative impacts analyses in the revised Cumulative Scenario section, the FEIS also specifically evaluates whether additional mitigation measures are required.

Reduction of cumulative impacts to biological resources was also a substantial issue in BLM's decision to analyze the Mitigated Ivanpah 3 and Modified I-15 Alternatives in the SDEIS.

4.5 Growth-Inducing Impacts

Comment ISEGS-7-21c: The EIS should include a discussion of the foreseeable growth from the workers associated with this project in terms of increased housing and traffic.

Comment ISEGS-8-16a: The FSA/DEIS fails to adequately identify and analyze the cumulative impacts and the growth inducing impacts of the project which in this instance are closely tied together. While review of the Optisolar application has yet to begin, the high cost of the Eldorado-Ivanpah transmission upgrade provides a compelling economic incentive for approval of the Optisolar project, virtually ensuring yet another solar power project on prime desert tortoise habitat in the northern Ivanpah Valley. Arguably, neither project alone could amortize the cost of the proposed Eldorado-Ivanpah upgrade, which involves the construction of 35 miles of high voltage lines from California into Nevada and separate telecommunications pathways. The cumulative impacts from these two projects on the northern Ivanpah Valley are not adequately assessed and the grown inducing impacts from the approval of one project on the entire area is not adequately assessed or analyzed.

Comment ISEGS-11-6b: The FSA/DEIS fails to adequately identify and analyze both the cumulative impacts and the growth inducing impacts which in this instance are closely tied together. While review of the Optisolar application has yet to begin, the high cost of the Eldorado-Ivanpah transmission upgrade provides a compelling economic incentive for approval of the Optisolar project, virtually ensuring yet another solar power project with rare plant occurrences in the northern Ivanpah Valley. Arguably, neither project alone could amortize the cost of the proposed Eldorado-Ivanpah upgrade, which involves the construction of 35 miles of high voltage lines from California into Nevada and separate telecommunications pathways. The cumulative impacts from these two projects on the northern Ivanpah Valley are not adequately assessed and the grown inducing impacts from the approval of one project on the entire area is not adequately assessed or analyzed.

Comment ISEGS-11-6c: Cumulative impacts will convert the Northern Ivanpah Valley into a de-facto solar zone and industrial zone. The cumulative impacts to species across the zone and across the stateline into the eastern Ivanpah Valley are not adequately addressed as well as the conversion of a largely natural area – the Ivanpah Valley and dry lake area as a whole—into a largely industrialized area with more than 6 large scale solar plants, the accompanying substations and power lines, glare and heat islands that will be created across the "zone." The FSA/DEIS states that building the proposed ISEGS project at the proposed location "would have major impacts to the biological resources of the Ivanpah Valley, substantially affecting many sensitive plant and wildlife species and eliminating a broad expanse of relatively undisturbed Mojave Desert habitat." (FSA/DEIS p. 1-17), including, "Permanent loss of 4,073+ acres of Mojave creosote scrub and other native plant communities, including approximately 6,400 barrel cacti; permanent loss of cover, foraging, breeding habitat for wildlife; habitat fragmentation and loss of connectivity for terrestrial wildlife; disturbance/dust to nearby vegetation and wildlife; increased predation due to increased raven/predator presence; spread of non-native invasive weeds; and direct, indirect, cumulative impacts to special status plant species." (FSA/DEIS p. 6.2-72).

Comment ISEGS-2-35: The FSA/DEIS here fails to adequately identify and analyze both the cumulative impacts and the growth inducing impacts which in this instance are closely tied together. For example, within the Ivanpah Valley the high cost of the proposed Eldorado-Ivanpah upgrade and substations, which involves the construction of 35 miles of high voltage lines from California into Nevada and a separate telecommunications pathways could, if approved, provide a compelling economic incentive for approval of the proposed project and several other industrial scale solar projects in the same valley. In addition to proposed project and the proposed Optisolar (First Solar) project, both on the northeastern slopes of the Clark Mountains, two solar energy generation facilities are proposed by NextLight Renewable Power on 7,840 acres of public lands on the eastern side of the Ivanpah Valley (the Silver State projects) and a right of way application has also been filed for a11 additional solar project just north of the proposed airport site. Many of the affected lands within these proposals are also high quality desert tortoise habitat with intact and robust populations of desert tortoise all within the Northeastern Recovery Unit. At minimum, these and any other significant growth that could be facilitated and/or induced by the proposed project and the necessary transmission line upgrade should have been fully considered as indirect effects (or "secondary" or "induced" effects) attributable to the proposed project.

This growth inducing effect of the transmission line which is necessary for the proposed ISEGS project is essentially ignored in the DEIS. In fact, the combined projects if approved will likely create a momentum that would virtually ensure approval of the Silver State projects as well as the Optisolar project and others in this area-- several additional solar power projects on prime desert tortoise habitat in the Ivanpah Valley. Arguably, the proposed project alone could not amortize the cost of the line upgrade. The cumulative impacts from these connected proposed projects on the North Ivanpah Valley are not adequately assessed and the growth inducing impacts from the approval of these projects on the Ivanpah Valley, the CDCA, and BLM's ongoing PEIS planning is

not adequately identified, assessed or analyzed. Cumulative impacts and growth inducing impacts of the several proposed projects, if approved, would turn Ivanpah Valley into a de facto solar zone and industrial zone. The most obvious effect would be the conversion of a largely natural area - the Ivanpah Valley and dry lake area as a whole-into a largely industrialized area with more than 6 large scale solar plants, the accompanying substations and power lines, glare and heat islands that will be created across the "zone."

The DEIS limits discussion of growth inducing impacts to whether the proposed project will lead to an increase in local populations and local use of energy. FSAIDEIS at 8-4 to 8-5. This narrow view of the growth inducing impacts is grossly insufficient for a project that (along with the necessary upgrades to transmission which are also currently being proposed as a separate action and must be reviewed and approved by BLM as well) could make the Ivanpah Valley a magnet for other solar projects and convert the valley from primarily open lands and high-quality habitat into an industrial zone with the remaining habitat highly fragmented and of far less value to the tortoise and other species.

Comment ISEGS-2-5a: The FSADEIS fails to adequately address the proposed project in the context of other connected projects (including multiple solar projects, two substations and additional transmission lines) that if approved will create a de facto "solar zone" in this area undermining the ongoing PEIS planning process for solar development in six western states undertaken by BLM and DOE. As the BLM is well aware, the Ivanpah Valley area was not proposed as a solar development study area in that PEIS for either California or Nevada. Direct, indirect and cumulative impacts of the proposed project will convert the Northern Ivanpah Valley in California as well as Nevada into a de facto solar industrial zone.

Response: *The revised cumulative analysis presented in the FEIS estimates the direct, indirect, and cumulative impacts that would occur assuming that all of these proposed projects are implemented. Although this may over-estimate the impacts that will actually occur, it presents a conservative analysis, based on an assumption that the ISEGS and EITP projects will increase the likelihood of the other solar projects being developed*

4.6 Format of Cumulative Sections in EIS

Comment ISEGS-31-6a: The FSA/DEIS discusses in detail the cumulative effects of the proposed action and other past, present, and reasonably foreseeable future actions. In addition to information discussed in the FSA/DEIS, considerable additional data were developed during the CEC hearings regarding cumulative effects. As noted above, the applicant has continued its efforts to reduce to the extent practical the environmental impacts of the project, thereby reducing its cumulative effects. The Mitigated Ivanpah 3 proposal would substantially reduce impacts to the most sensitive biological areas by reducing the footprint of Ivanpah 3 by 433 acres and avoiding a portion of the northernmost site that is considered to be the most biologically sensitive. The Mitigated

Ivanpah 3 proposal would therefore further reduce the already insignificant cumulative effects associated with the project. Although the cumulatives analyses are well considered, rather than being collected in a single cumulatives analysis section they are presented at the end of the analysis of each class of impact that is analyzed. The Applicant recommends that either a separate cumulative section is presented in the Final Environmental Impact Statement, or that a guide to the location of each cumulative analysis is provided in an appendix.

Comment ISEGS-6-21g: Incorporating this thorough analysis as part of this Project will help provide the context necessary to evaluate project related impacts into the future. This analysis should be summarized as part of the Cumulative Impacts Chapter so decision makers do not have to piece together elements of the analysis from different sections of the 1,200 page DEIS.

Response: *In the DEIS and SDEIS, the analysis of cumulative impacts was separated from the Cumulative Scenario section. This led to difficulty in tracing the other existing and reasonably foreseeable future projects to their resource-specific impacts. In response, the cumulative impacts analyses that were located within the individual resource sections in the DEIS and SDEIS have been moved to a revised Cumulative Scenario section in the FEIS.*

4.7 Additional Information to Include

Comment ISEGS-31-6b: The CEC testimony, in conjunction with information presented in the FSA/DEIS, clearly defines the direct and indirect effects of the proposed action and identifies the resources, ecosystems and communities that are affected. While the cumulative effects analysis concludes that the various energy development and projects will have cumulative impacts on the environment, those effects have been fully and adequately considered in the FSA/DEIS and the records. Those effects are not substantial, particularly considering the countervailing significant energy and environmental benefits of the ISEGS. The final Environmental Impact Statement should incorporate the information developed during the CEC hearing process into the overall cumulative effects analysis.

Response: *The CEC hearing process has included a large amount of data, all of which is publicly available, but some of which may not be relevant to BLM's NEPA process. BLM will use the information that was specifically provided as part of comments made on the DEIS. The comment does not provide specific direction to which information they would like included from the CEC hearing process.*

4.8 Project-Specific versus Programmatic Analysis

Comment ISEGS-10-4: The DEIS concludes that the cumulative impacts of this project, when combined with these other projects would be significant. See, e.g., id. at 6.5-21. See also id. at 6.5-1 ("Impacts of the ISEGS project would combine with impacts

of present and reasonably foreseeable projects to result in a contribution to cumulative impacts in the Ivanpah Valley area related to land use which would be significant .... "). It does not, however, acknowledge that the net effect of approval of these proposed projects will be the creation of a de facto solar energy zone in the Ivanpah Valley and across the border with Nevada. We note with concern that the BLM did not propose all or even the California part of this area as a solar energy study area (SESAs). It did not do so even though California's Renewable Energy Transmission Initiative (RETI) had designed a competitive renewable energy zone (CREZ) in the area and even though other RETI CREZs served as the basis for a number of BLM SESAs in California. While our organizations strongly support the concept of zoning public lands for solar (and other renewable energy) development, zones that are created by accident will realize few if any of the benefits of those that are the result of a careful deliberative process. The cumulative effects of the creation of a de facto energy zone should have been analyzed. Instead and at best they were summarized very briefly.

Comment ISEGS-2-34a: The DEIS also fails to consider all reasonably foreseeable impacts in the context of the cumulative impacts analysis. See Native Ecosystems Council v. Donzbek, et al, 304 F.3d 886 (9th Cir. 2002) (finding future timber sales and related forest road restriction amendments were "reasonably foreseeable cumulative impacts"). The DEIS also fails to provide the needed analysis of how the impacts might combine or synergistically interact to affect the environment in this valley or region. See Klamath-Siskiyou Wildlands Ctv. v. BLM, 387 F.3d 989, 995-96 (9th Cir. 2004).

In this case, the proposed project is just one of at least six right-of-way applications sprawling across the Ivanpah Valley on public lands all of which will depend on the Eldorado- Ivanpah transmission line upgrades and substations which are also currently under consideration. The BLM notes the existence of the power line upgrade proposal, new substations, and the applications and acknowledges the possibility that they could all be approved but has, nonetheless, failed to provide meaningful analysis of the impacts of these projects in concert for example, the reasonably foreseeable creation of a de facto solar zone sprawling across the public lands along the border of two states. For BLM to continue the approval processes for these projects piecemeal without looking at them together in the context of landscape level land use planning, cumulative impacts, and growth inducing impacts violates the most basic requirements of NEPA. The BLM cannot lawfully ignore the obvious cumulative impacts to this landscape.

Comment ISEGS-2-5b: The cumulative impacts to species across the zone and even further across the state line into the eastern Ivanpah Valley are not adequately addressed in the planning context. Nor is the conversion of a largely natural area -the Ivanpah Valley and dry lake area as a whole-into a largely industrialized area with more than 6 large scale solar plants, the accompanying substations and power lines, glare and heat islands that will be created across the "zone" adequately addressed as in the environmental review. In fact, it is clear that piecemeal project approvals in this area will undermine the solar programmatic planning by federal agencies for the western states. This critical issue regarding planning on public lands is not adequately addressed in the FSA/DEIS which only mentions the PEIS process. FSA/DEIS at 4-11 to 4 12. The BLM

does not analyze how the PEIS could be affected by piecemeal approval of this and other projects except to note in the alternatives section that: "the appropriateness of sitting solar energy plants on various land use designations may be revisited in the PEIS." FSAIDEIS at 4-12. Such analysis after the fact is not consistent with the planning requirements of FLPMA or, indeed, any rational land use planning principles.

Response: *These comments generally request that the project-specific Ivanpah SEGS EIS either be addressed in an overall planning level context, delayed pending completion of the Programmatic Solar EIS, or be expanded to partially serve the purpose of the Programmatic Solar EIS. In general, it is BLM's preference to develop Programmatic NEPA documentation, and use it as a basis for site-specific projects, which is why the process for the Programmatic Solar EIS is occurring. However, at the same time, BLM has a responsibility to perform a timely environmental review in response to individual applications. Although the Programmatic Solar EIS has not been completed, the Ivanpah SEGS EIS has benefitted from the Programmatic process because many of the reviewers on the BLM review teams are involved with both the site-specific EIS and the Programmatic.*

5.0 CDCA PLAN AMENDMENT

5.1 Scope of Amendment

Comment ISEGS-1-32: An amendment to the California Desert Conservation Area Plan of this size should undergo its own extensive alternative review.

Comment ISEGS-8-17: The governing land use plan for the project area is the CDCA Plan as amended by the 2002 NEMO Plan Amendment.

The NEMO Plan's mitigation for Category III habitat applies to projects of less than 100 acres. NEMO at 2.27. The proposed project is over forty times the maximum acreage for projects covered under the NEMO Plan. The NEMO Plan did not address California State interests in the Northeastern Mojave desert tortoise population. The NEMO Plan does not even list CDFG as one of the agencies consulted (See NEMO Plan Chapter 7). Like the FSA/EIS, the NEMO Plan failed to address impacts to California's population of Northeastern Mojave desert tortoises. The BLM must therefore fully address impacts to the Northeastern Mojave ESU and to California's interests in the EIS.

BLM Handbook 1745 - Introduction, Transplant, Augmentation, and Reestablishment of Fish, Wildlife, and Plants - requires that "Decisions for making introductions, transplants, or reestablishments should be made as part of the land use planning process (see BLM Manual Section 1622). Releases must be in conformance with approved RMPs. A Land Use Plan Amendment must be prepared for proposed releases if management direction is not provided in the existing Land Use Plan (see BLM Manual Section 1617, emphasis added)." The proposed project and the other projects proposed for the project area will

result in large-scale movement and translocation of desert tortoises. There is no consideration in the
California Desert Conservation Area Plan as amended by the NEMO Plan for desert tortoise translocations on this scale. Therefore, a plan amendment is required to comply with BLM policy.

In addition, BLM Handbook 1745 at .1.12A requires that the activity plan be site-specific and include "Site-specific and measurable vegetation/habitat population objectives which are based on existing ecological site potential/condition, habitat capability, and other important factors. (See BLM Manual Sections 1619, 6780, and 4120)." As we discussed above, the DEIS does not adequately describe existing ecological conditions nor does it address the capability of the habitat at the translocation sites to support additional tortoises.

The BLM must adhere to its own policy and prepare an EIS that proposes and analyses an amendment to the CDCA Plan that provides the required management direction with respect to desert tortoise translocation prior to considering this project. It could then use that guidance to develop a translocation plan for desert tortoises in the project area that includes the required site specific analyses to comply with BLM policy, FLMPA, and NEPA.

Comment ISEGS-2-2: The sum total of the plan amendment to the CDCA plan is one sentence: "Permission granted to construct solar energy facility (proposed Ivanpah Solar Electric Generating System)." FSA/DEIS at 2-9. Given the impact of the proposed project on other multiple uses of these public lands at the proposed site as well as other aspects of the bioregional planning, it appears that BLM may also need to amend other parts of the plan as well and in addition should have looked at additional and/or different amendments as part of the alternatives analysis. For example, given the surveys which again confirm and provide new information on the biological richness of the area and the relatively robust tortoise population, the BLM should consider an alternative plan amendment that would designate this area as DWMA. A similar proposal was included in the NEMO plan alternatives that would have designated 29,110 acres in the Northern Ivanpah Valley as one of 4 ACECs to protect viable desert tortoise populations. See NEMO FEIS at 2- 19 (Alternative 2 -- Desert Tortoise Recovery).

As discussed further below regarding FLPMA, and in the section on NEPA and segmentation, the BLM should have taken a more comprehensive look at the plan amendment to determine 1) whether industrial scale projects are appropriate for any of the public lands in this area, 2) if so, how much of the public lands are suitable for such industrial uses given the need to balance other management goals including tortoise recovery and recreational uses, and 3) the location of the public lands suitable for such uses, if any. Rather, BLM appears to have looked at this application and others in the area (both in California and Nevada) on BLM managed lands, as well as other proposed projects, in isolation. As a result, this piecemeal approach to project review threatens to undermine the "bioregional" approach in the NEMO Plan amendment and the CDCA Plan as a whole as well as violate the fundamental planning principles of FLPMA.

Comment ISEGS-2-3b: In response to the listing of the desert tortoise and the need to conserve other listed species within the CDCA, BLM began the process of preparing management plans and plan amendments for six planning areas that together would "provide a landscape approach to managing desert ecosystems." NEMO Plan FEIS at ES-I. This so-called bioregional approach was intended to support species recovery for listed species, special status plants and animals and natural communities. Id. at ES-2. Nothing in the FSAIDEIS shows that BLM considered the landscape level issues and management objectives or meaningful alternatives to the proposed plan amendment-including an alternative that would designate this area as a DWMA. In addition, BLM should have considered the impacts to existing land use plans for these public lands across several scales including, for example: in the Northern Ivanpah Valley; in the Ivanpah Valley as a whole (across stateliness); in the NEMO planning area; and in the CDCA as a whole.

Comment ISEGS-2-4a: Because the CDCA Plan as amended by the NEMO does not provide a mechanism for grazing retirement, in order for BLM to reduce the allotment size for 50 years, it should undertake a plan amendment. When BLM does so, it must consider a range of alternatives including a no action alternative (denying the ROW application and leaving the allotment in place), retirement of part of the allotment, and/or retirement of all of this allotment. In addition, the fact that the DEIS fails to adequately identify or analyze many of the significant impacts to the tortoise population in the area from direct impacts (loss of habitat, fragmentation, take due to translocation, etc.) indirect impacts, and cumulative impacts is discussed in detail below.

In addition, there is no meaningful analysis of how the actual use of the grazing allotment might change with a large 4,000 acre fenced industrial project site set into the middle of it and the potential for increased grazing in other areas due to this displacement. Nor there any discussion of the impacts of ongoing grazing on translocation sites or, more to the point, the need to reduce grazing in those areas of the allotment after tortoises are removed from the project site under the proposed translocation plan. The DEIS for the proposed plan amendment should at minimum have included an alternative that would limit grazing in the translocation areas as well as reducing grazing on the project site itself.

Comment ISEGS-33-8: The title page identifies the document as: Final Staff Assessment and Draft Environmental Impact Statement and Draft California Desert Conservation Area Plan Amendment. I was unable to find the Draft California Desert Conservation Area Plan Amendment.

It is not in the table of contents. Page 2-8 states that a plan amendment is required, but does not show the amendment. Please identify its location or provide the text.

Response: *The CDCA Plan Amendment associated with the Ivanpah SEGS project was presented in the Introduction of the DEIS, along with a discussion of the process required to amend the Plan.*

The NEMO Plan amendment considered inclusion of the project area within the Ivanpah DWMA, and also considered Clark Mountain Grazing Allotment alternatives, and ultimately rejected the DWMA and elimination of grazing on the Clark Mountain Allotment. Analysis of a DWMA alternative would require assessment within the context of the NEMO Planning unit as a whole, and would only be considered in light of the availability of new supporting data.

6.0 GENERAL FLPMA/NEPA ISSUES

6.1 Inventory of Resources

Comment ISEGS-2-6: FLPMA states that "[the Secretary shall prepare and maintain on a continuing basis an inventory of all public lands and their resource and other values," and this "[this inventory shall be kept current so as to reflect changes in conditions and to identify new and emerging resource and other values." 43 U.S.C. 5 1711(a). FLPMA also requires that this inventory form the basis of the land use planning process. 43 U.S.C. 5 1701(a)(2). See Center for Biological Diversity v. Bureau of Land Management, 422 F.Supp.2d 11 15, 1166-67 (N.D. Cal. 2006) (discussing need for BLM to take into account known resources in making management decisions); ONDA v. Rasmussen, 451 F.Supp. 2d 1202, 1212-13 (D. Or. 2006) (finding that BLM did not take a hard look under NEPA by relying on outdated inventories and such reliance was inconsistent with BLM's statutory obligations to engage in a continuing inventory under FLPMA). It is clear that BLM should not approve a management plat1 amendment based on outdated and inadequate inventories of affected resources on public lands.

As detailed below in the NEPA sections, here BLM has failed to compile an adequate inventory of the resources of the public lands that could be affected by the proposed project (including, e.g., late summer early-fall flowering plants, bighorn movement and use, other biological resources, and cultural resources)
which is necessary in order to adequately assess the impacts to resources of these public lands in light of the proposed plan amendment and BLM has also failed to adequately analyze impacts on known resources.

Comment ISEGS-2-7: FLPMA requires BLM to "take any action necessary to prevent unnecessary or undue degradation of the lands" and "minimize adverse impacts on the natural, environmental, scientific, cultural, and other resources and values (including fish and wildlife habitat) of the public lands involved." 43 U.S.C. $5 1732(b), 1732(d)(2)(a). Without adequate information and analysis of the current status of the resources of these public lands, BLM cannot fulfill its duty to prevent unnecessary or undue degradation of the public lands. Thus, the failure to provide an adequate current inventory of resources and environmental review undermines BLM's ability to protect and manage these lands in accordance with the statutory directive.

BLM has failed to properly identify and analyze impacts to the resources including the listed and sensitive species in the project area. As detailed below, the BLM's failure in this regard violates the most basic requirements of NEPA and in addition undermines the BLM's ability to ensure that the proposal does not cause unnecessary and undue degradation of public lands. BLM failed to meet its obligations under NEPA, it also failed to protect public lands from unnecessary or undue degradation."); National Wildlife Federation, 140 IBLA 85, 101 (1997) (holding that "BLM violated FLPMA, because it failed to engage in any reasoned or informed decision-making process" or show that it had "balanced competing resource values").

Response: *In support of this EIS, BLM has worked with the applicant to conduct the full scope of resource inventories necessary to support consultation with respect to biological and cultural resources for a Federal project. In addition, BLM has required the applicant to collect additional data and perform other site-specific analyses that are not required for formal interagency consultation, but that BLM deemed necessary to allow for a full evaluation of potential impacts in all resource areas. As part of the review of the public comments on the DEIS, BLM considered each specific item to determine if such an inventory was required, or would support the impact analysis in a way which could result in a clear distinction among alternatives. As a result of this review, BLM determined that the inventory of resources associated with the proposed project was sufficient to satisfy regulatory requirements and to allow for full resource impact evaluation.*

6.2 Impact Analysis

Comment ISEGS-2-8: As detailed below, the DEIS fails to comply with NEPA in several key areas. Overall, that the FSA/DEIS provides incomplete information and appears to have been prepared in a rush rather than to be the result of adequate analysis and research regarding impacts to the environment. Moreover, the DEIS fails to meet the requirements for sufficient information in many ways and fails to include any explanation for the missing information or analysis of why it could not be obtained. As just one example, the citation to "San Bernardino County 2007" at 4.12-72 regarding identification of archeological sites is a reference to the following "San Bernardino County, 2007 [Citation from Aspen's canned cumulative analysis]" FSA/DEIS at 4.12-94 (highlighting in original). Indeed, the FSA/DEIS appears to rely heavily on "canned" analysis and conclusory statements and many critical issues have not been fully identified and analyzed in the FSA/DEIS. Moreover not all of the references are readily available and in several instances the FSA/DEIS relies on personal communications without any documentation for critical assumptions such as the success of desert tortoise translocation, ignoring other data and scientific evidence. For example, the FSA states "Mortality for translocated desert tortoise has been estimated at approximately 15 percent (Sullivan 2008)." FSNDEIS 6.2-49. The reference given is "Sullivan, C. 2008. Personal communication between Susan Sanders and Charles Sullivan, Bureau of Land Management. Wildlife Biologist, Needles Office. Meeting on November 5, 2008." No other references are discussed or provided for this critical issue. In contrast, as the Center pointed out to the Staff in our comments dated July 8, 2009, the actual mortality data from the recent translocations at Fort Irwin was over 22% in just the first year. It

does not appear that the BLM had sufficient time or made sufficient effort to obtain current information or to accurately address the issue of mortality to the desert tortoise from translocation as well as many other issues. Similarly, the FSA/DEIS cites "Jaeger 2009" for several key conclusions regarding impacts to bighorn sheep (FSA/DEIS at 6.2-46, 6.2-89), however the is no listing in the references for this citation nor is there any other information provided as to the basis of these conclusions which are stated generally to be based on "a review of the literature." The FSA/DEIS does not describe whether any surveys were conducted for bighorn or sign, the methodology and results of such surveys if any, and if no surveys were conducted the reason for that omission. Moreover, for other statements and conclusions in the FSA/DEIS no references or source material is provided at all. See, e.g., FSAIDEIS at 6.9-36 (conclusions with no references or analysis regarding impacts on seeps and springs in Clark Mountains), 6.9-45 (same).

These examples show a lack of attention to detail in preparing the DEIS and in consideration of the proposed project as well. When BLM revises the DEIS, as it must, the Center hopes and expects that BLM will remedy the errors noted as well as provide a more considered analysis of the impacts of the proposed project.

Comment ISEGS-2-12a: The EIS fails to adequately analyze the direct, indirect, and cumulative impacts of the proposed project on the environment. The Ninth Circuit has made clear that NEPA requires agencies to take a "hard look" at the effects of proposed actions; a cursory review of environmental impacts will not stand. Idaho Sporting Congress I,. Thomas, 137F.3d 1146, 1150-52, 1154 (9" Cir. 1998). Where the BLM has incomplete or insufficient information, NEPA requires the agency to do the necessary work to obtain it where possible. 40 C.F.R. 51502.22; see National Parks & Conservation Ass'n v. Babbitt, 241 F.3d 722, 733 (9th Cir. 2001) ("lack of knowledge does not excuse the preparation of an EIS; rather it requires [the agency] to do the necessary work to obtain it.")

Comment ISEGS-5-1: As an initial matter, we found the DEIS confusing, poorly organized and missing key information necessary for the public and decision makers to understand and respond to what it is the BLM is proposing to do. The agency failed to explain the analytic route it traveled from the impacts identified to the conclusions drawn. NEPA requires that an EIS be well-organized and easily understood by both "governmental decision makers and by interested nonprofessional laypersons likely to be affected by actions taken under the EIS." Oregon Environmental Council v. Kunzman, 817 F.2d 484, 494 (9th Cir. 1987). The ISEGS DEIS fails on these points, and necessitates a revision and recirculation.

The requirement that the BLM would issue a comprehensive and understandable NEPA document is
fundamental to the statute itself because NEPA is the "basic national charter for the protection of the environment." 40 C.F.R. § 1500.1. Congress enacted NEPA "[t]o promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; [and] to enrich the

understanding of the ecological systems and natural resources important to the Nation." 42 U.S.C. § 4321 (emphasis added). To accomplish these purposes, NEPA requires all federal agencies to prepare a "detailed statement" that discusses the environmental impacts of, and reasonable alternatives to, all "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). This statement is commonly known as an environmental impact statement ("EIS"). See 40 C.F.R. Part 1502.

The EIS must "provide full and fair discussion of significant environmental impacts and shall inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." 40 C.F.R. § 1502.1. This discussion must include an analysis of "direct effects," which are "caused by the action and occur at the same time and place," as well as "indirect effects which . . . are later in time or farther removed in distance, but are still reasonably foreseeable." 40 C.F.R. § 1508.8. Most relevant to these comments, an EIS must "rigorously explore and objectively evaluate all reasonable alternatives" to the proposed project," because the alternatives analysis is the "heart of the environmental impact statement." 40 C.F.R. § 1502.14.

Comment ISEGS-31-2: As part of the process required for approval by the CEC, the Applicant has submitted a wealth of data and analysis relating to the technical aspects of the project, as well as reasonably foreseeable environmental impacts of the project. Much of the information submitted to the CEC was in response to specific data requests issued as part of the CEC application process. The Applicant has provided the Bureau with a copy of portions of the hearing record of the CEC proceedings, which includes relevant information submitted by the Applicant and CEC staff as part of those proceedings, under separate cover. The Applicant believes that this information provides relevant and useful data and analyses that should be incorporated by the BLM into its administrative record.

Comment ISEGS-2-1b: The Center for Biological Diversity (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.

Unfortunately, the DEIS for the proposed plan amendment and right-of-way application fails to provide adequate identification and analysis of the significant impacts to the desert tortoise, rare plants, other biological resources, cumulative and growth inducing impacts of the project, and lacks consideration of a

reasonable range of alternatives. In addition, BLM has failed to fully examine in impact of the proposed plan amendment (and other similar proposed plan amendments) that would result in industrial sites sprawling across the California Desert within habitat that should be protected to achieve the goals of the bioregional plan as a whole.

Comment ISEGS-2-1c: As proposed the proposed project will cover approximately 4,073 acres (approximately 6.4 square miles) of Mojave desert scrub that is prime habitat for the federally and state threatened desert tortoise and a suite of other rare plant and animal species. In the sections that follow, the Center provides detailed comments on the ways in which the DEIS fails to adequately identify and analyze many of the impacts that could result from the proposed project, including but not limited to: impacts to biological resources, growth inducing impacts alternatives and cumulative impacts. In addition, if undertaken as proposed, this industrial project is inconsistent with local planning and zoning laws, the Endangered Species Act ("ESP), the Federal Land Policy Management Act ("FLPMA"), the California Desert Conservation Act ("CDCA"), and other laws, ordinances, regulations and standards.

Response: *The analysis of impacts in the EIS has identified many resource areas in which direct, indirect, and cumulative impacts were disclosed. These include biological resources, soil and water resources, visual resources, and traffic, among others. In each case where an impact was identified, BLM evaluated and proposed mitigation measures that would eliminate or reduce the magnitude of the impact. BLM also evaluated more than 20 potential alternatives, and performed a resource-by-resource evaluation of several of them to determine if they were likely to result in reducing impacts.*

BLM has also reviewed the above comments, as well as all of the specific technical comments made on the resources sections, to determine if changes would be appropriate. In all cases, the comment and the associated text was reviewed, and in many cases, revisions were made to the text in the FEIS to make corrections or provide clarification. These changes have improved the impact analysis in the EIS, and the comments are appreciated. However, none of these changes in the FEIS has resulted in a substantial revision of the impacts, as they were discussed in the DEIS and SDEIS.

7.0 FEDERAL, STATE, AND LOCAL REGULATIONS

7.1 Compliance with Regulations

Comment ISEGS-30-17: The EIS should address how the project will fully comply with County, State, and Federal laws and regulations.

Response: *The discussion of the applicability of, and conformance with, Federal, State, and local regulations is provided within each resource-specific section in the DEIS.*

7.2 Scope of Regulations

Comment ISEGS-30-18: We request that the California Desert Protection Act of 1994 (CDPA) be added to the list of Laws, Ordinances, Regulations, and Standards (LORS) that are used to determine federal, state and county compliance with established law. This pertains to all applicable sections, but specifically to Mitigation and Cumulative Impact, Visual Resources, and Air Quality.

Response: *The California Desert Protection Act does not apply to BLM's environmental review and administration of the proposed action and alternatives.*

7.3 Coordination with Local Agencies

Comment ISEGS-27-10b: The County should always be included where the applicant is required to submit materials and documentation.

Response: *BLM has reviewed the Mitigation Measures, and verified that the County is listed as a recipient on all documentation for which the County has a permitting role.*

8.0 MITIGATION MEASURES

8.1 Associated Analysis

Comment ISEGS-2-26a: Because the DEIS fails to provide adequate identification and analysis of impacts, inevitably, it also fails to identify adequate mitigation measures for the project's environmental impacts. "Implicit in NEPA's demand that an agency prepare a detailed statement on any adverse environmental effects which cannot be avoided should the proposal be implemented,' 42 U.S.C. 5 4332(C)(ii), is an understanding that an EIS will discuss the extent to which adverse effects can he avoided." Methow Valley, 490 U.S. at 351-52. Because the DEIS does not adequately assess the project's direct, indirect, and cumulative impacts, its analysis of mitigation measures for those impacts is necessarily flawed. The DEIS must discuss mitigation in sufficient detail to ensure that environmental consequences have been fairly evaluated." Methow Valley, 490 U.S. at 352; see also Idaho Sporting Congress, 137 F.3d at 1151 ("[without analytical detail to support the proposed mitigation measures, we are not persuaded that they amount to anything more than a 'mere listing' of good management practices"). As the Supreme Court clarified in Robertson, 490 U.S. at 352, the "requirement that an EIS contain a detailed discussion of possible mitigation measures flows both from the language of [NEPA] and, more expressly, from CEQ's implementing regulations" and the "omission of a reasonably complete discussion of possible mitigation measures would undermine the 'action forcing' function of NEPA."

Although NEPA does not require that the harms identified actually be mitigated, NEPA does require that an EIS discuss mitigation measures, with "sufficient detail to ensure that environmental consequences have been fairly evaluated" and the purpose of the

mitigation discussion is to evaluate whether anticipated environmental impacts can be avoided. Methow Valley, 490 U.S. at 351-52. As the Ninth Circuit recently noted: "[a] mitigation discussion without at least some evaluation of effectiveness is useless in making that determination." South Fork Band Council of Western Shoshone v. DOI , 588 F.3d 718 , 727 (9th Cir. 2009) (emphasis in original).

Here, the DEIS does not provide a full analysis of possible mitigation measures to avoid or lessen the impacts of the proposed project and therefore the BLM cannot properly assess the likelihood that such measures would actually avoid the impacts of the proposed project.

Comment ISEGS-2-12b: Moreover, BLM must look at reasonable mitigation measures to avoid impacts in the DEIS but failed to do so here. Even in those cases where the extent of impacts may be somewhat uncertain due to the complexity of the issues, BLM is not relieved of its responsibility under NEPA to discuss mitigation of reasonably likely impacts at the outset. Even if the discussion may of necessity be tentative or contingent, NEPA requires that the BLM provide some information regarding whether significant impacts could be avoided. South Fork Band Council of Western Shoshone v. DOI, 588 F.3d 718 ,727 (9th Cir. 2009).

Comment ISEGS-8-1b: The DEIS fails to identify, document and analyze specific mitigation measures. Based on our review of the BLM's DEIS, it seems unlikely that the general mitigation measures proposed would reduce the environmental impacts of the proposed action to less than significant.

Comment ISEGS-33-7: The FSA has many references to the Energy Commission Compliance Project Manager (CPM). I cannot find in the FSA where this position is defined. Is it missing, or did I miss it?

Response: *In response to these and other public comments, BLM reviewed the manner in which mitigation measures were identified and proposed in the DEIS and SDEIS. In the DEIS, these were generally identified jointly as CEC Conditions of Certification/ BLM Mitigation Measures (except in a few instances where it was specifically stated that a requirement was specifically proposed to address only a Federal or State law or policy). The DEIS proposed more than 135 of these individual mitigation measures, including several that were very detailed in their requirements. An additional six mitigation measures were identified as part of the biological resources analysis in the SDEIS – these additional measures would be applicable to the proposed project, as well as the alternatives evaluated in the SDEIS. Also, BLM did not fail to evaluate mitigation for issues that had uncertainties – in contrast, several of the measures (see SOIL&WATER-5 and TRANS-4) were specifically developed because uncertainties existed, and the agency developed a mitigation measure intended to monitor the potential impact. For each impact identified, the text of the DEIS either proposed a specific mitigation measure, or explained why no mitigation of the impact was possible.*

Where specific public comments have made specific suggestions on how a proposed mitigation measure could be improved, or where an additional measure could be warranted, and the agency has concurred that the recommended modification would be effective and reasonable, the agency has modified the text in the FEIS. However, based on the review of the measures already proposed, we conclude that the development of mitigation measures was sound.

8.2 Nesting

Comment ISEGS-2-26b: To the extent the DEIS discusses some mitigation measures, the proposal to "nest" mitigation measures undermines much of that discussion. The DEIS proposes to mitigate impacts for desert tortoise by land acquisition and management, however, that same mitigation is proposed to also mitigate for several of the impacts to other rare species as well as impacts to surface waters (or waters of the State) through "nesting" of mitigation. While some of these mitigation issues pertain primarily to protections afforded by the State (i.e., for waters of the State) it is important to carefully analyze whether within that structure the BLM's proposed 1:1 mitigation for tortoise will adequately mitigate for other resources of these public lands that will be lost should the project be approved as proposed. It is possible that once the acquisition lands are identified and surveyed, this strategy could achieve mitigation for some aspects of the various impacts, however, it is unlikely that it will actually adequately mitigate for impacts to a number of the species, the loss of alluvial fan habitat, or all of the losses the waters of the State that will be potentially impacted by the proposed project. For example, if mitigation lands are acquired for conservation and they are good desert tortoise habitat, they still may not support the same suite of rare, sensitive plants, or similar alluvial fan habitat important to bighorn populations in order to effectively mitigate for the impacts of the proposed project on those resources. Very careful selection of mitigation lands will need to be done, and additional lands over and above the 1:1 ratio now proposed for desert tortoise by BLM may be required in order to properly mitigate for the loss of other resources of these public lands that the proposed project will affect.

Comment ISEGS-1-36a: Mitigation: The compensatory mitigation plan for tortoises relies on so called “nesting” to provide compensatory mitigation for loss of habitat and individuals for multiple plant and animal species. Because the plan described in the FSA/DEIS only addresses desert tortoise habitat, it may in fact be inadequate to provide for the mitigation needs of the many other species that will be impacted by the project. We believe that the Energy Commission and BLM must revisit this issue and explain how the so-called “nesting” of mitigation actually provides for compensatory mitigation for each species of rare or sensitive plant and animal, including listed species as well as Gila monster, burrowing owl, nesting bird species, badger, and Nelson bighorn sheep.

Response: *The only BLM mitigation measure that required compensation by land acquisition and management is that specified within the NEMO Plan amendment, which is the 1:1 compensation for Category 3 desert tortoise habitat. Requirements for*

compensation for other species and Waters of the State are the responsibility of the State of California.

9.0 PROJECT SCHEDULE

Comment ISEGS-1-14: Due to the outstanding unresolved issues that this project has instigated, we would like to request that the deadline for the FSA/DEIS be extended into April, 2010.

We believe it is unwise for the BLM to be using "fast tracking" seemingly to expedite approval of this project. We feel that there are enough outstanding unresolved issues that make approval and construction of facilities by fall of 2010 a very unrealistic goal. We would like to request that this project be removed from the fast track list in order to provide us with more time to examine the issues. We think a more realistic goal for the EIS process should extend into the year 2012, so more comprehensive biological and cultural site surveys can be conducted.

Comment ISEGS-31-8: The Applicant requests that the comments set forth above be addressed in the NEPA review for the ISEGS project. Timely completion of the NEPA process will determine whether this project can be approved and developed in accordance with the ARRA deadlines and the Secretary's policy objective for renewable energy development. The Applicant appreciates BLM's efforts to complete a timely review of the ISEGS application, and stands ready to provide additional information regarding the proposed project.

Response: *BLM appreciates that all parties have an interest in the timing of the completion of the FEIS and BLM's ultimate decision regarding granting of a ROW. Because this environmental review was conducted, at least partly, as a joint process between BLM and the CEC and cooperatively with the Department of Energy, the individual schedule needs of the three agencies, the applicant, the intervenors, and other interested parties has created continual schedule pressures, and in contradictory directions.*

The development of this particular EIS has been an iterative process in which the agencies have reviewed the applicant's plans, the applicant's plans have been revised as part of their preliminary project design efforts and to develop means to reduce impacts, and then agency reviews have been conducted again. The EIS has been a part of the joint review process with the CEC, and then de-linked from it again. Given these complications, the completion of the FEIS has been timely, and also allowed for full evaluation of the proposed project and alternatives.

10.0 MOJAVE NATIONAL PRESERVE

Comment ISEGS-9-2: We understand that the BLM is contemplating preparing a supplement to the current DEIS to address the lack of sufficient alternatives. We think such a step is warranted. It also presents a means for the bureau to fully address the potential impacts associated with the project on Mojave National Preserve and options for mitigating those impacts.

We recommend that the bureau does so through the inclusion of a separate section dedicated to the park in the supplement. Impact topics that need more analysis include: the potential loss of tortoise habitat and how that loss affects the recovery actions in the recovery unit located in the park; air quality; bighorn sheep seasonal migration routes from the park to Clark Mountain for lambing; invasive species; plant species; soundscapes; night skies; management of displaced livestock, including potential impacts to the park; and cumulative impacts on the park from this project and other reasonable foreseeable projects in the vicinity of the park. We would like to work closely with the bureau as it carries out the park related analysis in the supplement. We have both park and nationally recognized subject matter experts that can be of assistance.

Comment ISEGS-30-3: Impacts to Mojave National Preserve have not been fully explored within the DEIS process. NPCA requests that an amendment be issued that determines both the individual and cumulative impacts to Mojave National Preserve.

Comment ISEGS-9-1: We commend the Bureau for its cooperative approach with the State of California to jointly evaluate the environmental implications of the Ivanpah Solar Electric Generating System. The document contains a lot of helpful information. However, it lacks an adequate analysis of potential impacts to Mojave National Preserve and options for mitigating those impacts, including possibly shifting site locations of the various phases of the development to avoid and/ or reduce impacts to the park. For example, the document appears to fully evaluate the implications of the project on the local golf course and the nearby town of Primm, Nevada, but does not apply a similar level of analysis to the preserve, which is a nationally recognized and protected treasured landscape.

In establishing Mojave National Preserve in 1994 as a park unit, Congress specifically directed that it be administered in accordance with the laws applicable to the National Park System. The Congress also noted that the new park unit "possesses outstanding, natural, cultural, historical, and recreational values ... " As a result, protecting the resources and values of the preserve needs to be fully examined in the document along with ways to mitigate impacts.

Comment ISEGS-30-11: Cumulative impacts from loss of grazing acreage. Will the loss of grazing acreage for burros, cattle, and wild horses force those species onto the Clark Mountain area of Mojave National Preserve? Will this diminish available resources for herbivores, including desert bighorn sheep? We request that cumulative impacts including updated DesertXpress train routes be considered in the cumulative analysis

on the impact to Clark Mountain exclave by the loss and fragmentation of cattle, wild horse, and burro acreage adjacent to Clark Mountain.

Comment ISEGS-30-2: When considering these recent planning developments, along with the environmental costs of ISEGS' preferred alternative, cumulative impacts to the Ivanpah Valley, and impacts to Mojave National Preserve, the question must be asked—is this project sited in the right place?

NPCA requests that the BLM consider the impact of approving the first large-scale solar project in California sited outside of an identified Solar Energy Study Area and in a pristine, biologically diverse location that will degrade the federally protected resources of Mojave National Preserve.

In reviewing available information relating to ISEGS, NPCA has determined that processes associated with the construction and the operation of ISEGS are incongruous with the protections awarded to the adjacent Mojave National Preserve. These include ISEGS disrupting Mojave National Preserve's scenic viewshed, the import of light pollution, disruption of the natural soundscape, blocking or limiting access to recreation in Clark Mountain exclave, diminishing wilderness and national park experiences for Mojave National Preserve visitors, adverse impacts to federally listed wildlife species and to critical wildlife habitat, adverse impacts to air quality, and continued water drawdown in the already over-allocated Ivanpah Valley.

NPCA is aware that the DEIS process represents the final opportunity to present alternatives and correct staff and consultant analysis made in this process. NPCA requests that the following issues be thoughtfully considered and addressed though the EIS process. Amendments should be offered where appropriate.

Response: *Throughout the DEIS, SDEIS, and FEIS, BLM has included the evaluation of receptors within the Mojave National Preserve in its impact analyses. This has included wildlife within the Preserve which might enter the proposed project property, air emissions from the facility, and visual and recreational impacts to persons within the Preserve. That analysis has concluded that, in some cases, impacts will occur. Although most of these impacts can be mitigated, others, such as visual impacts to hikers within certain portions of the Preserve, cannot be. BLM has considered these impacts in its selection of a Preferred Alternative in the FEIS, and looks forward to continuing our dialogue with the Preserve as we develop a final decision on the ROW grant.*

In response to this comment, BLM considered moving the discussions of the impacts to receptors within the Preserve to a stand-alone section. However, this would result in dissecting the existing analyses – for instance, some biological analyses would be in the Biological Resources section, and some would be in the Preserve section. The same thing would happen with visual resources. It is possible that a stand-alone section could be provided to summarize the Preserve impacts in a single location, while keeping the resource discussions intact – however, this would result in taking the impact discussions out of context, which presents its own risks.

After considering the pros and cons of developing a stand-alone section, BLM determined that the impacts to the Preserve are best presented within the resource sections.

11.0 AIR QUALITY

11.1 Air Quality

Comment ISEGS-9-5: Section 6.1 - Air Quality -- The DEIS includes an air quality analysis that evaluates emissions from project construction, operation and overlap time periods. The analysis also includes an AERMOD dispersion modeling run for each of these emission scenarios. However, the NPS is concerned that the analysis does not evaluate the air quality impacts to sensitive resources such as Mojave National Preserve. Because the project is so close to the Preserve, the modeling analysis should have included AERMOD receptors in the park and reported the concentration impacts at these receptors in the document . The document also should have included visibility and deposition modeling analyses. Fugitive dust emissions and primary pollutant emissions from construction equipment and point sources have the potential to impact visibility at the park.

The near-field visibility screening model, VISCREEN, should have been run to evaluate visibility effects in Mojave National Preserve. Further, recent studies evaluating the effects of nitrogen deposition in both Mojave National Preserve and nearby Joshua Tree National Park indicate that nitrogen deposition may be causing negative effects to these ecosystems. These effects include changes in species composition and exacerbation of increased growth of non-native exotic species due to the additional atmospheric nitrogen inputs. Further, studies at Joshua Tree NP found that the nitrogen deposition related increases in non-native vegetation significantly increase risk of more frequent wild fires, beyond historical fire return intervals for these systems. For this reason, the air quality section should include a deposition analysis for Mojave National Preserve. The newest EPA approved regulatory version of AERMOD (version 09292) now includes deposition algorithms . The NPS also provides guidance on how to conduct visibility and deposition analyses in our Federal Land Managers Air Quality Related Values Workgroup (FLAG), and our Deposition Analysis Threshold (DAT) guidance documents. We recommend that the analysis is updated to include visibility and deposition impacts at Mojave National Preserve following the NPS provided guidance. Additionally, while we are pleased that the analysis included modeling results using the EPA approved regulatory model for short range transport, we believe the analysis is lacking significant documentation of the assumptions that were used to develop emission estimates and modeling inputs. These concerns are outlined in detail below.

***Response**: We understand the NPS concern regarding the Mojave National Preserve, but there are a number of reasons why visibility modeling were not performed for the analysis of project impacts, including the following:*

- *The project is a minor source and does not trigger Prevention of Significant Deterioration (PSD) permitting and associated visibility modeling analysis requirements, and there are no other regulatory requirements to perform visibility modeling.*
- *Even if the project were a major source triggering PSD permitting there are no Class 1 Areas located within 100 km of the site, the Mojave National Preserve is not a listed Class 1 Area, so again visibility modeling would not be triggered.*
- *The facility's maximum permitted stationary source emissions of NOx, PM, and SOx are less than 12, 6 and 2 tons per year; the predominate wind patterns in the site area are directly away from the Mojave National Preserve; and the maximum project impacts all occur well east and outside of the portion of the Clark Mountain portion of the Preserve and north of the project site well away from the main portion of the Preserve, which when considered together are enough to conclude that the Mojave National Preserve will not be significantly impacted from the ISEGS project.*

Considering these regulatory and technical issues a visibility modeling analysis for the Mojave National Preserve is not considered necessary.

Also, please see the responses to Comment ISEGS-9-6 and ISEGS-9-7 below.

Comment ISEGS-9-6: Page 6.1-3, Table 6 - This Table depicts the estimated emissions for project construction, both on a daily basis and on an annual basis. More information should be provided on the assumptions used to derive these estimates, particularly for PM10, NOx and VOCs due to the nonattainment issues for these pollutants in the region. For instance, were estimates of acres disturbed, miles of road, level of activity, soil characteristics, etc. used to develop PM10 emission estimates for fugitive dust? What types of construction equipment were assumed, what emission factors (i.e. AP-42) were used for the various types of equipment? The document should disclose the specific data sources and assumptions that went into developing these estimates. Further, it is unclear how the annual emission estimates were derived from the daily maximum estimates. For instance, if one assumes 365 days in a year, the annualized emissions reported in Table are much lower than what would be anticipated based on the daily emissions (52 tons / year for PM10 vs. 24.5 reported in Table 6). If the analysis assumed that construction emissions would not occur each day of the year, the document should also disclose these assumptions.

***Response**: The emission estimate methods and assumptions documentation is included with the AFC materials and data response materials available on the California Energy Commission website at the following address:*

http://www.energy.ca.gov/sitingcases/ivanpah/documents/index.html

The SA/DEIS provided explicit reference sources under the emission estimate tables and the SA/DEIS reference list included the reference names, docket numbers, and dates of receipt for parties to be able to find and review this information.

Specifically, the methodology, data and assumptions used by the applicant to develop emissions estimates for the construction phase of the project are presented in Appendix 5.1F, Attachment 5.1F-1 of the AFC, and Data Response, Set 1D (Air Quality Data Requests 8 and 9). The types (e.g., bulldozer, scraper, water truck, pick-up truck, etc.) and number of equipment by month over the proposed construction schedule for ISEGS 1, 2 and 3 are presented along with estimates on the level of activity and emission factors. Maximum short term emissions estimates are based on the equipment mix and activity levels during Month 12. Annual emission estimates are based on the average equipment mix during the peak 12-month period out of the overall project construction period. Per Attachment 5.1F-1, annual emissions were calculated from average daily emissions assuming construction activities would occur 255 days per year.

Comment ISEGS-9-7: Page 6.1-13 - This page states that the "onsite fugitive dust emissions estimate may be underestimated given the amount of activity on the site and appropriate level of control for the applicant's proposed mitigation measures (specifically unpaved roads)." If the staff has reason to believe that the emissions for this important pollutant have been underestimated, how can it be certain that the proposed mitigation measures are effective in reducing emissions below the conformity de minimums levels, or that the modeling analysis adequately reflects impacts to the National Ambient Air Quality Standard for PMI0 in the region? This should be clarified in the analysis.

Additionally, no specific information on the AERMOD modeling analysis was provided . For example, the extent of the modeling domain was not identified, how far did it extend from the project area? Were discrete receptors included in sensitive areas such as Mojave National Preserve to evaluate the impacts to these places? The modeling inputs for emission sources, meteorological data sources, etc. were not described in detail. While modeling inputs for the point sources, such as stack parameters, were identified in the document, this information was not provided for the area source emissions, such as emissions from construction. More information should be provided identifying how emissions from construction activities were input into the model. Finally, the document does not specify what results are reported in Tables 9, 10 and 11. Are these the maximum concentrations modeled for the domain, or are they the high second high concentrations? Where do these impacts occur relative to the project area? This information should be disclosed in the document.

***Response**: Part 1. In the SA/DEIS it was noted that the applicant's estimate, with the specific control assumptions assumed by the applicant, may underestimate emissions. However, it was also indicated that with BLM's recommended mitigation measures, specifically the use of soil stabilizers on any unpaved roads and inactive construction areas, the overall emissions estimated for the project are reasonable. Considering the overall length of the construction schedule and recommended mitigation measures it is clear that the annual PM10 emissions would not exceed the general conformity de*

minimus level of 100 tons per year from construction or operation. The modeling analysis also indicates that the project impacts would not cause new exceedances of the federal PM10 standards.

Part 2. The air dispersion modeling methods and assumptions documentation is included with the AFC materials and data response materials available on the California Energy Commission's project website at the following address:

http://www.energy.ca.gov/sitingcases/ivanpah/documents/index.html

The SA/DEIS provided explicit reference sources under the modeling result impact tables and the SA/DEIS reference list included the reference names, docket numbers, and dates of receipt for parties to be able to find and review this information.

The specific information describing the AERMOD modeling methods and assumptions is provided in the AFC and Data Response Set 1D (Air Quality Data Requests 8 and 9). The details on the air quality modeling inputs and analyses are presented in Appendices 5.1D, 5.1F and 5.1I. The modeling domain (i.e., receptor grid) extended a minimum of 5 kilometers in each direction from the project fence line. The receptor grid did not include any receptors in the main part of the Mojave National Preserve which is over 5 kilometers south from the project site, but did include receptors approximately 1.6 kilometers into the eastern boundary of the small Clark Mountain portion of the Preserve. The applicant used hourly surface meteorological data from Jean, Nevada located 16 miles from the project site and upper air data from the Desert Rock, Nevada station located 70 miles from the project site. Appendix 5.1F presents the details for the construction emissions. The applicant grouped the construction emission sources into three categories: exhaust emissions, construction dust emissions and windblown dust emissions. The exhaust and construction dust emissions were modeled as volume sources. The windblown dust emissions were modeled as an area source. The project impacts in Tables 9, 10 and 11 are the maximum modeled impacts. In general, due to the relative low release heights for the modeled sources, the maximum modeled impacts occur at the project fence line.

Comment ISEGS-9-8: Pages 6.1-21, 6.1-24 and 6.1-25 - This section states that "[t]he modeling analysis shows that, after implementation of the recommended fugitive dust mitigation measures, the project's construction is not predicted to cause violations of the NAAQS. Therefore, no significant NEPA impacts would occur after implementation of the fugitive dust mitigation measures." It is unclear whether the results in Tables 9, 10 and 11 reflect these additional recommended mitigation measures, or if this information is omitted from the document. This should be clarified, and if necessary, any results of additional modeling which reflect mitigation options should be included. Conversely, if the modeling results for the tables reflect impacts after applications of the additional mitigation options, the results without these mitigations should also be disclosed in the document.

The analysis evaluates emissions related to construction, project operation and overlap periods where project operation and construction are ongoing simultaneously. It is unclear whether the project operation and overlapping analyses considered ongoing fugitive dust emissions related to wind erosion of disturbed area, access and maintenance vehicles and other continued sources of dust emissions. This should be clarified in the document. Further, if ongoing fugitive dust emissions beyond the construction phase were not considered in the analysis, the modeling analysis should be rerun, with these emissions included.

***Response**: The SA/DEIS specifically notes the following:*

> "Staff has recommended additional mitigation measures, specifically the use of soil binders on unpaved roads and other inactive disturbed surfaces during construction, so that the applicant's fugitive dust emissions estimate and associated impact analysis will be reasonable for this project."

It was BLM's determination that the recommended fugitive dust mitigation, specifically the use of soil binders, would provide a control efficiency equivalent to that assumed by the applicant in their construction emission calculations. This means that the applicant's estimates, which for fugitive dust emission are clearly mitigated emission estimates, are considered valid and the associated modeling impact analysis are based on a reasonable mitigated emission estimate for the project.

As noted previously the specifics of the applicant's emission estimate are available in the AFC and data response documents available on the California Energy Commission website at the following address:

http://www.energy.ca.gov/sitingcases/ivanpah/documents/index.html

Comment ISEGS-30-4: Deterioration of air quality within the Clark Mountain enclave and other points within Mojave National Preserve. Poor air quality can adversely affect the health of outdoor recreational users, decrease and diminish visual resources, reduce and diminish night sky viewing opportunities, and adversely affect ecosystems, encouraging the spread of invasive plants.

***Response**: The impact analysis did not find significant localized impacts, so impacts to areas more removed than the local air dispersion modeling domain, used to determine maximum project pollutant concentration impacts, would be much lower than the maximum project impacts.*

Comment ISEGS-2-30: The FSA/DEIS fails to adequately address several air quality issues including but not limited to PM10. Of particular concern is that plans to minimize air quality impacts from construction, operations, and decommissioning are all deferred to later development with no clear standards.

***Response**: The EIS proposes three mitigation measures (AQ-SC3, AQ-SC4, and AQ-SC7) that provide a detailed list of BMPs to address fugitive dust, with the stated objective of preventing all fugitive dust plumes from leaving the project. By necessity, these plans must be developed in parallel with the applicant's detailed project design, and will likely require revision as lessons are learned during project construction. The mitigation measures specify the objectives, general procedures, and standards to be met.*

Comment ISEGS-1-22: Without adequate fugitive dust mitigation, the project would have the potential to exceed the General Conformity PM10 (particulate matter) applicability threshold during construction and operation, and could cause potential localized exceedances of the PM10 levels during construction. This potential exceedance of federal air quality standards would be considered a direct, adverse significant impact under NEPA.

What long-term effects will removing 4,000 acres of topsoil have on the air quality of the region? Erosion from clearing is likely to substantially increase the amount of particulate matter that will be airborne during strong wind events. How much water will be used to control dust during construction? Over-runs of estimated water use because of excessive dust is a potential problem.

Comment ISEGS-22-4: During construction and later (all ground cover will be scraped away) dust will be a problem, even greater than it is now. I have seen walls of dust for hours in that area without any surface disturbance projects. This project will make it worse. And the wind does blow, hence all the wind turbines plan in the area.

***Response**: The air quality evaluation performed by the applicant, and used to support the DEIS, assumed a worst-case scenario in which all vegetation would be removed, and the entire site graded. The applicant has changed that plan, and now intends to minimize grading and cut vegetation rather than remove it. In addition, the applicant proposes to follow mitigation measures from the South Coast Air Quality Management District CEQA Guidelines, which have been incorporated into Mitigation Measures AQ-SC1 to AQ-SC-5 in the DEIS. In addition, the agency has required implementation of Dust Control Plans during both construction and operations phases.*

Comment ISEGS-2-22: The proposed project is located in the Mojave Desert Air Quality Management District area, and is already in nonattainment for PM-10 particulate matter. The construction of the proposed project further increase emissions of these types of particles because of the disruption and elimination of potentially thousands of acres of well-developed cryptobiotic soil crusts. Cryptobiotic soil crusts are an essential ecological component in arid lands. They are the "glue" that holds surface soil particles together precluding erosion, provide "safe sites" for seed germination, trap and slowly release soil moisture, and provide C02 uptake through photosynthesis. The proposed project site has well developed cryptobiotic soil crusts, which currently hold soils in place.

The proposed project will disturb an unidentified portion of these soil crusts and cause them to lose their capacity to stabilize soils and trap soil moisture. The DEIS fails to provide a map of the soil crusts over the project site, and to present any avoidance or minimization measures. It is unclear how many acres of cryptobiotics soils will be affected by the project. The FEIS must identify the extent of the cryptobiotic soils on site and analyze the potential impacts to these diminutive, but essential desert ecosystem component as a result of this project.

***Response**: Mitigation Measures AQ-SC3 and AQ-SC4 in the DEIS provide significant construction phase fugitive dust control requirements, well above those required by the rules and regulations of the local air quality district, and AQ-SC2 requires an onsite air quality mitigation compliance manager who will assure mitigation is performed to meet the required performance standards. The agency has also required implementation of a Dust Control Plan (AQ-SC7) during the operations phase that has equivalent performance standards to those required during construction. Also, the air quality evaluation performed by the applicant, and used to support the DEIS, assumed a worst-case scenario in which all vegetation would be removed, and the entire site graded. The applicant has changed that plan, and now intends to minimize grading and cut vegetation rather than remove it.*

The consideration of soil crusts, physical or biotic, was included during the evaluation of potential project fugitive dust impacts and was a major factor in the requirement to use soil binders both during construction and operation (Mitigation Measures AQ-SC3 parts a and b, and AQ-SC7) that will mitigate the loss of dust control from the disturbance of the natural soils crusts. Please also see the response to Greenhouse Gases and Climate Change comments in Section 11.2.

Comment ISEGS-6-16: EPA commends BLM for incorporating fugitive dust control measures to limit particulate matter (PM 10) impacts. We agree with the statement on page 6.1-28 that a solar renewable energy project with a 30 to 40 year life located in an ozone and PM10 nonattainment area, and just upwind of other ozone and PM10 nonattainment areas, should address its contribution to the potentially ongoing nonattainment of the PM 10 and ozone standards. For these reasons, we support the additional mitigation measures to address ozone precursors that are discussed on page.6.1-28. We also were pleased at the inclusion of mitigation measure AQ-SC2 which would require the development of an Air Quality Construction. Mitigation Plan (AQCMP) as well as engine requirements for diesel equipment specified by mitigation measure AQ-SC5.

EPA supports incorporating mitigation strategies to reduce or minimize fugitive dust emissions as well as more stringent emission controls for PM and ozone precursors for construction-related activity. All applicable state and local requirements and the additional and/or revised measures listed below should be included in the SDEIS in order to reduce impacts associated with PM and toxic emissions from construction-related activities:

Recommendations:

Due to the serious nature of the PM10 and 8-hour ozone conditions in the Mojave Desert Air Basin and in neighboring Clark County, EPA recommends that the best available control measures (BACM) for these pollutants be implemented at all times and that the SDEIS and the FEIS incorporate the Construction Emissions Mitigation Plan. These measures should also be incorporated into the ROD. We recommend that all applicable requirements under local rules and the following additional measures be incorporated into a Construction Emissions Mitigation Plan.

Fugitive Dust Source Controls:

- Stabilize open storage piles and disturbed areas by covering and/or applying water or chemical/organic dust palliative where appropriate. This applies to both inactive and active sites, during workdays, weekends, holidays, and windy conditions.
- Install wind fencing, and phase grading operations, where appropriate, and operate water trucks for stabilization of surfaces under windy conditions.
- When hauling material and operating non-earthmoving equipment, prevent spillage, and limit speeds to 15 miles per hour (mph). Limit speed of earthmoving equipment to 10 mph.

Mobile and Stationary Source Controls:

- Reduce use, trips, and unnecessary idling from heavy equipment.
- Maintain and tune engines per manufacturer's specifications to perform at California Air Resources Board (CARB) and/or EPA certification, where applicable, levels and to perform at verified standards applicable to retrofit technologies. Employ periodic, unscheduled inspections to limit unnecessary idling and to ensure that construction equipment is properly maintained, tuned, and modified consistent with established specifications. CARB has a number of mobile source anti-idling requirements. See their website at: http://www.arb.ca.gov/msprogitruck-idlingitruck-idling.htm
- Prohibit any tampering with engines and require continuing adherence to manufacturer's recommendations
- If practicable, lease new, clean equipment meeting the most stringent of applicable Federal or State Standards.
- Utilize EPA-registered particulate traps and other appropriate controls where suitable, to reduce emissions of diesel particulate matter and other pollutants at the construction site.

Administrative controls:

- Identify all commitments to reduce construction emissions and incorporate these reductions into the air quality analysis to reflect additional air quality improvements that would result from adopting specific air quality measures.
- Identify where implementation of mitigation measures is rejected based on economic infeasibility.
- Prepare an inventory of all equipment prior to construction, and identify the suitability of add-on emission controls for each piece of equipment before groundbreaking. (Suitability of control devices is based on: whether there is reduced normal availability of the construction equipment due to increased downtime and/or power output, whether there may be significant damage caused to the construction equipment engine, or whether there may be a significant risk to nearby workers or the public.) Meet CARB diesel fuel requirement for off-road and on-highway (i.e., 15 ppm), and where appropriate use alternative fuels such as natural gas and electric.
- Develop a construction traffic and parking management plan that minimizes traffic interference and maintains traffic flow.
- Identify sensitive receptors in the project area, such as children, elderly, and infirm, and specify the means by which you will minimize impacts to these populations. For example, locate construction equipment and staging zones away from sensitive receptors and fresh air intakes to buildings and air conditioners.

***Response**: Mitigation measures AQ-SC1 through AQ-SC7 and TRANS-1 include specific control measures that are identical to, as stringent as, or more stringent than the BACM identified by USEPA. Technical feasibility and effectiveness rather than cost was the primary factor in the selection of the air quality mitigation measures.*

Comment ISEGS-6-21h: For example, the DEIS acknowledges that the Project, in combination with the present and future projects, would result in cumulative air quality effects, but concludes that the Project would not substantially contribute to the cumulative air quality impacts after implementation of staff's recommended mitigation measures (at p. 6.1-33). The analysis is insufficient, however, in that it did not discuss the cumulative localized contributions to air emissions from concurrent construction or operations of the multiple projects described in the cumulative impacts analysis. The localized cumulative air quality impacts of such a scenario should be considered reasonably foreseeable and the SDEIS should discuss the impacts of multiple construction projects overlapping.

***Response**: Additional information regarding overlap of construction has been added to the text in the revised cumulative impact analysis in Section 5.*

11.2 Greenhouse Gases and Climate Change

Comment ISEGS-15-3: Ivanpah will also avoid more than 13 million tons of CO2 emissions over its 30-year lifecycle, as well as 85 percent of the air emissions from an equally-sized natural gas plant.

Comment ISEGS-19-3: In addition to the economic benefits, the project generates numerous environmental benefits as well. Ivanpah will avoid more than 13 million tons of C02 emissions over its 30-year lifecycle, as well as 85 percent of the air emissions from an equally-sized natural gas plant.

Comment ISEGS-38-3: The Ivanpah project will avoid more than 13 million tons of C02 emissions over its 30 year lifecycle, as well as 85 percent of other air emissions, compared to an equally-sized natural gas plant.

***Response**: Although BLM does not agree with the values presented in these comments it does agree with the general findings regarding the western states' regional air quality and global GHG environmental benefits of the proposed ISEGS project. These environmental benefits have been considered in the selection of the Preferred Alternative in the FEIS, and will be considered in the decision whether or not to issue the ROW grant.*

Comment ISEGS-6-17: EPA commends BLM for including a substantive discussion on greenhouse gases as well as estimates of carbon dioxide emissions from the construction of the proposed Project. We recommend that the SDEIS discuss the potential impacts of climate change on the Project as well as any mitigation measures that could reduce the Project's air emissions.

Recommendation:

- Identify specific mitigation measures needed to 1) protect the Project from the effects of climate change, 2) reduce the Project's adverse air quality effects, and/or 3) promote pollution prevention or environmental stewardship.

***Response**: BLM considers these issues to be adequately covered in the SA/DEIS as follows:*

- *1) The potential effects of climate change in the project area is unknown, and the project design already considers reasonable worst-case weather events, so there is no mitigation required to protect the Project from effects of Climate Change.*
- *2) and 3) The project already has a number of mitigation measures to reduce criteria pollutant emissions from construction and operation, which will also reduce GHG emissions, and no other mitigation measures are needed for this type of renewable energy project that will cause a large net reduction in GHG emissions. Additionally, the BLM or the California Energy Commission will be requiring a number of other mitigation measures, such as HAZ-1 through HAZ-6*

and BIO-1 through BIO-20, to promote non-air quality/GHG related pollution prevention and environmental stewardship.

Comment ISEGS-11-1b: Furthermore, the project will fundamentally alter the functional integrity of the landscape, and reduce the desert landscape's unique ability to sequester atmospheric carbon dioxide (a greenhouse gas) 24-hours per day.

Comment ISEGS-30-13: A more comprehensive study of the carbon impacts of ISEGS would be appropriate for this project, considering its purpose and need statement. This should account for the projected carbon budget required to build component parts, to transport parts to the site, to construct and disassemble the site, and to operate using natural gas during non-solar production conditions. This budget should also account for the release of sequestered carbon into the atmosphere by destruction of desert habitat and soils, the short-term loss of carbon absorption from vegetation on site, and the projected long-term success of revegetation at the site, providing the net loss of carbon absorption associated with that success.

Comment ISEGS-2-32a: The FSA/DEIS discussion of greenhouse gas emissions from the project operations (primarily from gas boilers substituting for solar energy), workers traveling long distances to the site, and construction is unclear and inadequate. The DEIS fails to explain how the calculations were made - particularly as to the key assumptions regarding the use of gas boilers that are the primary source of GHG emissions after construction and during ongoing operations. The GHG calculations for construction are provided but no lifecycle GHG analysis is provided to cover the manufacture and transportation of the project components. The lifecycle analysis may reveal quite high emissions given that the 214,000 heliostats for the proposed project (FSA/DEIS at 1-3 (each mirror would be 7.2 feet high by 10.5 feet wide)), will likely be manufactured in Europe. Therefore, both manufacturing and shipping GHG emissions should have been estimated, and alternatives considered that would avoid the emissions where possible, and mitigation measures should have been considered to minimize and off-set and remaining GHG emissions. The DEIS also failed to mention, no less include, any calculation of the net loss of greenhouse gas sequestration from onsite soils and plants.

The greenhouse gas calculations in the DEIS are incomplete and the BLM has failed to provide clear and accurate information regarding this impact. See generally FSA/DEIS at 6.1-59 (Appendix Air-1 Greenhouse gas emissions). The proposed project will admittedly produce over 27,000 tons of CO2 equivalent per year from operations alone with the primary source being gas boiler use. FSA/DEIS at 6.1 65 (Greenhouse Gas Table 3; 27,444 MTC02E, with 25,458 MTC02E from the gas boiler use). This level of emissions is significant in and of itself as it is more than twice the significance threshold recently adopted by the South Coast Air Quality Management District for greenhouse gas emissions and well above the threshold suggested by EPA of 25,000 tons for regulating CO2 emissions under the proposed Tailoring Rule. Prevention of Significant Deterioration and Title V, Greenhouse Gas Tailoring Rule; Proposed Rule, 74 Fed. Reg. 55292, (October 27, 2009) ("The first phase, which would last 6 years, would establish a

temporary level for the PSD [Prevention of Significant Deterioration] and title V applicability thresholds at 25,000 tons per year (tpy), on a 'carbon dioxide equivalent' (C02e) basis, and a temporary PSD significance level for GHG emissions of between 10,000 and 25,000 tpy C02e.").

Comment ISEGS-1-46: Living soil crusts also store C02 and their removal may contribute to a lack of organic offsets anthropogenic greenhouse gas emissions. It would be a wise idea for BLM to calculate the amount of C02 that the removal of 4,000 acres of soil crust and vegetation would offset.

Comment ISEGS-1-21: Scientific studies have revealed that desert vegetation and biological soil crusts in the ecosystems, as well as soils, 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).

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 living crust? Please provide a detailed analysis on the amount of GHG that would otherwise be offset by an intact arid ecosystem.

Carbon balance is not discussed as a section in the FSA/DEIS, but we want to point out some discrepancies about utility-scale industrial renewable energy as an offset for the burning of carbon. CO2 will be emitted as trucks drive around hours a day, every day, washing mirrors and doing maintenance chores. We question how much greenhouse gases will be cut by the project when this is factored in. Not an idle issue, the same problem was brought up at a workshop for Tessera's Solar 1 Stirling engine solar project near Barstow, California: Tessera agreed to look into using alternative fuel or even electric trucks for washing at the 8,230-acre site to reduce carbon emissions (Transcript of September 16, 2009, Data Request and Issues Resolution Workshop in Barstow.

We would also like to know where each part is going to be made (will the mirrors be built in Europe?), and how much carbon will be released shipping these parts to the project site?

No Sulfur Hexafluoride (SH6) minimization is discussed regarding transmission line upgrades. SH6 is colorless and very powerful greenhouse gas used primarily in electrical transmission and distribution systems and as a dielectric in electronics. The EPA calls SF6 a "High Global Warming Potential gas." From www.epa.gov: "Electrical Transmission and Distribution. The primary user of SF6 is the electric power industry. Because of its inertness and dielectric (nonconductive) properties, SF6 is the industry's preferred gas for electrical insulation, current interruption, and arc quenching in the transmission and distribution of electricity. SF6 is used extensively in circuit breakers, gas insulated substations, and switchgear. The U.S. inventory report provides detailed descriptions on SF6 emissions from electrical transmission and distribution and how

they are estimated (see the Chapter entitled "Industrial Processes"). EPA has also established a voluntary program, called the SF6 Emissions Reduction Partnership for Electric Power Systems, which works with the electric power industry to reduce SF6 emissions."

SF6 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/electricpowersf6/basic.html).

Please provide a detailed analysis of the amount of SF6 gases that would be released by this project.

Comment ISEGS-2-31: Federal courts have squarely held that NEPA requires federal agencies to analyze climate change impacts. Center for Biological Diversity v. National Highway Traffic Safety Administration, 508 F.3d 508 (9th Cir. 2007). As most relevant here, NEPA requires consideration of greenhouse gas emissions(" GHG emissions") associated with all projects and, in order to fulfill this requirement the agencies should look at all aspects of the project which may create greenhouse gas emissions including operations, construction, and life-cycle emissions from materials. Where a proposed project will have significant GHG emissions, the agency should identify alternatives and/or mitigation measures that will lessen such effects.

As part of the NEPA analysis federal agencies must assess and, wherever possible, quantify or estimate GHG emissions by type and source by analyzing the direct operational impacts of proposed actions. Assessment of direct emissions of GHG from on-site combustion sources is relatively straightforward. For many projects, as with the proposed project, energy consumption will be the major source of GHGs. The indirect effects of a project may be more far-reaching and will require careful analysis. Within this category, for example, the BLM should evaluate, GHG and GHG-precursor emissions associated with construction, electricity use, fossil fuel use, water consumption, waste disposal, transportation, the manufacture of building materials (lifecycle analysis), and land conversion. Moreover, because many project may undermine or destroy the value of carbon sinks, including desert soils, projects may have additional indirect effects from reduction in carbon sequestration, therefore both the direct and quantifiable GHG emissions as well as the GHG effects of destruction of carbon sinks should be analyzed.

Comment ISEGS-11-2b: Renewable energy projects, including the proposed ISEGS project, are elements of a national climate change mitigation strategy to reduce greenhouse gas emissions. Several California state, national, and international climate

change reports describing climate change adaptation strategies underline the importance of protecting intact wild lands and associated wildlife corridors as a priority adaptation strategy measure.

The FSA/DEIS fails to identify and analyze the loss of carbon sequestration that will occur under the proposed project. Desert vegetation types are able to sequester atmospheric carbon dioxide (greenhouse gas) 24 hours/day, unlike other vegetation communities that are able to sequester CO2 only during daylight hours. Not only will the project, as located, adversely affect a number of rare species it will also adversely impact the diverse photosynthetic productivity of the region. The rich species composition of the site is unique in that all known photosynthetic pathways are represented. The photosynthetic activities of cool weather C3 plants, the warm weather C4 plants, and the nocturnal CAM (crassulacean acid metabolism) plants are significant. The loss of the density and diversity of cactus species would contribute to the carbon dioxide imbalance that green energy is purported to fix. CAM photosynthesis is found in cactus and succulent plants and is the most efficient photosynthetic process for fixing carbon dioxide of the three represented pathways present on site. This issue demands that a location that has already been disturbed should be the primary choice for energy development. Since this is one of many energy projects anticipated within Ivanpah Valley, and indeed throughout the CDCA, it needs to set a rational precedence and needs to be adequately analyzed in the cumulative effects section of the environmental document.

***Response**: The discussion of greenhouse gases and global warming in the DEIS has been revised to include the following:*

- *An analysis of natural CO_2 uptake loss due to the project.*
- *An analysis of the energy payback time for thermal solar projects.*

Please note that the secondary CO_2 uptake effects of the project are extremely minor in nature and are overwhelmed by the reduction in CO_2 that that project's near zero CO_2 energy provides. Additionally, the energy payback time for thermal solar projects is on the order of a few months, which clearly demonstrates that the project will cause a reduction in CO_2 emissions.

BLM disagrees with comments that the project's GHG emissions are significant. This is a renewable energy project, that is defined by its very nature as a project that reduces GHG emissions. Increasing renewable energy is one of the major policy goals toward the reduction of GHG emissions, both within the State of California and nationwide. Additionally, the PSD tailoring rule was recently adopted and the thresholds were increased to 100,000 tons for new projects, this project's operating emissions would be well under the PSD tailoring rule threshold and would not be subject to PSD permitting for GHG emissions.

An emission estimate of all direct GHG emission sources, including truck and employee travel and SF6 was included in the GHG analysis as shown in Tables 5.2-1, 5.2-2, and

5.2-7. The CO2e emissions of SF6 and operating vehicle use were found to be minor in comparison with the other project operating emission sources, and are negligible in comparison with the indirect emission reductions from this renewable energy project.

The construction and operation emission GHG emission estimates were determined through information available in the AFC and data responses, as cited in the SA/DEIS table sources, and further correspondence with the applicant. As noted the GHG emission estimates were based on the latest California Air Resources Board emission factors. The AFC, data responses, and additional applicant correspondence can be found on the California Energy Commission's website for the project:

http://www.energy.ca.gov/sitingcases/ivanpah/documents/index.html

Comment ISEGS-2-33b: BLM assumes that these significant GHG emissions will be mitigated by actions totally beyond its control, such as market-driven processes that will require that whatever renewable power is ultimately generated from the project actually displaces fossil fuel use. See FSA/DEIS at 6.1-59 to 6.1-60. This is not allowed under NEPA, and the BLM must analyze the impacts of the project before it and cannot minimize the analysis based on other factors and future offsets or mitigation that is dependent on conditions outside of its control. See, e.g. Neighbors of Cuddy Mountain v. US. Forest Service, 137 F.3d 1372, 1380-81 (9th Cir. 1998). The Forest Service's broad generalizations and vague references to mitigation measures do not constitute the detail as to mitigation measures that would be undertaken, and their effectiveness, that the Forest Service is required to provide. Moreover, even if the mitigation (e.g. displacement of fossil fuels) turns out to be effective, it does nothing to actually prevent the CO2 emissions resulting from the proposed project or the loss of carbon sequestration from soils. Moreover, it is undisputed that in the near-term GHG emissions will increase emissions during construction, manufacturing and transportation of the components, and during the initial phases of the project when the gas boilers may be used without any limitation. BLM fails to consider any alternatives to the project that would minimize such emissions or to require that these near-term emissions be off set in any way.

Although the proposed project's technology which requires significant use of natural gas is admittedly experimental and will cause significant GHG emissions, BLM completely fails to explore this aspect of the impacts of the project in the DEIS in violation of NEPA.

Comment ISEGS-2-32b: Despite the significant level of emissions from operations facts, the BLM does not provide any minimization measures or other alternatives measures that would reduce the operations GHG emissions (during the initial start up of the plant or in the long-term), analyze any alternative technologies in terms of their GHG emissions (e.g., PV solar has no ongoing operational GHG emissions), provide any minimization measures for the GHG emissions, or consider any off-sets for these emissions.

***Response**: These comments are factually incorrect and appear to show a misunderstanding regarding the significant differences in magnitude between the direct project and indirect GHG emissions increases associated with the project and the indirect project emission reductions from energy displacement. The assumption of renewable energy and its displacement of fossil fuel fired energy and related beneficial impact for GHG emissions is based on verifiable science. The GHG section in large part is based on information provided by the California Energy Commission's Electricity Analysis Office, which has modeled the effects of renewable energy including its verifiable GHG emission reduction impacts. The direct emissions from construction and indirect emission from the loss of carbon sequestration are minor in comparison with the reduction in fossil-fuel based GHG emissions that will occur due to this renewable energy project[1]. GHG is not a short-term problem it is a global long-term problem and this renewable energy project would cause long-term GHG emission reductions.*

Comment ISEGS-2-32c: Moreover, the DEIS is extremely unclear regarding the calculations used to obtain the GHG emissions rates and what the actual proposed limits will be on gas boiler use that would maintain this level of emissions. While the DEIS repeatedly states that the boilers would be used for up to 4 hours a day with an average of no more than one hour a day (see, e.g., FSA/DEIS at 3-8, 3-9, 6.1-64, 7.2-4), during the evidentiary hearing before the CEC it was made clear that the calculations of GHG emissions were in fact not based on 365 hours per year but rather on 480,000 mmBtus per year which figure was provided by the applicant and apparently represents a calculation of using the gas boilers for up to 5% of the energy output which could translate to approximately 520 hours per year. Clearly the figure used was higher than the 1 hour per day average discussed in the DEIS Indeed, the 5% condition is proposed by the CEC but the Air District permit would allow for up to 4 hours per day use or up to 1460 hours per year; no calculation of GHG emissions was provided for that amount of use. Moreover, the DEIS also ambiguously states: "The proposed project would be permitted, on an annual basis, to emit over 27,000 metric tons of C02-equivalent per year if operated at its maximum permitted level." Thus, it is unclear from the statements in the DEIS if the "maximum permitted level" is the 5% CEC limit or the 4 hour per day Air District Limit. Although the question of the proposed amount of gas boiler use and the basis for the GHG emissions calculations seems to have been resolved during the CEC hearings, the correct unambiguous information was not provided to the public by the BLM in the DEIS. On this basis as well as others the DEIS is inaccurate and misleading and must be revised and re-circulated for full and fair public review.

There is no calculation of emissions provided during the start up phase of 180 days during which the CEC would allow unlimited use of the gas boilers. Moreover, it is entirely unclear whether or how the BLM will monitor and/or enforce the limit on the use

[1] These reductions could vary from approximately 1.0 MTCO2e/MWh for displacing coal power plant generation to 0.35 MTCO2e/MWh, which means an indirect reduction of anywhere between approximately 300,000 MTCO2e and 880,000 MTCO2e, which is well over an order of magnitude more than the project's direct annual operating GHG emission rate.

of the gas boilers and hence ensure the limit of GHG emissions is as stated in the DEIS or whether it will rely solely on the CEC to perform that function.

The GHG emissions from the construction phase of the project are stated to be 17,779 metric tons C02 equivalent (Greenhouse gas table 2, FSNDEIS at 6.1-64).

***Response**: The boiler's most stringent operational limit would be established in CEC Condition of Certification AQ-SC10, which would limit the boiler's operation to no more five percent of the total annual heat input for the facility. This limit was used to determine the maximum GHG emissions from the boilers. The California Energy Commission has jurisdictional authority for this power facility and will be responsible for enforcement of AQ-SC10.*

Initial commissioning is not exempt from the requirements of AQ-SC10, so emissions during initial commission of the boilers or other equipment are not expected to be any higher than those of other years.

Please also see the responses above for a discussion on the significance of the project's GHG emissions

12 BIOLOGICAL RESOURCES

12.1 Biological Resources - General

Biological Resources - General

Comment ISEGS-7-22: The Ivanpah SEGS project will impact over 4,000 acres of desert tortoise habitat and likely displace over 50 individual tortoises. The project will destroy several rare plant communities, a number of which have a significant portion of their range in the Northern Ivanpah Valley. Finally, many other species may be impacted, including migratory birds and reptiles. Defenders urges BLM to seek avoidance measures, adequate mitigation measures if necessary, and a robust alternatives analysis. A strong EIR will only help this project going forward, as well as the many projects that will follow.

Comment ISEGS-6-19a: Proposed designs for the Project should avoid and minimize impacts to all federally threatened and endangered species, as well as BLM species of concern and State species of concern. In addition to desert tortoise, the site of the proposed Project includes sensitive species such as bighorn sheep, the American badger, and the golden eagle, among others. Any mitigation measures that result from consultation with the US Fish and Wildlife Service to protect sensitive biological resources should be included in the FEIS and, ultimately, the ROD. While the DEIS describes mitigation measures for potential impacts to sensitive species, it does not provide a clear commitment to implement these measures. The FEIS should also clearly articulate under which alternatives sensitive biological resources, including the desert

tortoise, bighorn sheep and American badger, would be least impacted and to what extent impacts can be mitigated.

Comment ISEGS-21-2: Moreover, the FSA determines that unmitigable damage will be done to rare plant assemblages and species by this project. If the staff determines that something as important as biological resources cannot be mitigated, then the project should not be allowed to proceed. Additionally, important habitat for the burrowing owl, golden eagle, loggerhead shrike, and badgers will be lost due to this project. All of the biological resources threatened by this project are a signal that it should not proceed.

Comment ISEGS-2-11b: As discussed below, because of the deficiencies of the baseline data for the proposed project area, the DEIS fails to adequately describe the environmental baseline. Many of the rare and common but essential species and habitats have incomplete and/or vague on-site descriptions that make determining the proposed project's impacts difficult at best. Some of the rare species habitats baseline conditions are totally absent, therefore no impact assessment is provided either. A supplemental document is required to fully identify the baseline conditions of the site, and that baseline needs to be used to evaluate the impacts of the proposed project.

Comment ISEGS-9-9: Biological Resources, Page 6.2-1 - Paragraphs 2 and 3 on this page state that "[the Ivanpah Solar Electric Generating System (ISEGS) project would have major impacts to the biological resources of the Ivanpah Valley, substantially affecting many sensitive plant and wildlife species and eliminating a broad expanse of relatively undisturbed Mojave Desert habitat. Approximately 4,073 acres of occupied desert tortoise habitat would be permanently lost and a minimum of 25 desert tortoises would need to be translocated west of the ISEGS project site." "Other special-status wildlife species potentially impacted by the project because of loss of breeding and/or foraging habitat include burrowing owl, loggerhead shrike, Crissal thrasher, golden eagle, and American badger. The project would also affect approximately 2,000 ephemeral drainage segments on the ISEGS site, potentially resulting in direct or indirect impacts to the wildlife functions and values provided by 198 acres of waters of the state . "

Comment ISEGS-8-12: The NEMO Plan set the goal for special status species as "Populations and their habitats are sufficiently distributed to prevent the need for listing" (NEMO Plan at 2-6). The FSA/DEIS fails to fully analyze impacts to gila monsters, burrowing owl, other bird species, bats, and other wildlife or to provide alternatives to avoid impacts, or provide measures to minimize impacts. In doing so, it fails to meet NEPA's requirements or satisfy the NEMO Plan's objectives.

Comment ISEGS-7-2: In addition, the FSA/DEIS does not adequately address the significant loss of habitat and cumulatively significant impacts associated with a project that spans more than 4,000 acres of high quality, relatively undisturbed desert land.

Comment ISEGS-30-6a: Thermal plumes have the potential to pose risks for birds, bats, and insects, and these impacts need to be fully analyzed.

***Response**: These comments are general in nature. Each item in these comments is also the subject of specific comments, which are summarized and responded to in the following subsections.*

12.2 Biological Resources - Tortoises

Tortoise - General

Comment ISEGS-2-38: As discussed above, BLM's failure to adequately address impacts to the desert tortoise in the DEIS fails to comply with NEPA. In addition, the biological assessment and draft translocation plan provided to the Fish and Wildlife Service are grossly inadequate.

Comment ISEGS-6-18: Up to 4,073 acres of desert tortoise habitat could be permanently impacted by the proposed Project. Long-term impacts may occur as a result of permanent loss of habitat, increased predation, and habitat fragmentation. The DEIS states that a Biological Assessment has been prepared that analyzes the potential impacts, and the U.S. Fish and Wildlife Service (USFWS) is preparing a Biological Opinion (pg. 2-18). Additionally, the DEIS indicates that BLM continues to engage with the California Department of Fish and Game (CDFG), USFWS, the California Energy Commission (CEC), and the Applicant to finalize details of a compensatory mitigation proposal.

Recommendations:

- EPA recommends BLM include the outcome of its consultation with the U.S. Fish and Wildlife Service and the Biological Opinion, if completed, in the SDEIS. Provide analysis of impacts on, and mitigation for, covered species, including:
  - Baseline conditions of habitats and populations of the covered species;
  - A clear description of how avoidance, mitigation and conservation measures will protect and encourage the recovery of the covered species and their habitats in the project area;
  - Monitoring, reporting and adaptive management efforts to ensure species and habitat conservation effectiveness.
- Incorporate complete information on the compensatory mitigation proposals (including quantification of acreages, estimates of species protected, costs to acquire compensatory lands, etc.) and analyze the environmental and economic trade-offs of acquiring the off-site lands versus reducing the size of on-site alternatives for equivalent protection.
- Include discussion of CDFG's ultimate compensation ratio recommendation for this Project and how their recommendation compares economically and environmentally to CEC's and BLM's proposed ratios.

Comment ISEGS-7-12: The proponent has characterized the site as disturbed land with little to no value for wildlife. Defenders recognizes that this project site has been in the Clark Mountain grazing allotment (CA- 690-EA06 26). However, the grazing activity on the site has been nominal. Defenders staff has visited the site and we concur with the assessment in the FSA/DEIS (p. 6.2-29) that "the ISEGS project area provides high quality habitat for this species, with low levels of disturbance and high plant species diversity." The desert tortoise population in the Northern Ivanpah Valley is also unique because it is the highest elevation at which this species is known to reside in the State (FSA, page 6.2-29). Therefore, the area could be very important for desert tortoise survival if the species is forced to seek out higher elevation habitat as a result of climate change and aridification of the Mojave Desert.

Comment ISEGS-8-18a: The NEPA requires the BLM to include appropriate mitigation measures in its environmental analysis. The management guidelines for Category III desert tortoise habitat are to "Limit tortoise habitat and population declines to the extent possible by mitigating impacts" (Spang et al. 1988). The NEMO Plan does not cover projects greater than 100 acres (NEMO Plan at 2.27). The BLM must thus describe in its NEPA document the impacts of the proposed action, explain the specific measures that will mitigate these impacts, and analyze how these measures would reduce impacts to less than significant and thus avoid compromising the NEMO Plan's conservation strategy.

Comment ISEGS-8-10: In summary, the direct, indirect, and cumulatively impacts of the proposed project on the threatened desert tortoise will be severe. Since the Northeastern Mojave population is the most genetically distinct desert tortoise population in California, and the North Ivanpah Valley desert tortoises exhibit behavioral adaptations that may be important for the long-term survival of the species, protection of these tortoises may well be critical to the conservation of the entire listed population in California. We are extremely concerned that the impacts of the proposed project will endanger California's Northeastern Mojave desert tortoise population, and will place the entire Mojave desert tortoise population at risk.

Comment ISEGS-6-19b:

- A clear commitment to implement mitigation measures to avoid and minimize adverse effects to the habitat of the desert tortoise and other sensitive species should be made in the SDEIS and, ultimately, the ROD.
- Mitigation measures that result from consultation with the US Fish and Wildlife Service to protect sensitive

Comment ISEGS-39-2: The construction of ISEGS as proposed by BrightSource Energy will directly contribute to the continued decline of the Mojave Desert Tortoise because 4,073 acres of occupied, high-quality desert tortoise habitat will be permanently lost and because adjacent habitat will be degraded and fragmented.

The ISEGS vicinity is Bureau of Land Management (BLM)-designated Category I Desert Tortoise Habitat, per the "*California Statewide Desert Tortoise Management Policy*" and is more recently recognized at Category I Desert Tortoise Habitat in the BLM's Northern and Eastern Mojave (NEMO) Plan Amendment to the California Desert Conservation Area Plan. While the ISEGS site is not within a Desert Wildlife Management Area (DWMA), the *Desert Tortoise Recovery Plan* identifies habitat outside DWMAs like the ISEGS area as providing corridors for genetic exchange and dispersal of desert tortoises among DWMAs. As early as the Preliminary Staff Assessment for ISEGS, California Energy Commission staff recognized that the non-lakebed portion of the Ivanpah Valley is excellent desert tortoise habitat and that the "...ISEGS project area provides high quality habitat for this species, with low levels of disturbance and high plant species diversity" (2008, 5.2-30).

Comment ISEGS-39-4: The importance of the tortoise population at Ivanpah must not be under valued. The annual replacement rate within stable populations of the desert tortoise is estimated to be only about two percent; therefore, adult tortoises must be protected to ensure optimal recruitment of new individuals into the population. This is essential in the northern Ivanpah Valley as the tortoises there are part of the NEMO Desert Tortoise Recovery Unit and this population is declining. The most recent *Range-Wide Monitoring Report* (2009) shows that current densities of tortoise within NEMO – at an average 1.7 animals per square mile – are the lowest among the six Recovery Units recognized in the *Recovery Plan.* It is not surprising, then, that Kevin Hunting of the Department of Fish and Game writes in his letter of October 27, 2009 to the California Energy Commission:

> The Department believes this known population of desert tortoise in its natural habitat within the northern portion of Ivanpah Valley, but outside a DWMA, may be valuable to the recovery of the species for the same reasons stressed in the Recovery Plan.

***Response**: The EIS has acknowledged the project's impact to desert tortoises and their habitat, and has developed Mitigation Measures to minimize and compensate for the impacts.*

Tortoise – Issues Regarding Protection Classification

Comment ISEGS-12-2: Given that the Northeastern Recovery Unit is a distinct and evolutionary significant population of the threatened Mojave desert tortoise, the BLM is legally obligated, as Chapter 3 of the CDCA Plan asserts, to "avoid sensitive resources" in granting any ROW.

The importance of avoiding impacts to the Northeastern Desert Tortoise Recovery Unit is underscored by our conviction that the cumulative impacts of ISEGS and the other energy projects proposed for the

vicinity could result in the loss of the Northeastern Mojave Desert Tortoise Recovery Unit as a viable population in the northern Ivanpah Valley.... Direct, indirect and cumulative impacts of the proposed ISEGS project on the desert tortoise include destruction and loss of high quality habitat, take of the population, population fragmentation, and compromised viability.

Comment ISEGS-2-27: The value of the habitat in the Northern Ivanpah Valley to the desert tortoise and its long term conservation and recovery is, unfortunately, not the same as BLM's preferred management strategy. The Desert Tortoise Recovery Plan identified this area as conservation habitat (see map at 41) and the Northern Ivanpah Valley Desert Tortoise Management Unit was classified as Category I in the CDCA plan and in the BLM's Desert Tortoise Habitat Management on Public Lands. In adopting the NEMO Plan in 2002, the BLM excluded the Category I habitat in the Northern Ivanpah Valley from designation in a DWMA for management reasons having nothing to do with the quality of the habitat. According to the NEMO Plan:...

NEMO Plan FEIS, Appendix A, at A-4 (Note: "north" appears to be mistake as most of the area in questions is actually south of Prirnm). The BLM ignored the fact that although this population of tortoises is somewhat separated from those below 1-15, it is not separated from the tortoise populations to the northeast within Nevada. In fact, connectivity has been maintained under 1-1 5 through undercrossings and could be improved. Moreover, BLM ignored the fact that the tortoises in this area are part of a very small population of tortoises from the Northeastern Mojave Recovery Unit found in California.

Despite the scientific evidence based on genetics, morphology and behavior that the tortoise in this area are part of the Northeastern Mojave Recovery unit, BLM in the NEMO Plan listed only recovery of the tortoise in the Eastern Mojave Recovery Unit as a goal of the Plan, at 1-3, and stated:...

NEMO Plan FEIS at 1-3, n. 6. However, the Recovery Unit boundaries are not based on adjacency but reflect distinct population segments of the desert tortoise that were determined based on "substantial geographic variation in genetic, morphological, ecological, physiological and behavioral traits." Recovery Plan at 19. These distinctions have been confirmed through genetic evidence as well.

As a result of BLM's focus on management factors rather than tortoise recovery, after the adoption of the NEMO Plan the Northern Ivanpah Valley Unit area was reclassified the desert tortoise habitat "Category III" based on management considerations, not the quality of the habitat.

Comment ISEGS-8-3: The FSA/DEIS fails to provide crucial baseline information such as the amount of habitat in the Northeastern Mojave Recovery Unit in California, and fails to adequately document impacts to this resource. Without an adequate description of the ESU, a full analysis of the impacts of the proposed project is impossible, nor is a

meaningful comparison of alternatives or the development of adequate mitigation measures possible.

Comment ISEGS-7-11: The proposed project site is classified by BLM as Category III desert tortoise habitat, which is the least protective category. The 1994 Desert Tortoise Recovery Plan included the North Ivanpah Valley in the proposed Ivanpah Desert Wildlife Management Area ("DWMA"), recognizing the ecological value of the area and its importance to desert tortoise recovery. Unfortunately, BLM chose to exclude the North Ivanpah Valley from the DWMA in the Northern and Eastern Mojave ("NEMO") Planning Area amendments to the California Desert Conservation Area ("CDCA") Plan. The importance of this area is evidenced by the number of tortoises that continue to occupy this site. Surveys completed by the project proponent's consultants found at least 26 desert tortoises on this site. BLM should expect to find approximately double that number - 52 tortoises - currently occupying the site. The estimated population of desert tortoises occupying the project area is approximately twice the observed number due to variable factors of detectability and above-ground activity. This Northern Ivanpah Valley tortoise population is very significant, particularly because the population there has crashed from a one-time maximum density of 50 tortoises per square mile (Desert Tortoise Recovery Plan, page F13). As discussed above, the proponent's survey results show that approximately 52 tortoises likely occupy the 6-7 square-mile site (7-8 tortoises per square mile). This is significantly less than the onetime maximum density referenced above.

Comment ISEGS-1-36b: Protection Status: Unless the No Action alternative is taken and cumulative degradation and fragmentation of habitat is avoided, we are concerned that the desert tortoise this northeastern Evolutionarily Significant Unit will be upgraded from Federally Threatened to Federally Endangered.

Comment ISEGS-2-11c: The DEIS also uses the land use designation as a way of minimizing the importance of this area for tortoise recovery but fails to explain the history of the current designation. Prior to the desert tortoise being listed as a threatened species, the BLM recognized the habitat in the project site as "Category 1" habitat, indicating it was the highest quality for desert tortoise. The on-the ground habitat has not changed for the desert tortoise on the project site, substantiated by the relative density of the animals on the project site. Post listing in 1994, the Fish and Wildlife Service published a Recovery Plan for this threatened species that identified the Desert Wildlife Management Areas ("DWMA") that needed to be established as desert tortoise reserves and should be protected from known threats. The BLM codified a majority of the DWMA areas in the Northern and Eastern Recovery Unit in California through the establishment of DWMA's in the Northern and Eastern California Plan ("NEMO). However, the agency failed to include the recommendations of the Desert Tortoise Recovery Plan for the Ivanpah DWMA, which included the northern Ivanpah Valley north of the Interstate 15. The proposed project is within the boundaries of this critical recovery area for the desert tortoise that, unfortunately, the BLM has to date failed to adequately protect.

Comment ISEGS-8-18b: In the FSA/DEIS, BLM proposes mitigating impacts at the power plant site by acquiring habitat and implementing recovery actions in the Eastern Mojave Desert Tortoise Recovery Unit (FSA/DEIS at 1-19).

This is populated by a different desert tortoise ESU. This will not mitigate impacts to the affected Northeastern Mojave ESU. Because the DEIS has failed to address direct, indirect and cumulative impacts to the Northeastern Mojave desert tortoise population and the significance of this ESU to the conservation of the entire listed population, and because the DEIS fails to present specific mitigation measures it is impossible to determine the adequacy of the mitigation. The primary mitigation mechanism for any large scale project that will permanently destroy and disturb large tracts of desert tortoise habitat must be acquisition of replacement habitat. The location of this replacement habitat is not identified in the FSA/DEIS. However, it is doubtful if sufficient replacement habitat exists within the Northeastern ESU in California to offset habitat loss on this scale.

Comment ISEGS-5-12: The DEIS omitted any discussion the 1994 Final and 2008 Draft recovery goals. NEPA requires that the agency disclose to the public the underlying environmental data from which . . . [an] expert derived her opinion." Ecology Center v. Austin 430 F.3d 1057, 1067-68 (9th Cir. 2005). Here, BLM was required to show, based on facts and evidence, that any federal approvals for the ISEGS Project was consistent with the 1994 Recovery Plan.

The 1994 and 2008 Plan recommend that land managers focus recovery efforts toward tortoise conservation areas; however, the Plans also emphasize that land managers should try to limit the loss of habitat outside conservation areas as much as possible. Id. The Recovery Plans emphasize that activities occurring outside the boundaries of existing tortoise conservation areas can negatively affect tortoise populations. Draft Recovery Plan.

In addition, the DEIS acknowledged that the direct impacts to the tortoise would be immense:...

As discussed below, the mitigation measures set forth in the DEIS are insufficient. As such, these direct impacts would severely impact the desert tortoise, in contravention of the goals of the Endangered Species Act, the Recovery Plans and NEPA. Thus, the DEIS is inadequate.

Comment ISEGS-8-4: In California, the Northeastern Mojave desert tortoises are restricted to the Ivanpah Valley with the boundaries marked by the Clark, Ivanpah, and New York Mountains. The California Natural Diversity Database (CNDDB) estimates the size of the desert tortoise habitat within the Recovery Unit in California at 184,519.6 acres (CNDDB 2009). The CNDDB polygon excludes most of the Ivanpah Dry Lake bed but includes Interstate 15, Nipton Road, Ivanpah Road, Nipton, Ivanpah, the railroad, the Primm golf course, some mountainous terrain and other unsuitable habitat (see CNDDB 2009b for a map showing the polygon). It thus considerably overestimates the

amount of Northeastern Mojave desert tortoise habitat in California. Based on the CNDDB polygon the North Ivanpah Valley accounts for about 24% or almost a quarter of all desert tortoise habitat in the Northeastern Mojave Recovery Unit in California.

In 1988, the BLM began categorizing desert tortoise habitat under its range wide plan for desert tortoise habitat management (Spang et al, 1988). The North Ivanpah area was categorized as category I habitat and was managed as such until the signing of the ROD for the NEMO Plan Amendment in December 2002. The Desert Tortoise (Mojave Population) Recovery Plan included the North Ivanpah Valley within the proposed Ivanpah DWMA (USFWS 1994 at 41). The 1994 Recovery Plan included the North Ivanpah Valley in its proposed Ivanpah DWMA (see USFWS 1994 Figure 9). The NEMO Plan's Desert Tortoise Biological Team recommended consideration of the North Ivanpah Unit by the BLM for desert tortoise conservation in the NEMO Planning Area (NEMO Plan at A3). The 2002 EIS for the NEMO Plan recognized the value of the North Ivanpah Valley for desert tortoise and considered an alternative that included designating the North Ivanpah Unit as an Area of Critical Environmental Concern (ACEC) and part of the Ivanpah DWMA. However, the NEMO Plan's preferred and adopted alternative focused desert tortoise recovery on the Eastern Mojave Recovery Unit to the detriment of the Northeastern Mojave Recovery Unit in California and the North Ivanpah Valley was not included in the Ivanpah DWMA. Under the NEMO Plan, all desert tortoise habitat outside DWMAs was reclassified as Category III. The designation Category III does not mean that the habitat is degraded, contains low tortoise densities, or is unimportant it simply means it is not currently within a designated DWMA. The BLM manages all categorized desert tortoise habitat to protect desert tortoise with the management goal for Category III habitat being to limit tortoise habitat and population declines. The change in designation had no effect on the habitat per se. It remains good quality desert tortoise habitat. The basis for this change in designation was the BLM's focus on the Eastern Mojave ESU – "The preferred alternative is to propose that USFWS modify recovery unit boundaries so that all of NEMO is part of the Eastern Mojave Recovery Unit. Currently a portion of the planning area is in the Northern and Eastern Mojave Recovery Unit, but it forms a cohesive unit with the rest of the Eastern Mojave Desert tortoise habitat. Strategies for the Northern and Eastern Mojave Recovery Unit are focused firstly in areas northeast of Las Vegas, and secondarily, in an area north of Nipton Road in an area of Nevada that is not adjacent to the state line." NEMO Plan at 1-3.

Comment ISEGS-2-11d: The DEIS fails to provide adequate baseline information and description of the environmental setting in many areas including the status of the desert tortoise and other sensitive and rare plant and animal communities and even the most basic information regarding the climate of this area.

The desert tortoise is protected under the federal Endangered Species Act (55 Fed. Reg. 12178 (1990)) and the California Endangered Species Act (August 3, 1989), is the California State reptile, and is sorely in need of additional protections to stem population declines due to ongoing threats. These issues should have been fully explored in the baseline discussion. Although the DEIS admits that the "area provides high quality

habitat for this species, with low levels of disturbance and high plant species diversity (CDFG 2008a). The desert tortoise population in this part of the Ivanpah Valley is also unique because it is the highest elevation at which this species is known to reside in the state (CDFG 2008)." The DEIS briefly mentions the current status of the species but does not clarify the need for additional protective measures to ensure recovery.

Comment ISEGS-8-5: Tortoises in the Ivanpah Valley differ from other desert tortoise populations in California (Lamb, 1986; Lamb et al., 1989; Murphy et al., 2007). Northeastern Mojave desert tortoises exhibit the greatest genetic differentiation of the five recognized units occurring in California (Murphy et al., 2007). According to the DEIS, the desert tortoise population in the North Ivanpah Valley is also unique because it is the highest elevation at which this species is known to reside in the state (PSA/DEIS at 6.2-29).

The limited range, overall importance to genetic diversity, and behavioral adaptations underlie the need to conserve this desert tortoise population in California. This is especially important given the threats posed by global climate change. As the USFWS 2008 Draft Revised Recovery Plan notes, "Climatic regimes are believed to influence the distribution of plants and animals through species-specific physiological thresholds of temperature and precipitation tolerance. Warming temperatures and altered precipitation patterns may result in distributions shifting northward and/or to higher elevations, depending on resource availability (Walther et al. 2002). We may expect this response in the desert tortoise to reduce the viability of lands currently identified as "refuges" or critical habitat for the species." (USFWS 2008 at 133).

The 2002 EIS for the NEMO Plan recognized the value of the North Ivanpah Valley for desert tortoise. It considered an alternative (Alternative 2 "Desert Tortoise Recovery") that included designating the North Ivanpah Unit as an Area of Critical Environmental Concern (ACEC) and part of the Ivanpah DWMA. However, the NEMO Plan's preferred and adopted alternative focused on the Eastern Mojave Recovery Unit. Thus the FSA/DEIS cannot simply defer to the NEMO Plan's analysis since that plan did not address conservation of the Northeastern Mojave desert tortoise ESU nor did it address California State interests in these tortoises.

The 1984 status report tortoise density map of the Ivanpah Valley indicates that tortoise densities in the North Ivanpah Valley ranged from 20-100/sq mile with about half of the habitat (including the area of the power plant footprint) in the range of 50-100/sq mile (Berry et al., 1984 Plate 6-13). The most recent range wide monitoring survey report shows that tortoise densities within the Northeastern Mojave Recovery Unit are the lowest of the six recognized Recovery Units, with an estimated density of 1.7 tortoises/square km or 4.4 tortoises/square mile based on surveys conducted in 2007 (USFWS 2009). However, that estimate does not include the Ivanpah Valley which historically had some of the highest tortoise densities in the Northeastern Mojave Recovery Unit. The USFWS currently includes the Ivanpah Valley within its Ivanpah monitoring stratum; the majority of the stratum is located west of the Ivanpah Mountains in the Eastern Mojave Recovery Unit (see Figure 7 in USFWS 2009). For the 2007

survey, only one of the sixteen transects was within the Ivanpah Valley. Both factors make using the Ivanpah monitoring stratum data problematic for estimating tortoise densities in the Ivanpah Valley. There is a permanent study plot located in the southern end of the valley in an area that was identified as having a high tortoise density in the 1984 status report (Berry et al., 1984 Plate 6-13). The study plot population declined between 1986 and 2002. More recent density estimates are not yet available.

Comment ISEGS-2-13a: The desert tortoise has lived in the western deserts for tens of thousands of years. In the 1970's their populations were noted to decline. Subsequently, as mentioned above, the species was listed as threatened by the State of California in 1989 and by the U.S. Fish and Wildlife Service in 1990, which then issued a Recovery Plan for the tortoise in 1994. The U.S. Fish and Wildlife Service is in the process of updating the Recovery Plan, and a Draft Updated Recovery Plan was issued in 2008, however it has not been finalized. Current data indicate a continued decline across the range of the listed species despite its protected status and recovery actions.

The original and draft Updated Recovery Plans both recognize the uniqueness of the northern Ivanpah Valley population in California. This particular subpopulation of tortoise are part of the Northeastern Recovery unit. While the Northeastern Recovery Unit is located primarily in Nevada, a small but significant part of the Recovery Unit dips down into California in the Ivanpah valley. The Recovery Plan recognizes that the Northeastern Recovery Unit has "three mtDNA haplotypes are found in this recovery unit, but they exhibit low allozyme variability with relatively little local differentiation" indicating that the tortoises within this Recovery Unit are genetically distinct from other Recovery Unit populations. Recent population genetics studies have further confirmed that the desert tortoise population in the Ivanpah Valley on and adjacent to the project site are distinctly genetically different from tortoises elsewhere within the Northeastern Recovery Unit, and very genetically different from tortoises in other adjacent Recovery Units. This finding adds weight to the idea that a conservative approach needs to be applied to management of the desert tortoise in the Ivanpah Valley. While the population of the Northeastern Recovery Unit may be widespread through four states, the part of the population within the boundaries of the California Desert Conservation Area where this project is located is very limited and genetically unique. Yet, the DEIS fails to identify and consider the localized impact to this genetically rare portion of the population on the project site.

***Response**: BLM has reviewed the comments, and the associated text in the DEIS and SDEIS. In the FEIS discussion of the affected environment, a more detailed description of the tortoise protection status of this particular property has been added. However, this discussion does not change the conclusion regarding acceptable land uses, mitigation measures, and compensation associated with Category III habitat and MUC-L land use designation.*

Tortoise – Cumulative Impacts

Comment ISEGS-12-3: Should the ISEGS project, the DesertXpress High Speed Passenger Train, the upgrade of the 35-mile Eldorado-Ivanpah Transmission line, and the proposed OptiSolar (First Solar) power project all become a reality, impacts to the habitat supporting tortoises in this recovery unit may be insunnountable and could endanger this distinct tortoise population. These cumulative impacts are even more staggering when the facilities proposed by Nextlight Renewable Power on 7,840 acres of high quality tortoise habitat in the eastern side of the Valley are factored in.

Comment ISEGS-10-5: The lands subject to the NextLight right of way applications in Nevada, see id., Table 3 at 5-17 ("Q" and "Q") are high quality desert tortoise habitat as are those subject to the Ivanpah right of way application, see, e.g., id. at 6.2-29. Both are occupied by intact populations of tortoises. See, e.g., id. at 6.2-51. The analysis of cumulative impacts of to this species is inadequate.

Although the DEIS acknowledges that the project will cause significant impacts to wildlife, including loss of occupied tortoise habitat and fragmentation and disturbance to adjacent tortoise habitat, id. at 6.2-51, as well as the very problematic history of tortoise translocation efforts, id. at 6.2-49, it does not contain a thorough analysis of the likely cumulative impacts of these various activities. Instead it contains simple generalizations about the impacts of past and current actions on wildlife habitat, including tortoise habitat, within the Ivanpah Valley. For example, it states that "past and current actions have significantly reduced and degraded" wildlife habitat in the area and that this project, combined with future proposed projects would also significantly affect a genetically distinct subpopulation of desert tortoise." Id. at 6.2-71. It further states that "[w]hile no precise estimate can be made of the future habitat loss associated with the proposed projects listed above, collectively these projects would remove and fragment tens of thousands of acres of additional habitat" and that "[a]ll of these past, present and future proposed
activities contribute to the significant loss of Ivanpah Valley vegetation communities, wildlife habitat, and species status species." Id. These statements constitute virtually the entirety of the DEIS' treatment of cumulative impacts. While they are undoubtedly true, they do not constitute an analysis of the cumulative impacts of the Ivanpah project when combined with the many other projects proposed for this area.

Comment ISEGS-8-16b: The proposed project in conjunction with other projects in the area will have significant cumulative effects on the areas resources especially to desert tortoise, rare plants, and visual resources.

The FSA/DEIS fails to adequately consider that the population of the Northeastern Mojave ESU desert tortoises the Ivanpah Valley is unique in California and is at high risk of extirpation from the state from the cumulative effects of this project, the Optisolar (now First Solar) power project adjacent to ISEGS, the proposed DesertXpress High Speed Passenger Train, and the upgrade of the Eldorado-Ivanpah transmission line in California alone. The cumulative effect of these projects will be to convert the Northern

Ivanpah Valley Unit into a de facto solar zone and industrial zone which no longer supports multiple use nor provides habitat for desert tortoise and other wildlife.

In addition to ISEGS and Optisolar (First Solar) on the northeastern slopes of the Clark Mountains, two solar energy generation facilities are proposed by NextLight Renewable Power on 7,840 acres of public lands on the Nevada (Primm Valley) portion of the Ivanpah Valley. These lands are also high quality desert tortoise habitat with intact and robust populations of desert tortoise. The FSA/DEIS fails to adequately assess the cumulative impacts from these projects and other solar projects on the Nevada side of the border to Northeastern Mojave ESU desert tortoises. The impacts include destruction and loss of habitat, take of tortoises, habitat fragmentation, population fragmentation, loss of connectivity, and loss of viability. The cumulative impacts of these developments severely threatens the long-term survival of the Northeastern ESU desert tortoises in the entire Ivanpah basin and threatens to sever connectivity between this and other Recovery Units thus compromising recovery. Since the Northeastern Mojave population is the most genetically distinct desert tortoise population in California, protection of these tortoises may well be critical to the survival of the four other Recovery Units found in California. The cumulative impacts threaten to endanger California's Northeastern Mojave desert tortoise population, and this places the entire desert tortoise population in California at risk.

Comment ISEGS-2-34b: The Cumulative Scenario in the FSA/DEIS fails to adequately identify and analyze the scope of the cumulative impacts to various resources across appropriate scales for each impact. While the FSA/DEIS looks at the Ivanpah Valley to some extent it ignores other scales of analysis. For example, the DEIS fails to look at cumulative impacts to the biological resources in the CDCA as a whole from multiple proposed industrial scale projects particularly how sprawling industrial sites could fragment habitats and change the quality of the CDCA overall. In addition, the DEIS should have considered the cumulative impacts to the desert tortoise and its recovery at several different scales-for the Northeastern Mojave Desert Tortoise Recovery Unit in the North Ivanpah Valley within California, the Recovery Unit as a whole, the species within California, and/or the species as a whole. Each of these scales of analysis would likely reveal different information about the cumulative impacts of this project.

For example, the California population of the Northeastern Mojave Desert Tortoise Recovery Unit in the North Ivanpah Valley is unique in California and is at risk from the cumulative effects of this project, the Optisolar (now First Solar) power project adjacent to the proposed project site, the proposed DesertXpress High Speed Passenger Train, and the upgrade of the Eldorado-Ivanpah transmission line and substations in California alone.

Comment ISEGS-39-5: The recent history of the desert tortoise is that entire populations have been extirpated in numerous areas of the Mojave region due to the cumulative impacts of human activities, and the Desert Tortoise Council is deeply concerned that the cumulative impacts of ISEGS and the numerous energy projects

planned for the Ivanpah Valley may lead to the extirpation of the Northeastern Mojave (NEMO) Desert Tortoise Recovery Unit population in the Ivanpah Valley.

The developments that raise our concern are all proposed for construction within the NEMO Recovery Unit, one of the six Desert Tortoise recovery Units designated in the Desert Tortoise Recovery Plan. These populations were previously and appropriately identified based on genetics, behavior, ecology, geographic isolation, and morphology. Since the Recovery Plan was published, a number of studies have compared tortoises between different Recovery Units and confirmed biological differences among the populations. Most recently, "*A Genetic Assessment of the Recovery Units for the Mojave Population of the Desert Tortoise …* " (Murphy, et.al. 2007) presents new evidence that desert tortoises in the Recovery Unit constitute distinct populations, confirming the validity of the 1994 Plan's six Recovery Units. Each of these evolutionary significant population units faces a distinct suite of past and ongoing impacts to tortoises and supporting habitat.

Comment ISEGS-39-6: The potential cumulative impacts to desert tortoises and supporting habitat within the Northeastern Mojave Recovery Unit land area is alarming. Direct, indirect and cumulative impacts of the proposed ISEGS project on the desert tortoise include habitat destruction and loss of habitat, take of the NEMO population, population fragmentation, and compromised viability. Should the ISEGS project, the DesertXpress High-Speed Passenger Train, the upgrade of the 35-mile Eldorado-Ivanpah Transmission line, and the proposed OptiSolar (First Solar) power project all become a reality, impacts to the habitat supporting tortoises in thi recovery unit may be insurmountable and could endanger this distinct tortoise population. These cumulative impacts are even more staggering when the facilities proposed by Nextlight Renewable Power on 7,840 acres of high quality tortoise habitat in the eastern Ivanpah Valley are factored in.

***Response**: The DEIS and SDEIS acknowledge and quantify the cumulative impacts to desert tortoises and their habitat as a result of the proposed project, and the other projects referenced in these comments.*

Tortoise – Reported Baseline Information

Comment ISEGS-1-36c: The 2007/2008 protocol desert tortoise surveys found 25 live desert tortoises, 97 desert tortoise carcasses, 214 burrows, and 50 other tortoise sign. Tortoise sign and density was greatest in Ivanpah 1 at the southern boundary of the project site and was less dense as the survey moved towards the Clark Mountains and Ivanpah 3, according to the FSA/DEIS. On several October visits to the sites, we found numerous burrows on the northern part of the site, however.

Survey methodology: We believe that more surveys will need to be conducted to get a more accurate estimate of population density, such as mark-recapture or line-distance sampling. We would like to request surveys be conducted yearly to the fall of 2012.

What type of survey methods were used to declare only 25 tortoises are on the preferred project site? Any biologist will tell you that an estimate like this holds little weight. It could very well be that there are three times that many. How many surveys were conducted? Were they reconnaissance surveys? Was this number only determined by presence/absence surveys? We would like to caution the BLM against accepting these as the final numbers. Additional surveys will be needed for a more accurate estimate.

Comment ISEGS-8-6: The FSA/DEIS is unclear as to how many tortoises will be directly affected by the proposed power plant and cites only the numbers of animals seen in various surveys. Table 5 of the August 2009 survey report (Supplemental Data Response, Set 2I at 9) provides estimates of the adult tortoise densities on the Ivanpah 1, Ivanpah 2 and Ivanpah 3 sites for comparison with the later surveys performed in proposed translocation areas. As was revealed at the recent CEC Hearing that table is incorrect. Based on the corrected data, the estimated abundances are 2.9 tortoises/sq km on Ivanpah 1, 1.7 tortoises/sq km on Ivanpah 2, and 2.6 tortoises/sq km on Ivanpah 3. These values are comparable to or higher than the 1.7 tortoises/square km estimated from surveys of conservation areas within the Recovery Unit conducted during the range-wide line-distance sampling effort (USFWS 2009). The estimated densities are about the twice the number of adult tortoises encountered during surveys. Thus the estimated number of tortoises on the project site is approximately 50 adults with an unknown number of young. This does not include the unknown number of resident tortoises at the proposed translocation site that may be affected by the translocation nor tortoises that may be impacted by the increased use of roads in the area.

***Response**: The text in the FEIS has been revised to include both the actual number of tortoises identified in the surveys, and an estimate of the actual number based on other estimating methods. In the Biological Opinion for this project the USFWS estimated that approximately 35 or 36 subadult or adult desert tortoises are likely to occur within the 3,520-acre ISEGS project site and associated linears.*

Tortoise – Impact of Hazardous Materials

Comment ISEGS-1-36d: We are concerned that destructive events such as flash flooding will release chemical residues into the ecosystem, thus having the potential to intensify this problem. We would like to request a study on the impacts of hazardous materials and other toxins potentially released by the proposed project would have on desert tortoise populations relating to the disease cutaneous dyskeratosis.

***Response**: The hazardous materials to be used, and the potential for their release, was evaluated in the Hazardous Materials section of the DEIS and SDEIS. The potential for stormwater damage to the areas where hazardous materials would be used and stored was evaluated in the Soil and Water section of the DEIS and SDEIS. These analyses concluded that release of these materials outside of the project boundaries is highly*

unlikely, and therefore analysis of the impact of such an unlikely event on tortoises downstream of the facility is not reasonable.

Tortoise - Connectivity

Comment ISEGS-1-36e: Habitat Quality and Connectivity: The applicant dismisses the project site as a category three habitat and claims that the project site is not essential to maintenance of viable populations. We would like to remind BLM and the applicant that protection of the tortoise does extend outside of just critical habitat or DWMA's. The project site is located in a topographically favorable region with excellent habitat. This region of the project site is important to maintain as undeveloped because it provides connectivity between and within recovery units of the desert tortoise.

Comment ISEGS-8-8: Fragmentation of occupied desert tortoise habitat results in smaller, isolated desert tortoise populations that become increasingly susceptible to negative effects. Fragmentation is particularly problematic when population densities are low. Fragmentation decreases viability and results in isolated "pockets" of desert tortoises that are at greater risk of extirpation from stochastic events. The FSA/DEIS mentions fragmentation of habitat but does not quantify the degree of fragmentation nor does it provide an analysis of the viability of the fragmented desert tortoise populations. The proposed ISEGS site bisects the North Ivanpah Valley and will directly fragment the existing breeding population. Indirect effects of the proposed project such as increased use by vehicles and "improvement" of dirt roads will lead to further fragmentation.

The Ivanpah Valley desert tortoise population is threatened with isolation from tortoises in the rest of the Northeastern Mojave Recovery Unit by existing and proposed developments in the Primm Valley in Nevada. The proposed project will contribute to the fragmentation effects of these proposed and existing developments. These cumulative fragmentation effects must be considered and addressed.

Comment ISEGS-8-7: Connectivity between desert tortoise populations is essential to maintain gene flow and genetic heterogeneity. The FSA/DEIS mentions connectivity but provides no discussion or analysis. The FSA/DEIS at 6.2-57 states that connectivity "will be discussed in more detail below". Connectivity is then included in the list at FSA/DEIS 6.2-72 but no further detail, discussion or analysis is provided.

According to the Draft Revised Desert Tortoise Recovery Plan (at 46), connectivity between the Northeastern Mojave and Eastern Mojave desert tortoise ESUs is provided by the Mountain Pass area in California. Disruption of this connectivity poses a threat to the genetic diversity of the Mojave population as a whole. Because the proposed project will impact tortoises in the area identified as providing connectivity, impacts to connectivity between the tortoises in the Northeastern Mojave Recovery Unit and the adjacent Eastern Mojave Recovery Unit must be considered and fully addressed.

The Ivanpah Valley desert tortoise population is threatened with isolation from tortoises in the rest of the Northeastern Mojave Recovery Unit by existing and proposed developments in Nevada's Primm Valley. The BLM must also consider connectivity between the Ivanpah Valley desert tortoise population and the rest of the Northeastern Mojave ESU.

Comment ISEGS-30-15: Fragmentation of habitat should be viewed regionally and cumulative impacts to the region and to Mojave National Preserve should be addressed. The connectivity of habitat is critical to any adaptation strategy seeking to address the effects of global climate change on species. An analysis of the project's immediate impact to connected habitat, and its contribution to cumulative impacts to regional connectivity should be made.

***Response**: The impact of the proposed project on the connectivity of tortoise habitat was evaluated in the DEIS, and was one of several reasons that the Mitigated Ivanpah 3 and Modified I-15 Alternatives were evaluated in more detail in the SDEIS. The FEIS describes mitigation measures (fencing I-15 and enhancing undercrossings, habitat restoration and reclamation of closed routes in the DWMA) that would enhance connectivity for desert tortoise within the Northeastern Mojave Recovery Unit and offset project impacts to connectivity.*

Tortoise – Potential Mitigation (other than Land Acquisition)

Comment ISEGS-8-18c: The DEIS does not address mitigating impacts to connectivity at all. The principle underlying acquisition of compensation habitat is that that replacement habitat can be enhanced with additional short-term measures to compensate for the habitat that is lost. Potential enhancement actions for impacts to the Northeastern Mojave desert tortoise population in California's Ivanpah Valley include erecting tortoise barrier fencing along major roads. Fencing reduces tortoise loss, reduces road kill (and thus foraging opportunities for ravens), and effectively increases habitat available for use by tortoises. Other potential enhancement actions include removing livestock grazing and formally protecting habitat by changing its land use designation. The BLM should consider plan amendments to (a) allow buyout and retirement of grazing allotments, including the Clark Mountain Allotment; (b) reduce vehicle routes and OHV activity; and, (c) expand the Ivanpah DWMA. Including the North Ivanpah Valley within the Ivanpah DWMA and thus protecting the remaining habitat there is the only foreseeable way that the cumulative effects of the project could be ameliorated.

***Response**: The EIS acknowledges that enhancement, both in the local project area and in the acquired lands, is a valuable tool in mitigation. However, consideration of changes to land use designations and/or tortoise protection status are outside of the scope of this analysis of a single ROW application. The FEIS describes mitigation measures (fencing 50 miles of roads in tortoise habitat and enhancing undercrossings, habitat restoration and reclamation of 50 closed routes in the DWMA) that would*

enhance connectivity for desert tortoise within the Northeastern Mojave Recovery Unit and offset project impacts to connectivity.

Tortoise – Monitoring of Mitigation Requirements

Comment ISEGS-33-6: This incident is an example of why compliance monitors and biologists must be completely independent of the contractor, the BLM, and managing agencies. BIO-5, p 6.2-101, gives substantial authority to the Designated Biologist and Monitor.

The CM must be able to act independently when violations occur, without fear of job loss or other retribution. Complete independence is required. In addition, there must be a sufficient number of independent monitors to handle the workload demanded by such a large project.

Instead, BIO-1 of the FSA (p.6.2-98) requires no more than one Designated Biologist, assigned by the project owner. The mitigation measures, p.6.2-98, talks of Biological Monitors. I could not find in the FSA a specification of how many Biological Monitors are required, or qualifications, or a statement that they would be working solely under the supervision of the biologist. Please identify these, if I missed them in the documentation. Problems:

- One biologist is completely inadequate for this six square-mile project with as many as 1000 workers at a time, potentially working multiple shifts.
- It appears (BIO-1, p.6-2.98) that the biologist will be selected by and work for the contractor. This invites, does not avoid, conflict of interest. Instead, for complete avoidance of conflict of interest, and so the biologist can perform duties completely independently of the contractor, the contractor must have no part in selection of biologists. If the contractor pays for the biologist, the contractor must have no control over the biologist's continued employment or timely payment for services.
- There is no specification for Biological Monitors (that I found) .

***Response**: BLM has reviewed Mitigation Measure BIO-1, and provided additional specificity regarding the number and roles of the monitors. The agency agrees that more than one Designated Biologist and Biological Monitor will be required to monitor mitigation measures, but nothing in BIO-1 precludes the project owner from hiring as many Designated Biologists and Biological Monitors as needed. The Designated Biologist must comply with explicit reporting requirements to the BLM Authorized Officer on implementation of the mitigation measures, and the Authorized Officer retains independent authority to stop construction or operations if needed.*

Tortoise - Translocation – General

Comment ISEGS-4-2: The DEIS states the proposed project would result in the permanent loss of approximately 4,073 acres of occupied desert tortoise habitat, and that a minimum of 25 desert tortoises would need to be translocated off the project site. In addition to direct loss of habitat, the project would fragment and degrade adjacent habitat, and could promote the spread of invasive non-native plants and desert tortoise predators such as ravens. Based on these factors, the DEIS concluded the proposed project would result in impacts that would be significant with respect to NEPA significance criteria in 40 CFR 1508.27.

The DEIS proposes translocation as a mitigation measure for Project impacts to desert tortoises. However, translocation itself is known to have a significant impact on desert tortoises. The risks and uncertainties of translocation to desert tortoises are well recognized in the scientific community, and they were acknowledged in the DEIS. The Science Advisory Committee of the Desert Tortoise Recovery Office has stated desert tortoise translocation is fraught with long-term uncertainties. The high level of mortality associated with the recent Ft. Irwin translocation efforts highlights the need to refine mitigation strategies for impacts to desert tortoise. In the meantime, impact avoidance remains the only reliable strategy to maintaining viable desert tortoise populations.

Given the dangers translocation poses to desert tortoises, the California Department of Fish and Game (CDFG), U.S. Fish and Wildlife Service (USFWS), and other wildlife experts have expressed concern regarding the outcome of proposed desert tortoise translocations for the Project. Wildlife agencies and experts have requested that BLM address these concerns as part of any translocation plan approved for the Project. The DEIS provides no information on how the Project will reduce the risks and uncertainties associated with translocating desert tortoises. Despite repeated requests by wildlife agencies, the applicant has not yet provided a Desert Tortoise Translocation Plan acceptable to the CDFG and USFWS. Without details on how the translocation plan will differ from other plans (which resulted in high levels of mortality), or even the locations where tortoises will be released, translocation cannot be considered a viable form of mitigation.

Comment ISEGS-2-44: Translocation of desert tortoise in the fall is not optimal especially if summer/fall rains do not occur. If translocation must occur, flexibility in timing is essential to help to assure successful translocation to help meet the minimization standard.

Comment ISEGS-2-39: Of particular concern is the cursory and completely inadequate proposed translocation plan relied on by BLM. To date, translocation of desert tortoise always results in "taken of tortoises and certainly does not aide in the recovery of the threatened species. "Successful" relocation has been documented to have a 15-21% mortality. Significant losses of tortoises through the most recent translocation effort in 2008 - the Fort Irwin translocation - resulted in over 20% mortality within the first year. Further monitoring has documented as of August 2009, over 250 desert tortoise (38%)

have died in the translocation areas of Fort Irwin. This translocation has resulted in further declines in the west Mojave recovery unit to the detriment of recovery of the species.

The Scientific Advisory Committee of the U.S. Fish and Wildlife Service's Desert Tortoise Recovery Office has recently concluded that "translocation is fraught with long-term uncertainties, notwithstanding recent research showing short-term successes, and should not be considered lightly as a management option. When considered, translocation should he part of a strategic population augmentation program, targeted toward depleted populations in areas containing "good" habitat. The SAC recognizes that quantitative measures of habitat quality relative to desert tortoise demographics or population status currently do not exist, and a specific measure of "depleted" (e.g., ratio of dead to live tortoises in surveys of the potential translocation area) was not identified. The proposed project can hardly be considered a "strategic augmentation program".

These data and conclusions by desert tortoise experts negate any logical basis for presenting translocation as aiding in recovering the species. The risks associated with translocation in general are now well established and quite high. Because of this, the agencies need to take seriously a full and honest evaluation of the need to site projects within essential, occupied desert tortoise habitat. Siting projects in areas that lack desert tortoise will preclude the need for translocation and the inevitable mortality that translocation and relocation causes.

If translocation must occur as part of the project implementation, the translocation/relocation plan needs to be substantially improved to increase success. We provided substantial comments on the Preliminary Staff Assessment and the Draft Desert Tortoise Translocation Plan to the California Energy Commission and we incorporate those comments here by reference.

Subsequent augmentation to the translocation/relocation plan by BLM before it was provided to the Service still fails to address a number of essential desert tortoise issues.

Comment ISEGS-12-6: Further, the FSA/DEIS seriously underestimates the probable desert tortoise mortalities as a result of relocation/translocation.... The relocation/translocation of desert tortoises - even if done well - will contribute little to the long-term survival of the desert tortoises in the northern Ivanpah Valley because the habitat surrounding the ISEGS site and the relocation/translocation sites will be severely fragmented as a consequence of ISEGS. Finally, the relocation/translocation plan does not require long-term monitoring and study of the relocated/translocated desert tortoises. BrightSource Energy will simply dump the tortoises under the current plan.

Comment ISEGS-5-13a: Still, the DEIS acknowledged the dangers of translocation: "[c]apturing, handling, and relocating desert tortoises from the proposed site after the installation of exclusion fencing could result in harassment and possibly death or injury." DEIS 6.2-48. And, according to the DEIS, once a tortoise is moved outside of its home range, it will likely try to make its way back. DEIS 6.2-49. Indeed, "translocation is

fraught with long-term uncertainties, notwithstanding recent research showing short-term successes, and should not be considered lightly as a management option." Id.

Comment ISEGS-5-13b: Second, the BLM was required to disclose the adverse impacts associated with translocation itself. For example, successful translocation activities are considered to have approximately a 20% mortality rate. Recently, however, a large-scale translocation was attempted near Fort Irwin. Of the approximately 600 tortoises moved, at least 250 of them died. In reality, that mortality estimate is low, as tortoises are currently in hibernation and the full impact of the translocation efforts on the tortoise population remains to be seen. Failure to examine and disclose the recent Fort Irwin experiment violates NEPA's "hard look" requirement for the proposed mitigation measures. See Seattle AudubonSoc. V. Espy, 998 F.2d 699, 704 (9th Cir. 1993) (court found that forest service failed to take a hard look where it did not address in any meaningful way reports concluding that the spotted owl was declining more substantially and quickly then had been thought.)

In short, the Project's disclosed impacts, combined with the undisclosed impacts associated with translocation show that the Project's effects on Desert tortoise in the Ivanpah Valley could be catastrophic.

Comment ISEGS-1-36f: Translocation site: Recent translocations of tortoises at Ft. Irwin, California, however, failed and were halted, as coyotes began finding and killing large numbers of tortoises after they were moved to new locations. The California Department of Fish and Game (CDFG) and US Fish and Wildlife Service (USFWS) have concerns about the outcome of proposed desert tortoise translocations for the ISEGS project, and have requested that those concerns be addressed in any relocation/ translocation plans approved for the ISEGS project. Please address this.

Comment ISEGS-7-14a: The BLM must also consider the substantial risks posed by the Ivanpah SEGS translocation program. The U.S. Army suspended its Desert Tortoise translocation program at Fort Irwin when at least 15% of the translocated tortoises died, mostly due to predation1. Some unofficial estimates have now placed the Fort Irwin desert tortoise mortality rate at nearly 30%. Other impacts to tortoises must be fully analyzed and addressed, such as new water sources that attract predators, impacts to tortoise water sources from proposed groundwater pumping, impacts from roads, and impacts from vegetation management. For example, if additional water sources will be placed on site, it could increase raven populations within the surrounding area. A raven monitoring plan would need to be included, as ravens can have a very detrimental impact on tortoises. In addition, while the project will obviously involve roads and a great deal of traffic (particularly during construction), the project application fails to consider the use of fencing to avoid impacts to the tortoise. Roads lead to direct and indirect impacts on desert tortoise including roadkill mortality, destruction of burrows, dispersion of invasive plants, predators, development, recreation, and possibly disease (Boarman 2002). Roads and highways tend to fragment wildlife habitat and reduce the movement of animals through the landscape (Tsunokawa and Hoban 1997, Evink 2002). Road kill is the greatest human-caused source of direct mortality to vertebrate wildlife in the

United States with an estimated one million vertebrates killed per day on roads in America (Forman and Alexander 1998, Kline and Swan 1998). The cumulative impact of habitat fragmentation on desert tortoise is exacerbated by roads and the amount of habitat that they degrade (Boarman 2002).

Comment ISEGS-2-13b: Moreover, as discussed in detail below, the proposed translocation plan is not sufficiently thought through and fails to consider all of the likely impacts to the tortoise that are proposed to be moved as well as the host tortoises, or how future projects in the area may also affect these same animals and the population in the area. NEPA mandates consideration of the relevant environmental factors and environmental review of "[bloth short- and long-term effects" in order to determine the significance of the project's impacts. 40 C.F.R. 5 1508.27(a) (emphasis added). BLM has clearly failed to do so in this instance with respect to the impact to the tortoise.

Comment ISEGS-22-2: The project will have significant impacts on the Mojave Desert. Addressing these impacts is vague language that speaks to "protect and enhance offsite populations or some other form of compensatory mitigation". The Desert Tortoise is an example of a population that will have to be "translocated" when the 4000 acres is scraped to clear all existing plants, and then regularly sprayed to keep anything from growing. Removing the Desert Tortoise is a complex undertaking, if they are to survive. The Fort Irwin translocation showed how difficult, high mortality rates and high predation rates. The translocation rate from Las Vegas to Primm had a mortality rate close to 50%. And yet with previous problems, there is no plan, only language that says, "The applicant will develop a Desert Tortoise Translocation Plan". All the planning needs to be done first, which includes predation reduction details so the conditions of the Fort Irwin translocation are not repeated.

Comment ISEGS-37-1: This project is yet another land grab as this proposal would be responsible for the zeroing out of the last remaining wild burro herd in the Clark Mountain area and would have equally devastating consequences for the threatened Desert Tortoise, 26 of whom would be displaced from their habitat to make room for a project that should be moved to a less sensitive area that does not compete with native wildlife. Remember last year's disastrous relocation of 600 tortoises from their desert habitat to BLM land to make room for expanded training operations at Fort Irwin during which close to 100 animals perished. The loss of America's iconic wild burros and desert tortoises are unacceptable losses. The eradication of OUR endangered wildlife on OUR public lands for the sake of special interests must be stopped. A solar plant can be relocated. Extinction is forever. Please reconsider this most harmful proposal.

Comment ISEGS-28-11: The DT relocation plan is also wholly unacceptable as these are a Threatened Species that demand appropriate management to protect them from extinction. The recent Fort Irwin mortality rates of translocated tortoises are a clear indication that this “tool” is wholly unacceptable for species preservation of the DT’s. The damage to the desert ecosystem through grading of the soil is unacceptable as is the lifelong use of herbicides on the desert floor – especially in light of the fact that this will be occurring in environmental proximity to the Ivanpah Desert Tortoise ACEC.

Comment ISEGS-39-3: The construction of ISEGS would further conflict with the Desert Tortoise Recovery Plan goals because the project is likely to result in the death of any number of tortoises in conjunction with the relocation and translocation of animals form the proposed site. At least 38 percent of the monitored tortoises in the 2008 Fort Irwin translocation, for instance, expired. As the Desert Tortoise Scientific Advisory Committee concluded at its meeting of March 13, 2009. "... translocation is fraught with long-term uncertainties ... and should not be considered lightly as a management tool." Even small-scale translocation have had mortality rated in excess of 20 percent.

***Response**: BLM agrees that translocation poses risks for the translocated and resident desert tortoise, and are aware of the outcome of large scale translocation efforts at Fort Irwin and elsewhere. A detailed discussion of the risks and the uncertainties associated with translocation was provided in the FSA/DEIS. BLM considers translocation to be a minimization measure for desert tortoise rather than mitigation for project impacts. The applicant is currently revising their translocation plan with guidance from CDFG and USFWS, and no translocation plan will be implemented until it meets the approval of those agencies.*

Tortoise – Translocation – Lack of Plan

Comment ISEGS-5-13c: Here, the DEIS completely failed as an information document concerning plans to relocate or translocate Desert tortoise. The DEIS completely omits a translocation plan for the public and decision makers to review:...This reliance on a state agency to analyze a Project's impacts on federally endangered species and then propose mitigation for that species violates NEPA on two grounds. First, the DEIS does not even disclose where the "satisfactory translocation site" is located in relation to the Project. Failure to provide any information on the relocation plan, the principle mitigation scheme, is per se a violation of NEPA.

Comment ISEGS-7-15a: The BLM is constrained by specific policy guidance in implementing translocation programs. According to BLM Manual 1745, a site-specific activity plan is required prior to the introduction, transplant, and reestablishment of plants or animals on public lands. Additionally, decisions for making introductions, transplants, or reestablishments should be made as part of the land use planning process, and include a land use plan amendment (BLM Manual 1745). BLM has not included an activity plan or land use plan amendment in the FSA/DEIS or the Biological Assessment. This documentation will be required before a decision is made on the translocation.

Comment ISEGS-8-9a: The proposed project and the other projects proposed for the project area will require the large-scale movement and translocation of desert tortoises within the North Ivanpah Unit. Translocation of desert tortoises is highly controversial as witnessed with the BLM's withdrawal of its "Environmental Assessment for the

Translocation of Desert Tortoises onto Bureau of Land Management and Other Federal Lands in the Superior-Cronese Desert Wildlife Management Area, San Bernardino County, California Bureau of Land Management Environmental Assessment" (CA-680-2009-0058) immediately following the close of the public comment period. There is no consideration in the CDCA Plan for large scale desert tortoise translocation. Therefore, the BLM must include a detailed translocation plan for the project in its NEPA documentation.

No final translocation plan has been made available for to the public to review. The BLM must make this available for public comment prior to issuing its decision. The project applicants have identified four sites west of the proposed project as possible translocation sites. However, the northernmost of these is within the footprint of the proposed railway line and would not appear to be suitable for that reason alone.

***Response**: As part of the docket 07-AFC-5, BrightSource submitted a draft Desert Tortoise Translocation/Relocation Plan (Relocation Plan) to the California Energy Commission on March 19, 2009, with subsequent revisions on May 27, 2009, and August 13, 2009. The document was reviewed by the California Energy Commission, California Department of Game and Fish, BLM, and USFWS. Comments to the draft Relocation Plans were provided to BrightSource on April 28, 2009 and July 15, 2009. The revised plan was submitted as an appendix to the Biological Assessment from the BLM to the USFWS. Proposed relocation locations can be found within the applicant's submittals on the CEC website:*
http://www.energy.ca.gov/sitingcases/ivanpah/documents/applicant.

Mitigation Measure BIO-9, the desert tortoise translocation condition, requires the development of agency-approved final plans prior to construction or operation of the proposed project.

Tortoise - Translocation – Protections for the Translocation Area

Comment ISEGS-2-45: No mechanism is included to assure the long-term protection of the desert tortoises that are moved and the habitat into which they are moved. As the BLM is well aware, multiple projects are proposed for this same area, including the Desert Xpress high-speed rail line and an adjacent large-scale photo-voltaic project. Assurances must be included so that the desert tortoise affected by this project are not impacted again by a subsequent project. We remain concerned however, that lacking a comprehensive strategy for tortoise conservation, tortoises could be translocated/relocated multiple times, which clearly will be detrimental to the species and its recovery. The recirculated DEIS must provide these essential assurances that if tortoises are moved, they will not be moved again and that this habitat will be protected from other habitat impacting activities.

Comment ISEGS-7-15b: Additionally, BLM must ensure that the translocation lands are preserved in perpetuity. BLM must not allow right-of-way applications on areas that effectively become surrogate desert tortoise habitat due to a translocation program.

Comment ISEGS-8-9b: Desert tortoises may make long-distance movements following relocation (FSA/DEIS at 6.2-50). Because of this, it is critical that fencing along I-15 be in place prior to any tortoise translocations being are undertaken because translocated or relocated tortoises may make long distance movements. This must be specified in the translocation plan component of the EIS.

Response: Any changes to the protection status in the translocation lands would require analysis within the context of the NEMO Planning unit as a whole, and would only be considered in light of the availability of new supporting data. In the interim, BLM cannot guarantee protection of the translocation lands..

Tortoise - Translocation – Suitability of Translocation Area for this Purpose

Comment ISEGS-11-8: Plant Surveys were performed in July/August 2009 to determine whether habitat quality of proposed desert tortoise translocation areas were of equal or greater quality than the habitat quality at the project site. This comparison used measures of perennial shrubs and succulent species abundance, richness, and diversity as surrogate indicators of desert tortoise habitat quality. The survey rationale, design, methods, and analysis contain flaws that call into question the validity of conclusions presented in the report, Vegetation Surveys for Potential Relocation and Translocation Areas (in Applicant's Supplemental Data Response, Set 2I, August 10, 2009).

An accurate assessment of desert tortoise habitat quality must take into account the quantity and quality of food sources available. Highest quality food for desert tortoise are native annual plants, whose protein and water content provide the optimum opportunity to rehydrate and flush salts concentrated during hibernation from their bladders, and to accumulate the energy necessary to mate successfully (Pavlik 2008). The surveys were conducted in the middle of summer when few annuals are present.

The report does not provide a rationale for the number of sampling sites chosen, or whether the sites were chosen at random. No statistical test was performed to compare similarities/differences between project and proposed translocation sites, so conclusions cannot be confirmed to any level of significance.

Comment ISEGS-4-6: At the request of the CDFG and the CEC staff, the applicant conducted vegetation sampling at several sites proposed for desert tortoise translocation. Results of those surveys support the Sierra Club Alternative. Specifically, they indicated that approximately half of the sampling locations in the vicinity of I-15 had plant species richness too low to be viable for desert tortoises (CDFG's criteria for the translocation areas was that they have comparable ecological make up as the habitat where the tortoises currently reside). Therefore, lands adjacent to I-15 lacked enough plant diversity to support desert tortoise.

Comment ISEGS-2-41: Neither the Biological Assessment, the DEIS or the translocation plan submitted to the service by the BLM actually evaluates the carrying capacity of the translocation/relocation sites, and their ability to support greater tortoise densities over the long-term. While a die-off of tortoises is known from the Ivanpah Valley in the 1990's, there is no evidence presented in any of the documents that the habitat has the capacity to provide resources to sustain over the long term a higher density population. In light of global climate change and its effects currently occurring on the desert, the habitat may simply not be able to support a more concentrated population now or into the future. The recirculated DEIS must evaluate the carrying capacity of the translocation/relocation sites to actually support both the host and translocated tortoises.

Comment ISEGS-5-13d: According to the Recovery Plans, an integral factor in tortoise recovery "is maintaining the genetic and ecological variability known to exist within and among populations. This variation is necessary to allow tortoises to adapt to changes in the environment over time." 2008 Draft Recovery Plan at p. 30. Also, because Desert tortoises occupy large home ranges, the "longterm persistence of extensive, unfragmented habitats is essential for the survival of the species."
Id. For this reason, translocating or relocating Desert tortoise either adjacent to I-15 or adjacent and west of the Project, will not work. Tortoises would essentially be stuck between two inhospitable habitats, curtailing their range. The DEIS acknowledges the potential dangers, but offers no other alternatives to the Project that would not translocate the tortoises into potentially fragmented habitat.

Comment ISEGS-1-36g: The FSA/DEIS provides little information on the translocation site and survey protocol that was used to determine the feasibility of the site. We are concerned that the applicant did not follow protocol during the surveys of the translocation site. We feel that the following questions deserve an answer and that the applicant should be more cooperative about sharing this basic information. The below issues concerning the translocation plan remain unresolved in our view:

1. Please submit copies of all desert tortoise pre-project survey data sheets.
2. Please submit resumes of Southern Nevada Environmental, Inc (SNEI) surveyors.
3. Please indicate the personnel that had a minimum of 60 days prior field experience searching for desert tortoises and tortoise sign.
4. For surveyors without 60 days prior field experience, provide a discussion of how surveyors were trained and any measures that were taken to ensure they obtained accurate survey results.
5. Please provide dates and times of tortoise surveys. If surveys were not conducted during appropriate seasons (April through May and September through October) as determined by U.S. Fish and Wildlife Service (USFWS) April 2009 Pre-Project Field Survey Protocol (http://www.fws.gov/ventura/speciesinfo/protocols_guidelines/docs/dt/DT_Preproj ect_SurveyProtocol_2009_FieldSea son.pdf), please explain the reasons. Was

approval granted for any survey work conducted outside the spring and fall seasons by USFWS and California Department of Fish and Game (GDFG)?
6. If surveys were conducted outside recommended USFWS protocol seasons, please discuss how survey numbers would be as accurate as those obtained during optimal activity seasons.
7. Please provide temperature data collected during surveys. Were surveys conducted when air temperatures were above 40 degrees Celsius?
8. Please indicate whether any desert tortoises were handled during Project surveys. If tortoises were handled, please provide documentation of the section 10(a)(1)(A) permit(s) issued by the USFWS authorizing handling.
9. In the ISEGS Supplemental Data Response Set 2J, SNEI indicates that rainfall estimates were not obtained on site, but at higher elevations from Mountain Pass in different habitat, and approximately 50 miles away at Las Vegas. Please discuss how tortoise abundance estimates may be skewed by rainfall estimates that are not on site.
10. In the ISEGS Supplemental Data Response Set 2J, SNEI concludes that drought may be the prime cause for a possible decline in tortoises on the site. Please discuss why other potential causes for this decline were not discussed, such as disease, subsidized predation relating to the interstate highway, and livestock use.

Comment ISEGS-7-14b: The Biological Assessment identifies translocation as a mitigation measure. It is important to note that translocation is not mitigation. Translocation is a minimization measure for the take of desert tortoises on the site. However, the project will result in take of all desert tortoises on the site and cannot be mitigated by translocating individual tortoises. Additionally, the proponent's consultants observed at least 25 desert tortoises on the site during surveys. Based on those surveys, at least 50 desert tortoises are likely to be found on the site. Therefore, the proponent's statement that "the proposed action would likely result in the translocation of 25 tortoises" is incorrect (Biological Assessment, page 5-1). At least 50 tortoises will likely need to be translocated. Finally, surveys of the translocation area were completed in July and August of 2009 outside of the protocol survey season (Biological Assessment, page 4-6). Therefore, the proponent does not currently possess adequate knowledge of the desert tortoise population in the translocation area to develop a sufficient translocation plan.

Comment ISEGS-7-15c: As stated above, Defenders does not believe that translocation, in and of itself, provides mitigation for desert tortoises. Instead, any translocation must be in conjunction with the preservation of habitat. Further, the Translocation Plan should follow the recommendations of the USFWS Desert Tortoise Recovery Plan, including: a) No experimental translocations into DWMAs. b) Translocations should be made to appropriate habitat. The EIS should justify its selected translocation site. BLM should also explain the adequacy of the non-protocol surveys that were completed. c) Areas into which desert tortoises are to be relocated should be surrounded by a desert tortoiseproof fence or similar barrier. The fence will contain the desert tortoises while they are establishing home ranges and a social

structure. d) The best translocations into empty habitat involve desert tortoises in all age classes, in the proportions in which they occur in a stable population. The EIS should discuss the population structure in the proposed translocation area. e) The number of desert tortoises introduced should not exceed the pre-decline density. f) All tortoises identified for potential translocation should be medically evaluated in terms of general health and indications of disease, using the latest available technology, before they are moved. g) If desert tortoises are to be moved into an area that already supports a population - even one that is well below carrying capacity - the recipient population should be monitored for at least 2 years prior to the introduction. Necessary data includes the density and age structure of the recipient population, home ranges of resident desert tortoises, and general ecological conditions of the habitat. Any translocation sites should be isolated by a desert tortoise barrier fence or similar barrier next to the highway or road. The purpose of fencing the highway is obvious - to keep translocated animals from being crushed by vehicles on the road. The FSA/DEIS is unclear about the level and extent of fencing.

Comment ISEGS-8-9c: The tortoise densities on these proposed translocation sites are unknown since adequate surveys have not been performed. However, if the tortoise densities are comparable to those on the project site then translocation is likely to double the densities on the translocation sites. If the tortoise densities on the proposed translocation sites are lower than the project area, the ecological conditions underlying this need to be examined and explained.

The surveys on the translocation sites referenced in the DEIS were performed outside the protocol season (PSA/DEIS at 6.2-50). The USFWS protocol survey relies on using standard values for estimating the proportion of desert tortoises above ground and available for detection (Pa). These Pa values are based on average proportions of transmittered tortoises found above ground from earlier range-wide line-distance sampling surveys conducted during the spring survey season. Tortoise activity is highly seasonal. The proportion of tortoises above ground changes with time and may decrease dramatically in July. Because of this, use of the standard Pa values for surveys conducted outside the season will underestimate abundance. A reasonable estimate of the abundance of tortoises in the relocation areas is essential to evaluate potential impacts to resident tortoises from the proposed relocation. The density of tortoises on the project site and the density of resident tortoises in the proposed relocation and translocation areas should be determined using appropriate survey techniques so that the extent of the impacts can be determined.

The habitat surveys conducted in the relocation areas do not include surveys of the annual plants that tortoises depend upon for their survival (USFWS 1994). The nutritional status of wild tortoises may depend more on availability of plant species of high nutritional quality than on overall amounts of annual vegetation (Oftedahl and Allen, 1996). Without data on the quantity and quality of available forage it is unclear if the current carrying capacity of the proposed relocation sites is sufficient to support additional tortoises. The is important since the 1984 status report tortoise density map of the Ivanpah Valley (Berry et al., 1984 Plate 6-13) indicates that historic tortoise

densities in the North Ivanpah Valley were not uniform and may have been lower at the translocation sites compared to the project site.

BLM Handbook 1745 requires that activity plans for translocations must be site-specific and include "Site-specific and measurable vegetation/habitat population objectives which are based on existing ecological site potential/condition, habitat capability, and other important factors." The DEIS does not adequately describe existing ecological conditions nor does it address the capacity of the habitat at the translocation sites to support additional tortoises. It has been established that livestock compete with desert tortoises for important food plants (Avery and Neibergs, 1997; Avery, 1998). The BLM must analyze impacts from competition for food plants by cattle on the likely success of translocating tortoises to these sites and provide mitigation for any impacts identified.

***Response**: The Biological Assessment includes an evaluation of impacts to desert tortoises, including those associated with the translocation of individuals. It is the responsibility of the USFWS to review the document and determine, based on their expertise, whether the conclusions reached within the Biological Assessment are valid. If the USFWS agrees with the findings of the Biological Assessment, they will issue a Biological Opinion, which may include additional mitigation or conservation measures. Alternatively, if the USFWS determines there are substantive residual impacts, even with the application of additional mitigation measures, they will issue a jeopardy opinion in the Biological Opinion that would prevent the Project from moving forward as proposed.*

Tortoise - Translocation – Consideration of Disease

Comment ISEGS-2-40: The health of the desert tortoises that are on the site and proposed for translocation as well as the "host" tortoises in areas into which the translocated tortoises will be moved are simply not addressed. Regardless of the proximity of the translocated and host tortoises, data still needs to be collected on the state of the population at a minimum to help inform the results of the translocation. If disease is present in either the translocated tortoises or "host" tortoises, concentrating tortoises into off-site areas may exacerbate disease transmission and outbreaks especially coupled with the stresses of translocation/relocation, competition for scarce resources, defense of existing territories (host population), establishment of new territories (relocated population), etc.

Comment ISEGS-12-5: There has been no study of the host populations nor will the applicant be required to complete a study of the host populations at the relocation/translocation sites to establish population densities and the health of the host desert tortoises. There is no requirement in the relocation/translocation plan that the desert tortoises be fully inspected for disease, raising the possibility that the relocation/translocation of tortoises from the ISEGS site could spread disease into a healthy host population.

Comment ISEGS-1-36h: Health status: What is the health status of this population? Were any symptoms of Upper Respiratory Tract Disease detected? If so, was this just a visual survey? Will desert tortoise be given the ELISA blood test before they are translocated? We would like to request that the applicant be required to conduct blood work on all tortoise to be translocated. Cutaneous dyskeratosis is a shell disease that has unknown implications on desert tortoise populations. In advanced cases, exposed areas become infected with bacteria, fungus, and exposed tissue and bone may become necrotic. Cutaneous dyskeratosis has been identified on the Ivanpah Desert Wildlife Management Area. Hypotheses for the cause of the disease include autoimmune diseases, exposure to toxic chemicals (possibly from mines, or air pollution), or a deficiency disease (possibly resulting from tortoises consuming low-quality invasive plant species instead of high-nutrient native plants).

Comment ISEGS-8-9d: Environmental stressors may contribute to disease outbreaks in desert tortoise populations particularly Upper Respiratory Tract Disease (Sandmeier et al., 2009). The BLM should require that the health status of resident and translocated tortoises be evaluated so that movement of Mycoplasma infected tortoises can be controlled.

***Response**: The potential for disease is a major reason for favoring adjacent locations for translocation. Preliminary guidance from the USFWS is that any tortoise that needs to be moved over 500 meters will be tested prior to being relocated and released. Tortoises moved to the Mojave National Preserve headstart facility will be isolated on site and tested prior to moving to the final translocation area. Resident populations in the translocation areas will also be tested prior to receiving additional tortoises. If an infected tortoise is found in the translocation receiving area, no additional tortoises will be relocated within 500 meters of the infected tortoise.*

Tortoise – Translocation – Standard for Success

Comment ISEGS-2-43: The goals of the translocation plan are proposed to 1) translocate/relocate all desert tortoises from the fenced sites to nearby suitable habitat; 2) minimize impacts on resident desert tortoises outside fenced areas; and 3) assess the success of the relocation effort through monitoring. As stated, none of the goals propose a successful translocation/relocation effort. The draft translocation /relocation plan completely fails to address goal 2. We could find no success criteria identified in the translocation/relocation plan. Despite monitoring being proposed, it is not tied to anything - triggers for action, adaptive management, or success critieria. Clearly much work remains to be done on the translocation/ relocation plan in order to make it meaningful, responsive and a benefit to desert tortoise.

The draft translocation/ relocation plan completely lacks any "adaptive management" and triggers for action if/ when problems occur during the translocation/ relocation or on the translocation /relocation sites. Benchmarks for success need to be identified and additional requirements put in place to mitigate failures of this experimental proposal.

While we understand the pressures of finalizing permits to access funding from the American Recovery and Reinvestment Act of 2009 prior to the December 2010, the rushed timeline is no excuse for an inadequate plan.

Comment ISEGS-2-42: Not only should the translocated tortoises be monitored but it is essential that the "host" tortoises also be monitored, to truly evaluate the status of the translocation. One of the goals of the plan includes "Minimize impacts on resident desert tortoises outside fenced areas". However, no monitoring of this part of the population is proposed, so it would be impossible to evaluate the impacts on the resident population. Clearly much more rigorous monitoring needs to be included.

***Response**: BLM has revised the text of the Mitigation Measure BIO-9 to provide for additional monitoring and actions in response to the identification of opportunities to improve success.*

Tortoise – Compensation - Ratio

Comment ISEGS-21-1: First, the Ivanpah SEGS would cause irreparable harm to the threatened desert tortoise and other sensitive animal and plant species. The FSA notes that at least 25 desert tortoises will have to be relocated from the 4,000-acre project site. Some of these tortoises will die from this relocation. Also, this project will hamper the recovery of the desert tortoise because it will destroy more than 4,000 acres of relatively pristine, intact habitat. If this disturbance does occur, Bright Source should be required to mitigate the project at a 5:1 ratio instead of the 3:1 ratio proposed by the FSA. This will not compensate for the tortoises and habitat that will be lost, but it will ensure that the value of intact habitats and landscapes is acknowledged.

***Response**: The NEMO Plan amendment established a 1:1 compensation ratio for Category III habitat. The 3:1 ratio is a state requirement, and is outside of BLM's authority to require.*

Tortoise – Compensation – Location and Suitability of Compensation Lands

Comment ISEGS-12-4b: However, acquisition of habitat in the Eastern Mojave Unit will not mitigate impacts to the Northeastern Desert Tortoise Recovery Unit, the specific segment of the Mojave desert tortoise population that will be adversely affected by ISEGS. Acquiring mitigation lands "as close to the ISEGS site as possible ... " is not scientifically justifiable and would not meet the goals of the Desert Tortoise Recovery Plan. The only acceptable compensatory mitigation for the cumulatively significant loss of the Ivanpah Valley's biological resources would be the acquisition of lands that can be improved, protected and maintained to support a healthy Northeastern desert tortoise population.... The loss of habitat and the loss of one population cannot be mitigated through actions with respect to another Recovery Unit. In the absence of sufficient habitat within the Northeastern Desert Tortoise Recovery Unit within California

to achieve compensatory mitigation - the situation with respect to ISEGS - the only option for the BLM is to select the No Project/No Action Alternative.

Comment ISEGS-27-1a: This 4,073 acre project proposes 12,000 acres to be set aside, at a 3:1 ratio, as mitigation for impacts to the desert tortoise. The set-aside of this 12,000 acres should be specifically identified as to location, and at that scale, requires its own CEQA and NEPA analysis.

Comment ISEGS-30-12: 3:1 Mitigation ratio at a proposed $500.00 per acre does not address the realities of land availability or purchase price of parcels within the Ivanpah Valley and adjacent region. If small parcels are acquired, they will not provide the connectivity or opportunity for recovery for Desert Tortoises. Additionally, the smaller the parcel, the higher the price. An updated figure should be required for mitigation, and impacts to wildlife corridors or migration routes should be mitigated for, or addressed and listed as unable to be mitigated.

Comment ISEGS-8-18d: Desert washes, drainage systems, and washlets are very important habitats for plants and animals in arid lands. Water concentrates in such places, creating greater cover and diversity of shrubs, bunch grasses, and annual grasses and forbs. The topography is often more varied, as are soil types and rock types and sizes, creating diverse sites for burrows, caves, and other shelters. The resulting "habitats" tend to attract more birds, mammals, reptiles, and invertebrates. Desert tortoises, for example, spend disproportionately much more time in wash habitat than they do in "flat" areas (Jennings 1997). Acquired compensation habitat must therefore include comparable acreages of wash habitat. If "nesting" of mitigation is allowed, the provisions must ensure that the loss of rare plant populations and individual plants will be adequately compensated.

Response: *BLM has determined that federal 1:1 tortoise compensation funds will be spent on enhancement projects. The identification of specific, available parcels for acquisition with willing sellers has not been completed, and it is therefore impossible to specifically identify the lands to be acquired at this time. However, the lands proposed for acquisition require the approval of BLM, USFWS, CDFG and the Energy Commission.*

12.3 Biological Resources - Vegetation

Vegetation – Reported Baseline Information

Comment ISEGS-2-15: Several rare plants were found on the proposed project site including the Rusby's mallow which is a BLM sensitive species. Management of special status species (and indeed all rare species) on BLM lands should focus on ensuring long term survival and recovery in order to prevent the need for future listings. Nothing in the DEIS shows that the BLM took into consideration these critical management concerns. See BLM Maunal6840.2.C (Implementation) ("BLM shall manage Bureau

sensitive species and their habitats to minimize or eliminate threats affecting the status of the species or to improve the condition of the species habitat, by . . . [ensuring that BLM activities affecting Bureau sensitive species are carried out in a way that is consistent with its objectives for managing those species and their habitats at the appropriate spatial scale . . . [and] [considering ecosystem management and the conservation of native biodiversity to reduce the likelihood that any native species will require Bureau sensitive species status").

The Center incorporates by reference here the comments and information submitted by the California Native Plant Society on issues related to rare and special status plants. As CNPS and others have shown, the DEIS failed to adequately analyze the impacts that the proposed project would have on rare and special status plant species including direct, indirect and cumulative impacts to these plants and failed to adequately identify and evaluate potential alternatives that would avoid or minimize the impacts of the project on these species.

Another major failure of the DEIS is the lack of late Summer/early fall-flowering plant surveys on the proposed project site. Approximately 40% of the plant taxa in Ivanpah Valley flower in late summer/early fall due to its location and bimodal precipitation regime. Twenty to twenty-five special status plants that have potential to occur on the site flower in the summer/fall. The spring surveys would fail to document most of these summer/early fall-flowering rare plants on site.

While the spring surveys for rare plants were rigorous, as identified in the DEIS, absent adequate precipitation (as in the 2007 surveys) many fewer rare plants were documented than in the subsequent much moister year of 2008. Additionally because of the vagaries of precipitation in the Mojave desert, surveys should be performed over a number of years during both the spring and summer/fall flowering seasons in order to maximize the probability of identifying all special status species that occur on the project site. Projects of this size and potential impact typically include more than two years of surveys. Without an accurate inventory of plant taxa that occur on site, it is not possible to fully assess project impacts to special status plants and therefore meaningful mitigation cannot be developed.

The Eastern Mojave Desert is a botanical frontier where in the past few years alone, a number of very significant botanical finds have occurred and more are to be expected. For example, at least five species previously undocumented within the CDCA boundaries have been documented in the last few years directly on or adjacent to the project site. Additionally, these species that are found on the "edges" of their range are incredibly important for species persistence especially in light of global climate change.

Because of the lack of comprehensive surveys, the impact analysis can not evaluate the true impacts to rare plants from the proposed project.

We are concerned that the impacts to the documented on-site rare plants have been determined to be significant, but no efforts have been made to further reduce these

impacts by developing alternatives within and outside of the Ivanpah Valley. We believe there are additional sites for the proposed project that have far fewer impacts to rare plant species (and other species), yet they have not been fully evaluated (see discussion in Alternatives section).

Comment ISEGS-2-16a: Several rare plant communities may be present on site including creosote bush-white bursage scrub associations occurring with Pleuraphis rigida (Big galleta grass), and "those with a diverse shrub layer are G1/SIn (DEIS at pg. 566). The GIISI (Global1 State) status rank means that the plant community is considered globallylstate uncommon with "fewer than 6 viable occurrences worldwide/statewide, and/or up to 518 hectares" (DEIS at pg. 45). The Ivanpah site plant community has both galleta grass and a diverse shrub layer, suggesting that these rare plant communities do indeed occur on the proposed project site. However the DEIS fails to identify the presence of these plant communities, quantify the acreage on site, avoid impacts or analyze the impacts from the proposed project, and if impacts are unavoidable, mitigate for any impacts.

Comment ISEGS-1-44a: Rusby's desert-mallow is considered by the California Native Plant Society to be especially of concern, and is on its List 1B - Rare, threatened, or endangered in California and elsewhere. Rusby's Desert-Mallow is a California endemic perennial herb; it is documented globally from less than 30 occurrences in Inyo and San Bernardino Counties in the Death Valley Region and eastern Mojave Desert in the Clark Mountain Range. It has a California Natural Diversity Database state rank of S2 (imperiled). It occurs in the Clark Mountain Range at Ivanpah Springs, on desert slopes and gravelly sandy washes and often in carbonate and limestone substrate, extending into the project area. This plant is also a BLM-sensitive plant species detected on site. This plant would be significantly impacted by the project, its range fragmented and individual plants and seeds in the soil potentially destroyed. Impacts are unmitigable, and therefore the project should avoid this area completely.

Mojave Milkweed is limited to a very small area in eastern San Bernardino County. Currently, it is known from less than 25 occurrences, 16 of which occur in Ivanpah Valley in the project area. Its distribution outside of Ivanpah Valley is limited to a few very old historic collections and only two other populations that have been confirmed extant. This plant also occurs in Arizona, New Mexico, and Nevada but it has a California state rank of S1 (critically imperiled and vulnerable to extirpation from the state due to extreme rarity). Similarly, impacts to this species are unmitigable and the project should avoid this area.

Other rare plants are somewhat more widespread, but taking into account the cumulative impacts of the dozens of other large utility-scale solar applications pending in the desert, this is little comfort: Small Flowered Androstephium (Androstephium breviflorum), Utah Vine Milkweed (Cynanchum utahense), and Desert portulaca (Portulaca halimoides).

Surveys were not carried out in for summer-rain germinating species, and thus several plant types may have been missed or under-represented. Fall surveys should be undertaken, for this summer-rain influenced part of the Mojave Desert.

Comment ISEGS-11-5: Approximately 40% of the plant taxa in Ivanpah Valley flower in late summer/early fall. Of these, 20-25 potential special status plants flower in the summer/fall. All of these plants require ideal conditions for growth. Surveys, no matter how thorough, when performed during seasons and in years in which specific growth conditions are absent may fail to record the presence and/or full range extent of rare plants in desert habitats.

The floristic surveys conducted by the applicant during Spring 2008 were performed well, and by well qualified field personnel. However, floristic surveys for desert rare plants must be performed by qualified botanists over a number of years during both spring and summer/fall flowering seasons in order to maximize the probability of identifying all special status species with the potential to occur on the project site. Without an accurate inventory of plant taxa that occur on site, it is not possible to fully assess
project impacts to special status plants and therefore meaningful mitigation cannot be developed.

Furthermore, the Eastern Mojave Desert is a botanical frontier where in the past few years alone, there have been a number of very significant botanical finds and where more are to be expected. Examples for Ivanpah Valley include, Amaranthus crassipes (near Nipton, new to California (CA)), Oenothera cavernae (Primm to Clark Mountain, new to CA), Muilla coronata (a 70-mile eastern range extension, new to Eastern San Bernardino County), Leptochloa uninervia (from near Nipton, new to the Mojave Desert). The M. coronata was found just west of the proposed ISEGS project area at the base of Clark Mountain in early spring. By the time surveys of the proposed ISEGS site were conducted in late April and May,
M. coronata plants had dried and were not observable during the spring surveys. This later example illustrates how surveys conducted when growth conditions are adequate (as they were in spring of 2008), may be too narrow in their window of timing to detect important rare plant occurrences.

The FSA report's Special-Status Plant Impact Avoidance and Minimization Measure (BIO 18) requires the applicant to conduct pre-construction surveys for both spring and summer/fall blooming taxa but only within the specified project areas. Vegetative structures of some of the spring flowering rare plants occur in localities other than those mapped the previous year. Since the purpose of preconstruction surveys is to quantify each taxon's occurrence on site, pre-construction surveys should be conducted on all project lands that are undeveloped at the time surveys are performed in order to obtain a full accounting of plant occurrences (e.g., Asclepias nyctaginifolia spreads underground and sends vegetative clones above ground in different locations year after year; Enneapogon desvauxii is an annual grass and so its distribution is ephemeral year to year). Since summer/fall surveys have yet to be performed at the project site, there is

no baseline information on the presence and extent of these taxa. Therefore, summer/fall surveys need to be conducted throughout the entire site before any construction begins in order to obtain a full account of special status species on site.

Comment ISEGS-1-47: The applicant decided that no rare plant communities are present at the site. A cursory look around, however, and comparison with source material, makes us question this finding.

In A Manual of California Vegetation, second edition, by John O. Sawyer, the authors say that for the Larrea tridentata-Ambrosia dumosa Shrubland Alliance (Creosote bushwhite burr sage scrub): "The presence of several non-native plants, particularly Brassica tournefortii, Bromus spp., and Schismus spp., has greatly increased fire frequencies and led to the degradation and destruction of many hectares of this alliance. Long-term, intensive grazing, OHV activity, mining, and military operations have also left their mark.... We need to identify, monitor, and manage areas free of these degrading influences" (page 568).

The Ivanpah Valley fan site is just such a large intact area of creosote-bursage scrub that is relatively free of weeds, has only light (and easily reversible) grazing, almost no off-roading except on three designated tracks, and no other development disturbance. We recommend it be preserved and protected. In addition, the authors state that such associations with Pleuraphis rigida (Big galleta grass), and "those with a diverse shrub layer are G1 S1" (page 566). The G1 S1 (Global 1 State 1) status rank means the plant community is rare and has "fewer than 6 viable occurrences worldwide/statewide, and/or up to 518 hectares" (page 45). The Ivanpah site plant community has galleta grass and a diverse shrub layer and is worthy of more studies to determine its status. A quick check of the California Natural Diversity Database (http://www.dfg.ca.gov/biogeodata/vegcamp/pdfs/natcomlist.pdf) shows other rare communities that could be present on the Ivanpah site: …

Comment ISEGS-7-19a: The FSA/DEIS details impacts to some plant species, particularly the barrel cactus, Mojave yucca, desert pincushion, nine-awned pappus grass, Parish's club-cholla, Rusby's desert mallow and Mojave milkweed. However, the original plant surveys were admittedly conducted during a dry year. Surveys, no matter how thorough, when performed during seasons and in years in which specific growth conditions are absent, may fail to record the presence and/or full range extent of rare plants in desert habitats. Indeed, given the diversity of native plants found on the project site during a dry year survey, we believe that this site contains a large number and extent of rare plants.

Response: *BLM acknowledges the importance of ensuring the long-term survival of sensitive plants and the need to prevent future listings of those species under the Endangered Species Act. BLM and the Energy Commission staff analyzed the direct, indirect, and cumulative effects to special-status plants in great detail in the FSA/DEIS, and the Energy Commission staff concluded that the direct, indirect, and cumulative effects to special-status plants of the State was significant in a CEQA context. This*

concern led the Energy Commission staff to require that the Applicant avoid areas of the highest rare plant density and diversity, and in a way that ensured long-term sustainability and connectivity with adjacent undisturbed populations and the Clark Mountains. Energy Commission staff rejected the Applicant's first mitigation proposal; this ultimately led to the development of the Mitigated Ivanpah 3 proposal, which is similar to the Reduced Acreage Alternative analyzed in the FSA/DEIS. Many other alternatives, both within and outside of Ivanpah Valley, were considered in the FSA/DEIS, including a Private Land Alternative. The Private Land Alternative would have significantly reduced impacts to biological resources, but was eliminated because it could not substantially reduce impacts without creating significant impacts of its own (particularly to archaeological resources).

*The Mitigated Ivanpah 3 avoidance plan, combined with the avoidance, minimization, and compensatory mitigation measures in the revised **BIO-18**, would substantially minimize the Project's direct, indirect, and cumulative impacts to special-status plants. BLM agrees that transplantation has unproven efficacy and rejected earlier proposals involving artificial methods of ex-situ conservation as mitigation; collection of seed and other propagules is included in **BIO-18** only as a remedial action of last resort in the event that the preserved areas fail to meet the minimum success standards.*

The rare plant surveys at the ISEGS site were conducted according to required protocols, were extensive, covered multiple years, and were planned and conducted by an experienced professional botanist in consultation with local experts..

Vegetation - Mitigation

Comment ISEGS-1-44b: We agree with the California Native Plant Society that there are no known techniques to mitigate for the loss of rare plants and their habitat in desert environments. Avoidance is the only mitigation that is appropriate for this site. There is no known method to compensate for the loss of this rare plant habitat. Simple habitat acquisition for the desert tortoise cannot provide adequate compensation for the loss of this high quality rare plant habitat. To be able to find comparable compensation habitat for the rare plants will require an enormous amount of fieldwork to survey private lands that might be occupied. Simple translocation of the adult plants does not perpetuate population structures for long-term productivity and is an unproven mitigation for habitat destruction. The scale of destruction of subsurface ecosystem components and seed banks is impossible to mitigate.

Currently, there are no known mitigation actions that are successful for desert plants and habitats. The only legitimate option is, no approval at this location. If approved for this location, a land compensation ratio should be at least 5:1, especially in light of the massive push for energy development in the desert and the projected cumulative effect generated from similar projects.

Transplantation was brought up, but studies have found that, even under optimum conditions, transplantation was not effective in 85 percent of cases. The California Native Plant Society has an official policy opposing transplantation. Even if avoidance for any rare plants could be achieved, this plan still allows the habitat of these species to be carved up and fragmented, creating islands of habitat isolated from other populations and potentially even pollinators due to the heat created by the project's sun-reflecting and concentrating design. This does not provide adequate minimization to the severe impacts to these populations.

Cacti: We strongly suggest no cacti be sold from the site if the project is approved.

***Response**: The agency agrees that avoidance is the best strategy for mitigation of rare plants and communities. BLM has worked with CEC, the applicant, and the intervenors to maximize avoidance to the extent practicable, and to maximize the effectiveness of transplanting for areas where avoidance is not practicable. However, compensation for rare plants is not within BLM's regulatory authority to require.*

*The Energy Commission staff has proposed Condition of Certification **BIO-18** that includes requirements for special-status plant avoidance and minimization measures, protection goals and monitoring requirements. **BIO-18** led to the applicant's Mitigated Ivanpah 3 proposal that Energy Commission staff believes together can lessen plant impacts to less than significant. BLM and Energy Commission staff worked with intervenors, Applicant, and consulted recognized experts in desert ecology in the development of the Mitigated Ivanpah 3 avoidance plan, which avoids the areas of highest density and diversity in the northern portion of ISEGS 3 and in the Construction Logistics Area, and along the pipeline route. BLM agrees that transplantation should not be relied upon to mitigate impacts, and does not—mitigation is achieved through avoidance and minimization. Seeding and topsoil salvage are included in **BIO-18** only as a last resort remedial action and to minimize impacts in areas where impacts are temporary and restoration is possible (e.g., the pipeline alignment). The Applicant is also required to minimize the width of the work area along the pipeline.*

Vegetation – Invasive Species

Comment ISEGS-2-16b: Additionally, the DEIS recognizes that the proposed project site supports very few nonnative plant species (weeds) (DEIS at pg.6.2-9), indicating that the site has a very low level of disturbance (weed occurrence is directly correlated with disturbance). While the proposed Weed Management plan will likely minimize the spread of weeds across the site and potentially beyond if implemented properly, the fact remains that due to the fragmentation of habitat from road and fence building and general site activities the project will likely be a seed source for weeds to disperse into the surrounding natural area. The relatively low occurrence of weeds is another factor that BLM should have more fully considered in the DEIS in the context of the planning area as a whole. Areas with low weed occurrence are increasingly rare in the California desert and the remaining areas should be protected.

Comment ISEGS-8-14: The FSA/DEIS fails to fully analyze the project's direct, indirect, and cumulative effects on the spread of invasive weeds and the potential increase in wildfire risks. Water run-off from the washing the mirrors will promote invasive plant growth year-round and increased use of the area will help disperse invasive plant seeds throughout the area. The DEIS does not explain how invasive species will be controlled on the project site.

Comment ISEGS-1-25: Weedy successional growth will most likely grow as mirror wash-water falls to the ground during bi-weekly washing. In cooler seasons this would probably result in the increased growth and spread of invasive Red brome grass (Bromus madritensis ssp. rubens), an annual from Europe that favors disturbed ground, as well as various introduced mustards (Brassica spp.). In the summer it would likely be Arabian splitgrass (Schismus spp.). To take care of this secondary problem, the applicant will carry out a weed management policy and apply "soil binders and weighting agents to minimize dust accumulation on the mirrors and fugitive dust as could occur by wind or vehicle traffic" (page 1-9). What are these soil binders, and are they petroleum products?

What herbicides would be used to remove vegetation from under the heliostats? How will these toxins be prevented from getting into the ground and groundwater? What effects, short-term and long-term would the use of these chemicals have on public health? Will local landowners be at risk? How will these herbicides affect sensitive wildlife and plants? Miles of small roads will be constructed. That has the potential to create a serious weed problem in the area. Invasive plants pose a serious threat to both ecosystem functioning and desert tortoise population viability.

Comment ISEGS-6-19c: • EPA recommends the SDEIS consider alternatives to the proposed vegetation maintenance regime. The current proposal includes mowing to 12-18 inches to provide clearance for heliostat function. This would likely suppress vegetation through carbohydrate starvation, reducing its water use, and discouraging reproduction by seed. Mowing is likely to promote proliferation of non-native invasive weeds.

***Response**: BLM agrees that the site currently has a minor weed component and that the project has the potential to increase the introduction and spread of weeds. The agency carefully considered the threat of weeds to special-status plants and natural communities, and the wildfire risks associated with weeds. The analysis was included in the discussion of impacts to special-status plants and impacts to plant communities. The agency concluded that this was a significant indirect and cumulative effect, which led to the development of the draft Weed Management Plan (submitted August 2008), a thorough, detailed 80-page plan that includes: description of the weed management areas; monitoring and reporting methods; weed species descriptions and management strategies; standard operating procedures for herbicide treatment on BLM lands, a list of approved herbicides for use on public lands in California, and sample Pesticides Use Proposal forms and Application Records forms.*

*In response to comments, the agency has carefully reviewed the draft Weed Management Plan. In addition, the text of mitigation measure **BIO-13** has been revised to ensure that the weed management activities that occur are in conformance with BLM's Programmatic Environmental Impact Statement for Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States.*

Vegetation – Cumulative Impacts

Comment ISEGS-11-1c: The proposed ISEGS project and other proposed projects in the Ivanpah Valley, will cumulatively impact the viability of vegetation communities and rare plant populations.

Comment ISEGS-8-16c: Cumulative impacts to special status plants are recognized (Executive Summary, FSA/DEIS, p. 1-15) but the FSA/DEIS has failed to adequately analyze these cumulative impacts across the range of these species and ways to avoid and minimize these impacts.

Comment ISEGS-2-34c: With regards to the biological resources, the DEIS fails to accurately evaluate the cumulative impacts to rare species based from the projects proposed in the Ivanpah Valley or the CDCA. Because the scale of each of the different rare species' ranges vary, the cumulative impacts are not adequately analyzed. Cumulative impacts to special status plants are recognized (Executive Summary, FSA/DEIS, p. 1-15) but the FSA/DEIS has failed to adequately analyze these cumulative impacts across the range of these species and ways to avoid and minimize these impacts. For example, the analysis of the Mojave milkweed is much different than the cumulative impacts for the desert tortoise because the range of the Mojave milkweed within the CDCA is much more restricted than the desert tortoise. Cumulative impacts to the Mojave milkweed is likely to be much more substantial based on its limited range and the number of projects proposed within its range than the cumulative impacts to the badger, which is a more widely distributed species. Therefore, the DEIS fails to actually adequately analyze the cumulative impacts of the project on the various biological resources.

***Response:** BLM has worked with CEC, the applicant, and the intervenors to maximize avoidance of sensitive plant species to the extent practicable, and to maximize the effectiveness of transplanting for areas where avoidance is not practicable. These measures are intended to address the proposed project's contribution to cumulative impacts, as well as its direct impacts.*

Vegetation – Impacts from Development

Comment ISEGS-11-3: Significant populations of rare plants, including Sphaeralcea rusbyi var. eremicola (Rusby's desert mallow), a CNPS List 1B and BLM special-status plant, occur on the proposed project site, as described in the FSA/DEIS report.

The project will deploy heliostats, power towers, associated building structures, pipelines, and roads across approximately 4,000 acres of ecologically intact desert habitat, where naturally functioning ecological processes predominate over recent man-made intrusions. The completed project footprint will fragment 4,000 acres of diverse and intact desert plant communities. This includes rendering large rare plant populations, into fragments of various sizes. The biological affects of ecosystem fragmentation are well documented (Saunders et al., 1991). In general, the fragmentation of rare plant habitat on the project site will lead to two fundamental changes across the landscape; 1) an increasing isolation of remnant populations, and 2) a decrease in the total amount of available habitat for remnant populations. These two phenomena will be repeated throughout Ivanpah Valley, and where rare plants occur within the footprints of proposed neighboring energy projects, and the hundreds of thousands of acres of the Greater Mojave Desert ecosystem in California, Arizona, and Nevada where hundreds of utility-scale wind and solar project applications are being proposed.

To manage for viable rare plant populations on the project site, it will be necessary to identify Project related threats to those populations. Threats include, but are not limited to, altered light regimes due to shading by heliostats, altered hydrological conditions due to intercepted and redirected rainfall patterns and mirror washing, soil compaction during construction and operational phases of the project, altered soil nutrient conditions due to modified nutrient uptake by regularly mowed vegetation, and the introduction and spread of invasive weeds. With so many threats it is difficult to understand how they ultimately affect the viability of specific plant populations or metapopulations, how the threats themselves may interact, and how to come up with effective methods to alleviate them.

Comment ISEGS-7-19b: Impacts to rare plants on the project site would be extensive. To manage for viable rare plant populations on the project site, BLM must identify project-related threats to those populations. Threats include, but are not limited to, altered light regimes due to shading by heliostats, altered hydrological conditions due to intercepted and redirected rainfall patterns and mirror washing, soil compaction during construction and operational phases of the project, altered soil nutrient conditions due to modified nutrient uptake by regularly mowed vegetation, and the introduction and spread of invasive weeds.

Comment ISEGS-7-19c: Finally, we are very concerned about the extent of the impact of the proposed project on the Creosote Bush-White Bursage Barrel Cactus Community Type. With 10,000 acres of this plant community existing in 20 to 30 locations, the project appears to impact more than 1/3 of the community type (Application for Certification, page 5.2-46). Such an impact appears to be very significant and must be fully analyzed and addressed in the EIS.

Comment ISEGS-33-12a: There is some implication in the FSA that plants under heliostats will be trimmed, not removed (by grading or other means). If this is planned,

then the discussion should analyze the expected plant reaction to both trimming and continuous shading, including effects on photosynthesis, pollination and flowering, symbiotic insects, root growth, resistance to disease, shelter for other plant species that grow in the umbrella of creosotes, for instance, and perhaps other plant characteristics that a qualified biologist would consider to be of concern.

Comment ISEGS-11-7: The FSA/DEIS report directs the applicant to implement several measures under "BIO 18" that are generally in agreement with CNPS policies and guidelines on rare plant mitigation requirements (CNPS 1989, CNPS 1998a, CNPS 1998b). Additionally, BIO 18 measures would provide important information on the population dynamics and population viability of the project's six reported special status plant taxa, including Sphaeralcea rusbyi var. eremicola (Rusby's desert mallow), a CNPS List 1B and BLM specialstatus plant. This data could assist in the future management of these taxa both on the proposed ISEGS project and on other projects where they might occur.

The applicant proposes to intentionally manage the "quasi-natural" vegetation under heliostat fields as rare plant refugia by fencing individual plants or groups of plants under mirrors. Efforts to manage heliostat fields as areas for rare plant protection would be experimental in nature, meaning there is no current data that assures, or provides sufficient confidence, for success. Therefore, any management plan to this effect would need to be designed in such a way as to produce results that would better inform future decisions - whether the results are positive or negative; and it would need to have benchmarks for success and for remedial action to buffer against losses that could lead to extirpation or extinction of a species. In terms of rare plant conservation under solar mirrors, there is no foundation of success to point to, but many instances of species failing in response to ecosystem fragmentation, especially when management decisions focus on preserving a population's spatial distribution patterns at the expense of hindering a population's biological processes (Thrall et al., 2000). If the proposed project is built, the opportunity for rare plant conservation, ironically, will be in the knowledge we gain by documenting the loss of populations. For mitigation to occur, at a minimum the applicant must be required to conduct offsite surveys to identify lands with additional occurrences of the special status plants that are to be destroyed by the project, then place the lands where identified plants occur under conservation easement before being allowed to commence construction.

Comment ISEGS-7-19d: The sheer number and extent of the threats make them difficult to mitigate. However, the rare plant mitigation measure proposed in the FSA/DEIS – BIO-18 – is woefully inadequate. Although the proposed avoidance and minimization measures included inBIO-18 may reduce impacts to three impacted species (desert pincushion, nine-awned pappus grass, and Parish's clubcholla) to less-than-significant levels, impacts to Mojave milkweed and Rusby's desert-mallow would remain significant (FSA/DEIS, page 1-18). Impacts to these species therefore cannot be fully mitigated. In what appears to be a last ditch effort to mitigate for these species, BIO-18 requires the project owner to conduct floristic surveys for Rusby's desert-mallow and Mojave milkweed on all lands that will be acquired as part of the desert tortoise

compensatory mitigation requirements. (FSA/DEIS, page 6.2-128). However, compensatory mitigation for these species is not ultimately required, either on lands acquired for desert tortoise or elsewhere. As such, this survey requirement appears to be toothless. Adequate mitigation that addresses the impacts to rare plant populations would require, at a minimum, that the applicant conduct offsite surveys in multiple areas to identify lands with additional occurrences of the affected special status plants and protect those lands through acquisition or conservation easement.

***Response**: The EIS acknowledges that several construction and operational activities, including those mentioned in these comments, would impact plants. In the response to the identification of these impacts, BLM has worked with the CEC, the applicant, and the intervenors to identify measures to maximize avoidance, and to facilitate successful transplants where avoidance is not practicable.*

12.4 Biological Resources – Other Species

Birds

Comment ISEGS-1-7: Water-holding ponds or maintenance outwash basins for the power blocks are not well-described in the FSA/DEIS: "Two concrete-lined holding basins of about 40 feet by 60 feet are included in the power block area. They can serve for boiler commissioning and emergency outfalls from any of the processes" (From: CH2M Hill. 2008. Supplemental Data Response Set 2D. Revised Draft Biological Assessment, pdf at www.energy.ca.gov >>here). Are these still a part of the project design? Any standing open water may attract birds and other wildlife to the dangerous heated solar radiation between the heliostats and receivers. We recommend that any temporary water-holding ponds be covered with nets to exclude birds.

Comment ISEGS-7-20: The proposed project will reroute and fill in a number of existing ephemeral washes that flow into the Ivanpah Dry Lake. The EIS must analyze and address impacts to the Dry Lake and fairy shrimp. Additionally, the EIS must analyze and address impacts to migratory birds from this project. Loss of nesting and foraging habitat for special-status bird species (golden eagle, burrowing owl, loggerhead shrike, Crissal thrasher and Brewer's sparrow) would adversely affect populations of these species within the Ivanpah Valley. According to the FSA/DEIS proposed Condition of Certification BIO-17, the compensatory mitigation plan could offset the loss of habitat for these species and reduce the impact to less-than-significant levels. CDFG noted that this section should be updated to either show that the compensatory mitigation does offset the loss, or other measures may need to be developed that will reduce impacts to less-than-significant levels. Defenders agrees with CDFG's recommendation.

Comment ISEGS-7-19: The project fails to address impacts to the burrowing owl. In addition to its status as a State Species of Special Concern, the burrowing owl is also protected under Fish and Game Code Section 3503.5 and the Migratory Bird Treaty Act.

16 U.S.C. § 703. Impacts to burrowing owls must be addressed in the EIS. The species was detected on the ISEGS site during the 2008 surveys and suitable habitat was identified (FSA/DEIS, page 6.2-22). However, the FSA/DEIS did not identify compensatory mitigation measures for the burrowing owl. Off-site habitat acquisition and enhancement pursuant to BIO-17 is identified as a mitigation measure for the owl in Biological Resources Table 7 of the FSA/EIS. However, that habitat acquisition measure is not explained. BLM must adhere to the following measures in the EIS, as found in CDFG's Burrowing Owl Survey Protocol and Mitigation Guidelines:

a) Occupied burrows should not be disturbed during the nesting season (February 1 through August 31) unless a qualified biologist approved by the Department of Fish and Game determines that the adult birds have not begun egg-laying and the juveniles from the occupied burrows are foraging independently and capable of independent survival.

b) As compensation for the direct loss of burrowing owl nesting and foraging habitat, the project proponent should mitigate by permanently protecting known burrowing owl nesting and foraging habitat.

c) A Burrowing Owl Mitigation and Monitoring Plan should be submitted to the Department of Fish and Game for review and approval prior to relocation of owls describing the proposed relocation and monitoring plans. The plan shall include the number and location of occupied burrow sites and details on adjacent or nearby suitable habitat available to owls for relocation. If no suitable habitat is available nearby for relocation, details regarding the creation of artificial burrows (numbers, location, and type of burrows) will also need to be included in the plan.

Comment ISESG-1-38: All burrowing owls should be passively removed and not actively removed or excavated from their burrow. (Passive meaning wait for the owl to come out). Avoidance of owls and restructuring of the project site may be necessary. California Department of Fish and Game 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) will need to be implemented. The guidelines recommend that for offsite 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.

Comment ISEGS-1-39: The FSA/DEIS fails to mention several additional state and federal sensitive species that potentially occur on the site: CDFG Species of Special Concern: ....

The FSA/DEIS states that loss of nesting and foraging habitat for the special status bird species would adversely affect populations of these species within the Ivanpah Valley. The "compensatory mitigation plan could offset the loss of habitat for these species and reduce the impact to less-than-significant" (page 6.2-45). The needs of the dozens of

sensitive birds present may not be consistent with the needs of tortoise. A separate mitigation plan should be developed for sensitive bird species.

Another serious problem with this type of solar development, not present in parabolic trough plants, is the superheated beams reflected through the air over the heliostat fields onto the central receiver towers. Migrating or foraging birds have been burned to death flying through these beams.

The paper AVIAN MORTALITY AT A SOLAR ENERGY POWER PLANT, by Michael D. McCrary, Robert L. McKernan, Raplh W. Schreiber, William D. Wagner, and Terry C. Sciarrotta, Journal of Field Ornithology, 57(2): 135-141 (pdf >>here), found that Solar 1 during 40 weeks of study, caused 70 bird fatalities involving 26 species, most from collisions with both heliostats and tower, but thirteen (19%) birds (of 7 species) died from burning in the standby point. Heavily singed flight and contour feathers indicated that the birds burned to death. Six (46%) of these fatalities involved aerial foragers (swifts and swallows) which are apparently more susceptible to this form of mortality because of their feeding behavior. Will any water in ponds attract birds? Even if no ponds are present, birds in the area may fly through the project and be killed.

We have seen Gray vireos in Ivanpah Valley migrate low through creosote bush stands. These species could be significantly impacted by the solar field. Other rare nesting species on Clark Mountain could similarly be affected. How will the applicant mitigate impacts to raremigratory breeding birds on Clark Mountain?

Raptors potentially resident or migratory on the site that could beadversely impacted by towers…

A discussion of how negative affects of collisions and burning by towers during operation will be minimized and mitigated for raptors, migratory species, other birds, and bats flying during the day needs to be included in the FSA/DEIS.

Comment ISEGS-2-18: Golden eagles are documented to use proposed project site as a foraging (DEIS at 6.2-22) and are thought to nest in the adjacent Clark Mountains (DEIS at 6.2-23). The proposed mitigation measure BIO-17 proposes to reduce impacts to the species to less than significant levels, however the DEIS fails to present exactly how it will mitigate the loss of a substantial amount of foraging habitat for the golden eagle. The fact still remains that significant amounts of foraging habitat will decrease carrying capacity of the landscape and could result in a potential loss of habitat needed to support a nesting pair, which would impact reproductive capacity.

The DEIS fails to disclose the number of pairs of golden eagles that could be affected by the proposed project. Scientific literature on this subject is clear - the presence of humans detected by a raptor in its nesting or hunting habitat can be a significant habitat-altering disturbance even if the human is far from an active nest. Regardless of distance, a straight line view of disturbance affects raptors, and an effective approach to mitigate impacts of disturbance for golden eagles involves calculation of viewsheds

using a three dimensional GIS tool and development of buffers based on the modeling. The DEIS fails to discuss the potential impacts on nesting golden eagles in the Clark Mountains which is part of the Mojave National Preserve. Golden eagles use only a small subset of their home territories during nesting for foraging. These essential areas may include the proposed project site, however the DEIS does not analyze this important factor of nesting success. Additionally, the DEIS does not actually clearly analyze the impacts to and mitigations for the golden eagle under the Bald Eagle and Golden Eagle Protection Act, which prohibits, except under certain specified conditions, the take, possession, and commerce of such birds.

Comment ISEGS-2-17: As the DEIS notes, the proposed project area is rich in bird resources. Clark Mountain, which is directly adjacent to the site, is noted as an Important Bird Area. In fact, two very rare birds in California, the Whip-poor will (Arizona race) and the hepatic tanager are known to successfully nest on Clark Mountain. Birds migrate to Clark Mountain from the Colorado River Basin - a route that goes over the project site. The DEIS fails to evaluate the impact to this migratory pathway from the proposed project.

The DEIS recognizes the potential impact to diurnal birds from flying into the focused sun rays and getting burned (DEIS at pg. 6.2-65). However the DEIS fails to address the additional fatalities that have been documented to occur from birds running into mirrors. Adjacent to the proposed project site is the golf course, which includes several water features. This adjacent land use attracts migratory and resident birds based on the resources present - an oasis in the desert. The DEIS does not quantify the number of birds (rare, migratory or otherwise) that use/traverse the project site (for example a mean daily count), nor does it evaluate the impact to birds. McCrary estimated 1 .7 birds deaths per week on a 32 ha site with one 86 m tower. The proposed project site is approximately 1644 ha (over 50 times larger) with seven 95 m towers and five 140 m towers. Lacking baseline data of mean daily count of birds on the project site, analysis of the impacts to birds is impossible. Based on the existing literature, the impact may be significant.

Migratory birds were noted to occur on the proposed site (DEIS at pg. 6.2-15). Clearly the site is within a migratory pathway and the migratory elevation is a key issue that needs further analysis. Mirrors and towers within migratory elevations will create impacts to migratory birds. These impacts could be avoided or minimized if minors and towers are properly cited. NEPA requires that impacts be first avoided and minimized. These analyses needed to be done prior to the DEIS being produced and still need to be done, because detailed surveys and analyses are the basis for the evaluation of impacts to biological resources as required by NEPA. The failure to provide the baseline data on which to base impact assessment violates NEPA. Failure to be able to analyze impacts is not only a NEPA violation, but for migratory birds, may also lead to a violation of the Migratory Bird Treaty Act, 16 U.S.C. 703 -71 1, because migratory birds may be "taken" if the proposed project is constructed.

Additionally, some kind of "holding basins" will be present on site. See FSA/DEIS at 6.13-5. The DEIS indicates that project site would include 2 holding pods at each of the 3 power blocks -or 6 in total - 40 feet x 60 feet x 6 feet deep water "holding basins". Id. In contrast the Biological Assessment indicates that only two ponds will be constructed. Moreover, it is unclear if the holding basins are the same as the as the "evaporation pits" noted on Figure 5 in the project description (#15) in the DEIS. These may also be an attractive nuisance to birds as they migrate through the area, attracting them onto the project site during any time that the basins retain water. The DEIS is unclear about the amount of time water may be retained in these basins and no discussion of this infrastructure is identified in the biological section of the DEIS, nor are impacts analyzed or minimization measures identified. Examples of minimization could include requiring covered or contained infrastructure, which would not only eliminate bird (and other wildlife) attraction, but would reduce evaporation and therefore water use in this arid environment. Alternatively, the pools could be required to be emptied in a less than 24 hour period so they would not be an attractant to birds (including ravens).

Comment ISEGS-2-34d: As another example, migratory birds that frequent the Preserve, including raptors, may similarly be impacted by the project as well as other proposed projects in the area

***Response**: In response to these comments, BLM conducted additional analysis of impacts to bird and owl species in the SDEIS. This analysis is included in the FEIS.*

Bighorn Sheep

Comment ISEGS-2-14: The DEIS fails to comprehensively assess the impacts from of the proposed project on the local desert bighorn sheep population. Without this basic information about the use of the proposed project site and adjacent areas by bighorn it is impossible to assess the extent of the impacts to the bighorn population in this area from the proposed project.

The proposed project will clearly cause the loss of foraging habitat on alluvial fans and in washes which is known to be important to bighorn. Even if such habitat may only be used during certain seasons it can be critical to survival of bighorn. Without site-specific data on the details of habitat use patterns of the bighorn in the area, the DEIS cannot properly assess the importance of the alluvial fan and wash habitat to the bighorn population or the impact of its loss on the population.

The proposed project may affect foraging areas and movement corridors for bighorn, as well as fragmenting currently intact habitat. The DEIS proposes a wildlife drinker as a mitigation measure. However, the DEIS provides no information documenting the need for the proposed wildlife drinker. Is the lark range lacking in available water sources accessible to bighorn sheep? Moreover there is no discussion of how, if at all, this mitigation proposal could actually mitigate for the loss of forage and movement areas

and fragmentation of habitat by the construction of the proposed solar project on over 4,000 acres.

For other rare species addressed in the document the mitigation involves the purchase and future protection of an equal amount of acreage or more that is being impacted. No such suggestion is listed for bighorn, although even the purchase of lands elsewhere will do nothing for the movement corridor between the Clarks and the State Line Hills. The mitigation measure proposed does not relate to the loss of alluvial fan foraging habitat and movement corridor where the Project would be constructed.

Additional field study needs to be conducted by a knowledgeable researcher in the Clark Mountains and on the proposed solar site, and probably on the State Line range as well. Absent any real information in the field, any suggested mitigation or perceived impacts are pure conjecture.

We also note that similar concerns were raised in a letter dated October 27, 2009, where the California Department of Fish and Game provided some proposed minimization measures which were not included in the DEIS, Although these measures may not be sufficient to mitigate the impacts to a less than significant level, they could help minimize and reduce some of the impacts to bighorn and it is hard to understand why they were not discussed in the DEIS. The measures include "moving back the fence at the base of the mountain range, not using barbed wire fencing in this location, checking known big horn sheep springs data periodically to ensure the Project wells are not adversely impacting sheep watering locations, and ensuring invasive plants have not taken over the springs are valid minimization measures that should be evaluated."

Comment ISEGS-7-17: Defenders also urges BLM to assess impacts to Nelson's bighorn sheep, a BLM sensitive species, in the EIS. While the California Natural Diversity Database ("CNDDB") reports the last occurrence of bighorn sheep in this area to be in 1986, there is some evidence showing that bighorn sheep use the project area either as foraging habitat or for wildlife corridors. Therefore, we strongly urge that this project analyze and address impacts to bighorn sheep and their ability to move across the Ivanpah Valley. Construction and operation of the Ivanpah SEGS project could reduce foraging opportunities for bighorn on the bajada and narrow the width of movement corridors between Clark Mountain and the Stateline Hills for this species (FSA/DEIS, page 6.2-47). Furthermore, given the proposed use of groundwater, we strongly recommend that the impacts of this pumping be analyzed and addressed with respect to potential impacts on the desert seeps and springs used by bighorn sheep. Studies have not been completed to determine whether seeps used by bighorn in the Clark Mountains will be affected by groundwater pumping in Ivanpah Valley through hydrological connections. Lastly, the mitigation proposed in the FSA/DEIS is limited to construction of an artificial water source (page 6.2-47). This measure will not mitigate impacts to bighorn sheep foraging habitat and wildlife corridors and may have the negative effect of attracting ravens. Acceptable mitigation requirements are those that avoid, minimize, rectify, reduce or compensate for an impact. 40 C.F.R. § 1508.20. The artificial water source accomplishes none of these benefits in connection with the

potential habitat loss. The EIS should clarify the manner in which water sources will effectively mitigate for habitat loss and justify the absence of habitat acquisition requirements for bighorn sheep.

Comment ISEGS-8-11: The FSA/DEIS fails to fully analyze impacts to bighorn sheep, provide alternatives to avoid impacts, or provide measures to minimize these impacts. The suggested mitigation measure of adding an artificial water source in the Clark Mountain area will not mitigate for the loss of bajada foraging habitat. The FSA/DEIS also fails to identify and analyze the impacts associated with the construction and maintenance of this artificial water source such as facilitating raven presence in the North Ivanpah Valley. The BLM should consider removal of cattle from the Clark Mountain Allotment and locating the project elsewhere as mitigation and avoidance measures.

Comment ISEGS-1-42: There is a potential that bighorn sheep will use this site for winter foraging. How would development of the alluvial fan impact potential desert bighorn winter forage habitat? Bighorn will often cross alluvial fans and desert floors. How would construction of such a large facility impact connectivity of bighorn sheep populations and migration corridors? The FSA/DEIS fails to fully analyze impacts to bighorn, provide alternatives to avoid impacts, or provide measures to minimize impacts. For example, we do not believe building an artificial guzzler would mitigate for the potential loss of springs on the mountain slopes and bajadas due to groundwater pumping. How this mitigation will make up for the removal of bajada habitat used for feeding by bighorn sheep, as well as movement corridors between ranges. How will a guzzler offset loss of forage and habitat? A pre-construction baseline of bighorn sheep use should be established, followed by intensive monitoring during construction and follow-up post construction. We are not convinced that project water pumping will not have an adverse effect on the surrounding springs and seeps that are so precious to the resident wildlife population. Please analyze potential affects to Bighorn sheep springs.

Comment ISEGS-30-14: The proposed mitigation for the loss of desert bighorn sheep foraging habitat does not provide additional habitat for browsing. Providing water resources for desert bighorn does not mitigate the loss of food resources, particularly since the amount of available forage is the limiting factor for population size. NPCA agrees with multiple organizations that have stated that further study of desert bighorn migration corridors, lambing habitat, and seasonal requirements is necessary to determine the immediate and cumulative impacts to this population. The purchase and retirement of adjacent grazing allotments should be considered as mitigation if these leases are available for purchase.

Comment ISEGS-9-10: Page 6.2-25 asserts that "sheep inhabiting desert ecosystems can survive without consuming surface water." We note that proposed construction maps provided do not include existing springs, wells and seeps currently utilized by desert sheep species. A more appropriate level of mitigation would be to fund research addressing the critical resource needs to maintain the sheep population.

Comment ISEGS-2-34e: National Park land resources will also be cumulatively impacted. The Clark Mountains, part of the Mojave National Preserve, rise to almost 8,000 feet from the Ivanpah Valley and are home to bighorn sheep and other species that may be directly, indirectly, and cumulatively impacted by the proposed project and other proposed projects in the area.

***Response**: In response to these comments, BLM conducted additional analysis of impacts to bighorn sheep in the SDEIS. This analysis is included in the FEIS.*

Biological Soil Crusts

Comments ISEGS-1-45: Biological soil crusts are formed by living organisms and their by-products, creating a surface crust of soil particles bound together by organic materials. Crusts are predominantly composed of cyanobacteria , green and brown algae, mosses, and lichens. Liverworts, fungi, and bacteria can also be important components. Crusts contribute to a number of functions in the environment.

Because they are concentrated in the top 1 to 4 mm of soil, they primarily affect processes that occur at the land surface or soil-air interface. These include soil stability and erosion, atmospheric
nitrogen fixation, nutrient contributions to plants, soil-plant water relations, infiltration, seedling germination, C02 offsets and plant growth. Crust-forming cyanobacteria have filamentous growth forms that bind soil particles. These filaments exude sticky polysaccharide sheaths around their cells that aid in soil aggregation by cementing particles together. Fungi, both free living and as a part of lichens, contribute to soil stability by binding soil particles with hyphae. Lichens and mosses assist in soil stability by binding particles with rhizines/rhizoids, increasing resistance to wind and water action. The increased surface topography of some crusts, along with increased aggregate stability, further improves resistance to wind and water erosion. Crusts can alter water infiltration. Studies where crusts greatly increase surface roughness generally have increased infiltration with the presence of crusts. Where crusts do not significantly increase surface roughness, infiltration is generally reduced due to the presence of cyanobacterial filaments. Differences in findings are therefore site specific and also related to soil texture and chemical properties of the soil.

Comment ISEGS-1-5a: Daily driving by trucks will further compact the soils on this delicate desert habitat, and destroy fragile cryptobiotic crusts.

***Response**: The FEIS acknowledges that the cryptobiotic crusts would be damaged by project activities. FEIS text in Section 4.3 discusses the impacts of the construction of maintenance of the project site on cryptobiotic soil crusts and discusses mitigation measures to decrease the consequences of increased dust and other construction impacts.*

Deer

Comment ISEGS-1-43: Deer also occupy Clark Mountain, and we have seen deer traveling through lower-elevation fans and basin edges in creosote-Mojave yucca habitat elsewhere in the Mojave Desert. Please analyze impacts to Mule deer foraging habitat, watering areas, and movement corridors by the project.

***Response**: In response to these comments, BLM conducted additional analysis of impacts to deer in the SDEIS. This analysis is included in the FEIS.*

Gila Monsters

Comment ISEGS-1-37: The FSA/DEIS states that the "compensatory mitigation plan, could offset the loss of habitat for this species and reduce the impact to less-than-significant" (page 6.2-47). The needs of the Gila monster may not be consistent with the needs of the tortoise. A separate mitigation plan should be developed for Gila monster, with separate mitigation land acquired if needed. The California Department of Fish and Game agreed that compensatory mitigation for Desert tortoise used to offset impacts to Gila monsters is inadequate. The Gila monster is a fossorial species that is very difficult to locate. The FSA/DEIS does not explain what kind of surveys were used to look for the species.

The BLM and CEC need to have qualified individuals do more complete surveys of the area for the species before any conclusions are made about population numbers. Populations of this species in the Mojave Desert are fringe populations and could carry unique genetic bottleneck traits that should be researched.

Comment ISEGS-7-16: Defenders strongly urges BLM to include the Banded Gila Monster, listed under CESA as a species of special concern by CDFG, on the list of species to be analyzed and addressed. Recent scientific research has found that Gila monsters appear to use rocky hills and surrounding bajadas as overwintering sites (D.F. DeNardo, et al., 2007 Desert Tortoise Council Symposium Abstract). Thus, the project area could be important habitat for the Gila monster. The project should provide adequate mitigation for impacts to Banded Gila Monster habitat. The FSA/DEIS states that compensatory mitigation for desert tortoise may also offset impacts to Gila monsters. This mitigation measure may not have a tangible benefit for the species on the ground and is therefore inadequate. As CDFG stated in its comments, there must be a plan in place to address impacts to Gila monster should desert tortoise mitigation be insufficient to reduce Gila monster impacts to less than significant levels (CDFG comments on the Preliminary Staff Assessment, October 27, 2009, page 4).

Comment ISEGS-2-19: Mitigation measure "Bio-11" for the banded Gila monster proposes relocation as the mitigation strategy if the lizard is encountered. Relocation of banded Gila monster has been shown to be an ineffective strategy. Similar to desert tortoises, the Gila monsters try to return to their original sites despite relocation

distances. Effective mitigation for this species needs to include strategies that will minimize mortality, not ensure it.

Comment ISEGS-2-11e: The baseline descriptions in the DEIS are similarly inadequate for other species including birds, bighorn sheep, and late-summer and fall blooming plants. Indeed, the fact that there are significant late-summer and fall rains is almost completely absent from the document. But see FSA/DEIS at 6.2-27 (discussing gila monster activity after summer rains).

***Response**: In response to these comments, BLM conducted additional analysis of impacts to gila monsters in the SDEIS. This analysis is included in the FEIS.*

Bats

Comment ISEGS-1-41: The FSA/DEIS mentions only three sensitive bat species that may occur in the area: Townsend's big-eared bat (Corynorhinus townsendii), Pallid bat (Antrozous pallidus), and Long-legged myotis (Myotis volans). Many other sensitive bat species potentially occur at the site, that are not discussed…

An assessment of project impacts on these species should be done, with a discussion of whether any additional species specific mitigation will be implemented to offset project impacts. The FSA/DEIS says that to minimize risk of avian collisions with the heliostat towers, only flashing or strobe lights shall be installed on these towers. Lower facilities will also have lights that may attract bats. The FSA/DEIS does not discuss affects of night lighting on bats in the area. Insect swarms attracted to lights may lead to bat collisions. Monitoring of impacts to bats, including mortality found on-site, should be discussed with reduction of artificial lighting proposed as a potential.

***Response**: In response to these comments, BLM conducted additional analysis of impacts to bats in the SDEIS. This analysis is included in the FEIS.*

Insects

Comment ISEGS-2-21: No scientific literature is available that quantitatively documents the impact of concentrated solar facilities on insects. However, information from a biological surveyor on the Daggett Solar 1 site indicates that diurnal insects including butterflies were impacted from the focused sunlight. The DEIS completely fails to identify or address this important issue. The DEIS does note that many of the sensitive bird species are insectivores and rely on ample amounts of insects in their diet. Additionally, many of the resident and adjacent plant species including rare plants rely on insects for pollination. Clearly the impacts to insects will need to be analyzed in the recirculated DEIS including the effects on the secondary consumers (birds) and plants.

Based on the plants identified on site and research and consultation with an entomologist familiar with desert insects, rare insect species could occur on site. Over twenty rare butterflies have host plants that occur on site including species of metalmarks, marble butterflies, skippers and small blue butterflies. Additionally the desert swallowtail (Papilio polyxenes coloro) and the Pahaska Skipper (Hesperia pahaska martini) have been documented in the general site vicinity. No surveys were done to evaluate the insects that occur on site and the no analysis of impacts to those species of eliminating over 4,000 acres of habitat is provided. No analysis was done on the operation of the solar plant and its effects on the adjacent and migratory insects, some of which may be essential pollinators for the rare plants on and off the project site. Foreseeable impacts include attraction of the species to the mirrors and focusing beams, and subsequent insect collisions and incineration.

***Response**: The FEIS indicates that insects, like birds, may be subject to heat impacts from focused light beams. Loss and alteration of habitat could result in the loss of individuals and depress local populations of insects, but is unlikely to adversely affect populations at regional level due to high reproductive rates, immigration from surrounding areas, and the relative amount of habitat lost in comparison to the amount of habitat in the region.*

Badgers

Comment ISEGS-2-20: Badgers were identified in the project area during surveys in 2007 (DEIS at pg. 6.2-45). Literature on the highly territorial badger indicates that badger home territories range froin 340 to 1,230 hectares. Therefore, the proposed project could displace at least one badger territory. While surveys prior to construction are clearly essential since badgers have been located on the site, relocation of badgers into suitable habitat may result "take". Relocation is likely to move relocated badgers into existing badger's territory. Studies need to be provided on both on- and off-site badger territories if animals are to be relocated in order to increase chances of persistence. At a minimum, the EIS should identify suitable habitat.

Comment ISEGS-1-40: The FSA/DEIS states that the project would induce a large loss of Badger habitat and population within Ivanpah Valley. The "compensatory mitigation plan could offset the loss of habitat for this species and reduce the impact to less-than significant" (page 6.2-46). The needs of the Badger may not be consistent with the needs of the tortoise. A separate mitigation plan should be developed for the Badger. No minimization plans are discussed.

The applicant plans to conduct Badger surveys during the desert tortoise clearance survey. If tracks are observed, the applicant would develop and implement a trapping and relocation plan. This plan should be developed now, for public review.

***Response**: In response to these comments, BLM conducted additional analysis of impacts to badgers in the SDEIS. This analysis is included in the FEIS.*

General Wildlife Movement/Connectivity

Comment ISEGS-6-20: The SDEIS should indicate what measures will be taken to protect important wildlife habitat areas from potential adverse effects of proposed Project. We encourage habitat conservation alternatives that avoid and protect high value habitat and create or preserve linkages between habitat areas to better conserve the covered species. The DEIS indicates that "CDFG has noted that wildlife corridors are present through and adjacent to the ISEGS site, and have expressed concern that the project could adversely affect bighorn sheep" (at pg. 6.2-26). The SDEIS should address wildlife movement impacts associated with the proposal, and present mitigating measures to maintain wildlife movement at specific locations in the vicinity of the Project site, especially where wildlife movement already occurs.

Recommendations:

- Incorporate goals and objectives developed for the California Missing Linkages Report and the California Essential Habitat Connectivity Project and identify how Project alternatives have been designed to allow for continued wildlife movement:
- Use data developed for the statewide California Wildlife Action Plan and the Nevada Wildlife Action Plan to inform proposed wildlife crossings and mitigation. Identify in the SDEIS the specific design changes proposed to avoid resources. Both wildlife action plans address at-risk species and provides range maps.

Comment ISEGS-30-10: Impacts to wildlife movement and migration corridors. What are the impacts to mammals, birds, and insects that travel between the ISEGS site and the Mojave National Preserve? The DEIS does not consider the impacts on species, such as passerines, raptors, desert bighorn sheep, mountain lion, bobcat, coyote, or gray fox that utilize large home ranges that may include both the project site, and the Mojave National Preserve. The DEIS does not identify whether the ISEGS project will modify, or destroy existing travel or migration corridors for species. The DEIS does not discuss the usage or importance of the project site on annual or seasonal migrations. The DEIS does not address whether the alteration or destruction of migration corridors will trigger mitigation. NPCA requests that this analysis be conducted and included in the EIS, with recommendations for appropriate mitigation, if the impacts can be mitigated. If they cannot be mitigated, the siting of the ISEGS should be questioned in the context of this analysis.

Comment ISEGS-24-1: Impacts to wildlife movement and migration corridors. What are the impacts to mammals, birds, and insects that travel between the ISEGS site and the Mojave National Preserve? The DEIS does not consider the impacts on species, such as passerines, raptors, desert bighorn sheep, mountain lion, bobcat, coyote, or gray fox that utilize large home ranges that may include both the project site, and the Mojave National Preserve. The DEIS does not identify whether the ISEGS project will modify, or destroy existing travel or migration corridors for species. The DEIS does not

discuss the usage or importance of the project site on annual or seasonal migrations. The DEIS does not address whether the alteration or destruction of migration corridors will trigger mitigation. NPCA requests that this analysis be conducted and included in the EIS, with recommendations for appropriate mitigation, if the impacts can be mitigated. If they cannot be mitigated, the siting of the ISEGS should be questioned in the context of this analysis.

***Response**: The analysis of impacts to specific species in the FEIS includes consideration of the impact of the proposed project and alternatives on habitat connectivity.*

13 CLOSURE, REVEGETATION, AND REHABILITATION PLAN

Comment ISEGS-1-8: Within the heliostat fields, 10-foot wide maintenance roads would be established concentrically around the power blocks to provide access for heliostat washing and maintenance. The roads would be established between every other row of heliostats. The applicant estimates that 100 heliostats can be washed per hour with 4 trucks working 10 hours per night at about 0.4 mile per hour. 158,285 linear feet of new heliostat maintenance would be graded into creosote bursage cactus- yucca desert (page 6.2-61). An additional maintenance road would be established on the inside perimeter of the boundary fence. Within each unit, a diagonal dirt road would be established to provide access to the concentric maintenance paths and the power blocks. Some of these would be gravel. How will all these new roads be restored? Will the area become an off-roading area after the power plant is decommissioned?

Comment ISEGS-1-5b: How will BLM insure that the site can be adequately restored after 50 years of industrial use?

Comment ISEGS-33-11: Page 6.2-35 indicates that the applicant had not provided staff with acceptable reclamation plans in time for inclusion in the FSA.

A reclamation plan must include description of fugitive dust control after closure. All machinery will be removed, leave bare ground which will not be revegetated for a very long time. How will dust be controlled?

Comment ISEGS-2-24: Revegetation criteria are essential as a method for assessing success of revegetation efforts. The revegetation criteria (Table 7-6 at pg. 7-32 of the Closure, Revegetation and Rehabilitation Plan) are a good start to assessing the success of the proposed revegetation effort. One important absent component is the annual flora. Admittedly tricky to monitor but essential to the landscape level integrity of the revegetated area, revegetation criteria need to be developed and included for the annual flora, based on trends in the cover and diversity of species over the 10 year monitoring period.

Because the actual proposed project site data revealed an elevational cline in shrub cover, density and richness (greater cover, density and richness at higher elevations than lower), the revegetation criteria needs to also reflect that elevational effect. Clarifications should also be made in the revegetation criteria to preclude future interpretations that the percent cover is the total cover of the perennial species on the ground (as opposed to a percent of the original cover) and the same concept must be clarified with the species diversity and richness.

At a minimum, all of the issues in Biological Resources Appendix B (FSA/DEIS at pg. 6.2-150- 6.2-164), should be incorporated into the final Closure, Revegetation and Rehabilitation Plan to help insure a more successful revegetation effort.

Comment ISEGS-2-23: Desert lands are notoriously hard to revegetate or rehabilitate and revegetation never supports the same diversity that originally occurred in the plant community prior to disturbance. The task of revegetating over six square miles will be a Herculean effort that 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 project will cause permanent impacts to the on-site plant communities and habitat for wildlife despite "revegetation", because the agency's regulations based on the Northern and Eastern Mojave Plan's rehabilitation strategies only requires 40% of the original density of the "dominant" perennials, only 30% of the original cover. Dominant perennials are further defined as "any combination of perennial plants that originally accounted cumulatively for at least 80 percent of relative density". These requirements fail to truly "revegetate" the plant communities to their former diversity and cover even over the long term. The Closure Rehabilitation and Recovery Plan revegetation criteria are even less robust, requiring after 10 years only 12% cover, 0.40 diversity and 10 species richness. Neither the agency's or project revegetation criteria require native annual species as a component of revegetation, despite the fact that native wildlife rely heavily on spring and fall annuals for survival. For all these reasons, permanent impacts will occur to the site despite revegetation.

The plant species list for the project site shows much greater diversity than the twelve species identified as Seeds Targeted for Collection in Support of Revegetation. The list needs to be greatly increased to capture the original diversity of both perennial and annual species. Enabling an accelerated successional process is appropriate and desirable, however, the plan should not rely on dispersal of late successional propagules over the six square mile area, but should instead include sequential seeding, where later successional species are introduced by seed after early successional species establishment. This strategy would encourage quicker reestablishment of late successional species throughout the site.

Comment ISEGS-1-12: In decommissioning, concrete, piping, and other materials existing below three feet in depth would be left in place. We request the applicant remove these materials.

Response: *As part of the development of the FEIS, BLM has continued to work with the applicant to provide more specificity, establish quantitative standards for success, and otherwise improve the Draft Closure Plan. Revision 3 to the Closure Plan was submitted on July 8, 2010. The revisions associated with the FEIS have included updated information regarding the Closure Plan and its requirements.*

Comment ISEGS-9-11: Page 6.2-40 suggests that transplantation of plant species will not be effective. NPS is aware of a successful plant transplantation project associated with the Viceroy Mine in the Castle Mountains on BLM managed lands We recommend that the DEIS be revised to analyze whether the loss of habitat and translocation of plant and wildlife species would impact the number or survivability of those same species in nearby Mojave National Preserve. Wildlife species that migrate between the Preserve and the project area, or that are interdependent on the resources of the two areas may be adversely impacted. The current analysis appears to limit its scope to the specific project area.

Response: *In working with the applicant to develop a revegetation plan that has the highest possible opportunity for success, BLM has evaluated and considered a large volume of data from academic and project-specific sources, including the Viceroy Mine information.*

Comment ISEGS-7-13: The Biological Assessment for this project lists the Site Rehabilitation Plan as a mitigation measure (Biological Assessment, page 1-21). The proponent has developed a plan for restoring the site after the 50-year lifetime of the facility. As stated in the Application for Certification (page 5.2- 29), "desert systems are ecologically fragile and it will not be practicable to recreate the lost habitat elements exactly after 50 years of site disturbance…the long-term lapse, more than 50 years, is equivalent to a total loss of this habitat." The identification of site rehabilitation as a mitigation measure is improper. The proponent concedes in its own Application for Certification that the site cannot be rehabilitated to its original state. The site will represent a total loss in terms of its habitat value. The severity of the impacts to the species merits acquisition of habitat as the most feasible mitigation measure. The desert tortoise is known to be present on the site, the habitat is of high quality, and the habitat would be significantly disturbed by the project due to grading and ground disturbance. Additionally, the project affects habitat connectivity because it bifurcates an area located at the juncture of the Mojave Preserve, the Tortoise DWMAs and Federal wilderness areas.

Response: *Site rehabilitation is only one component of a package of mitigation measures proposed to address long-term impacts to habitat. The EIS acknowledges*

that habitat impacts will be long-term, and also includes acquisition of habitat, as recommended by the comment.

14.0 CULTURAL RESOURCES AND NATIVE GROUP COORDINATION

Comment ISEGS-1-35: What are the concerns of local tribes? The applicant and BLM did a poor job of contacting local tribes, and did not contact others, such as the Shoshone, who also have interests in Ivanpah Valley as part of their homeland. We would like a detailed description of all local Native American Tribal concerns written in the EIS.

The proposed project site lies within the homeland of the Chemehuevi. While the DEIS states that cultural sites are insignificant on the project site, we are requesting that BLM organize a site visit with elders of the Chemehuevi tribe. We would also like to request that BLM consider having the applicant submit a new plan that adequately avoids significant cultural resource sites. The Chemehuevi have expressed concern to BLM over the Ivanpah Solar Electric Generating System. While BLM has claimed that they sent all the relevant information to The Chemehuevi, the Chemehuevi are displeased because they have not been consulted on this project. That is not acceptable. An open line of communication will have to be maintained with the tribes who hold a special interest on this land.

The project area has other tribes that have a cultural history in the area as well. BLM and the applicant should contact them as well and organize site visits.

Comment ISEGS-2-37: The Center is informed and believes and based thereon alleges that several Native American tribes with interests in this area have not been properly notified of the proposed project concerning the impacts to cultural resources and Native American values. This is far more than a "procedural" issue; it is also a substantive failing by BLM that undermines the NEPA analysis.

Most importantly, without input from the affected tribes with interests in this area it is impossible to know if all of the issues regarding impacts to cultural resources and Native American values have been adequately identified or addressed. When BLM revises the DEIS as it must for many reasons, it should also reach out to the affected tribes and ensure full participation from them on the potential impacts to cultural resources and Native American values from the proposed project.

***Response**: See the Native American Consultation subsection of the Cultural Resources section (Page 4-12.32 of the DEIS), and Table 6 and Table 7 in the Cultural Resources section of the EIS. These sections provide the consultation information requested in the comments. This information has been updated in the FEIS, to include the additional government-to-government consultation that has occurred subsequent to the publication of the DEIS.*

No concerns were expressed by any of the Tribes consulted. Although information was requested, no sites of traditional or religious use were identified in the area by the Tribes. One Tribal elder from Fort Mojave did note that 'Ivanpah' meant 'good water' in Chemehuevi. The project is within the homeland of the Chemehuevi. The Timbisha Shoshone Tribe was added to the consultation/coordination list in November 2009, at their request. Numerous letters as well as phone calls and face to face meetings occurred with Tribes on this project:

Letters submitted:

Letter #1: October 4, 2007 or December 6, 2007 (for Tribes on NAHC list [*], not on BLM list) and December 2, 2009 for the Timbisha Shoshone

Initiating coordination/consultation with results of archaeological survey

Letter #2: March 5, 2009

Follow-up and results of additional survey

Letter #3: December 16, 2009

Submitting Draft EIS

Letter #4: April 16, 2010

Submitting Supplemental Draft EIS

The Needles Field Office (NFO) Manager and archaeologist had short face-to-face meetings with both Chairman Arnold (Pahrump) and Cara (Chemehuevi Cultural) about ISEGS at an OHV conference at Chemehuevi Reservation, but no concerns were expressed. BLM was contacted by Phillip Smith (Fort Mojave Indian Tribe) on October 21, 2009. The only specific comments he gave were that the Chemehuevi used to live in and use the mountains surrounding the Ivanpah Valley for hunting and collecting, that a spring was named "Ivanpah" meaning 'good water' in Chemehuevi (not near the project area) and that he wanted to be included on future mailings.

There was a contact via phone on 4 May 2010, with Chairman John Valenzuela, San Fernando Band of Mission Indians. He wanted to know if the project lands had been surveyed and if any prehistoric or Tribal sites had been found. BLM assured him that only historic period sites had been identified to date and that BLM would let him know if any were identified. His concern was that prehistoric sites indicating tribal activity might be destroyed.

Chemehuevi Indian Tribe
Colorado River Indian Tribes
Fort Mojave Indian Tribe

Las Vegas Paiute Tribe
Pahrump Paiute Tribe
**Cahuilla Band of Indians*
**Morongo Band of Mission Indians*
**Ramona Band of Mission Indians*
**San Fernando Band of Mission Indians*
**San Manuel Band of Mission Indians*
**Serrano Nation of Indians*
Timbisha Shoshone Tribe

The only site eligible for inclusion on the National Register of Historic Places that will be affected is the transmission line. No prehistoric sites were identified in the project footprint.

Comment ISEGS-1-34: During geoarchaeological studies observers found patches of very stable old bajada, bypassed by flood washes and ground disturbance. "A subfossil piñon log (Pinus monophylla) was found on a more recent bajada surface among recently active ephemeral streams. The log is thought to be anywhere from 1,100–3,400 years old and may date the surface on which it was found to that approximate age. This information and the recent inadvertent discovery of an intact historical archaeological site (Temporary field no. ISEGS-02) approximately 1,700 feet to the east of Ivanpah No. 2... demonstrates that, although the bajada is subject to a geomorphic regime of net erosion, the landform provides enough stable surface patches to preserve a representative sample of the historical archaeological deposits that would reflect historic activity on the bajada" (page 6.3-40 on our hard copy of the FSA/DEIS, and page 4.12-42 on the digital cd version).

This is "old growth Mojave Desert scrub" and we found ancient creosote rings also indicating stable land surfaces. These creosote grow clonally outwards in a ring, and may be thousands of years old. These areas may hold cultural features and artifacts and should be thoroughly surveyed before scraping.

We have found at least one old trail running east-west through the middle of the project. This should be preserved and avoided, as it may be an important prehistoric trail, and may connect Clark Mountain with the geoglyph on the small hill, and other areas.

A strange "enigmatic" geoglyph (ISEGS-01) was found next to the metamorphic hill on a small hill next to the middle of the project site (page 6.3-50 hard copy). If a large industrial development is built so close to this eoglyph, it may be vandalized. Therefore the No Action alternative should be considered, as this area may have important cultural values.

What will happen to cultural sites found on the site? Will they be collected and archived or simply destroyed? We request that the applicant be required to document, and avoid all artifacts and features.

The FSA/DEIS admits: "Construction of the solar and wind projects proposed throughout this region would result in substantial changes in the setting and feeling, and association of the areas in which they are constructed. The current design of these projects would result in a significant cumulative impact to the region. Within the desert region there are numerous traditional use areas, and lands sacred to Native Americans are present. Potential impacts would include physical disturbance or alteration directly as a result of construction activity or diminished visual character of traditional use areas due to the presence of industrial structures. If impacts to traditional use areas would occur at any individual site, mitigation would be implemented to minimize project impacts; however the potential for vast disturbance of the desert would potentially lead to a loss of resources and impacts to visual character, thereby resulting in a significant cumulative impact. (page 4.12-72 in the digital version, page 6.3-71 hard copy). The No Action alternative should be taken so as not to disturb this area and lead to cumulative impacts.

Just because large numbers of lithics have not been found on the fan does not mean it is not a significant cultural area, as people may have used it commonly to hunt lizards and rabbits, collect Lycium berries, which grow commonly on the project site, and other uses which do not preserve well in the archaeological record.

***Response**: No prehistoric sites were identified within the project footprint. Only one site within the project boundary (the Hoover Dam-to-San Bernardino transmission line, CA-SBR-10315H) has been determined eligible for inclusion on the National Register of Historic Places. The impacts to this important resource will be mitigated. Sites that have been determined not eligible do not require mitigation.*

15.0 FIRE, SAFETY AND HAZARDOUS MATERIALS

Comment ISEGS-27-2: County Fire respectfully disagrees with CEC Staff's conclusion that hazardous materials impacts would pose no significant threat. It appears that not all State requirements were thoroughly researched and reviewed prior to resultant conclusions. Although the document references the Federal Spill Prevention Containment and Countermeasures Plan, there is no reference to the State Above-Ground Petroleum Storage Act. Conclusions regarding air modeling need further study, particularly with regard to aqueous ammonia and sulfuric acid. Further, there is not enough information to determine if a Risk Management Plan is required for the aqueous ammonia as per the California Health and Safety Code. Appendix A is lacking supporting documentation for several of the chemicals that are referenced in the EIS. Further study on these and other issues are necessary before conclusions can be drawn.

Additionally, the DEIS is lacking any references at all regarding the proper management of routinely generated hazardous wastes, either from a Federal or a State perspective. This needs to be addressed before conclusions can be drawn.

***Response**: The comment has been reviewed, and the FEIS text has undergone revision to add the reference to the State Above-Ground Petroleum Storage Act. No information on aqueous ammonia has been added, as the facility will not use aqueous ammonia. Information on the sulfuric acid to be used was already present in the Hazardous Materials Management section of the DEIS. Information on hazardous wastes was presented in the Waste Management section of the DEIS.*

Comment ISEGS-2-25: Fire in desert ecosystems is well documented to cause catastrophic landscape scale changes and impacts to the local species. While the DEIS mentions the impacts of fire via the proliferation of nonnative weeds (DEIS at pg. 6.2-34 and pg. 6.2-63), it fails to adequately analyze the impacts of this issue on adjacent natural desert habitat especially in light of the fact that the proposed project relies on superheated liquids.

The DEIS fails to adequately analyze the impact that an escaped on-site-started fire could have on the natural lands adjacent to the project site if it escaped from the site. The DEIS also fails to address the mitigation of this potential impact. Instead it defers it to the Worker Environmental Awareness Program (WEAP) and only requires "a discussion of fire prevention measures to be implemented by workers during project activities" (DEIS at pg. 6.2-102). A fire prevention and protection plan needs to be developed and required to preclude the escape of fire onto the adjacent landscape (avoidance), lay out clear guidelines for protocols if the fire does spread to adjacent wildlands (minimization) and a revegetation plan if fire does occur on adjacent lands originating from the project site (mitigation) or caused by any activities associated with construction or operation of the site even if the fire originates off of the project site.

Comment ISEGS-30-7: Potential for the ISEGS or its associated transmission to create a fire hazard on site, or on adjacent lands.

Comment ISEGS-1-24: A fire protection system would be designed to protect personnel and limit property loss and plant downtime in the event of a fire. The primary source of fire protection water would be the 250,000 gallon raw water storage tank to be located in each power block. Approximately 100,000 gallons would be usable for plant process needs and 150,000 gallons would be reserved for fire protection. All fire protection systems would be focused on the power blocks, administration/warehouse building, and other areas of active operations. The project would not include any specific facilities to address potential wild fires. This would put the burden on the counties. How will the applicant address wildfires and increased costs to the county of fire-fighting?

Comment ISEGS- 27-5: The County Fire Department respectfully disagrees with CEC Staff's conclusion that the proposed project will not have impacts on local fire protection services. Review by the County Fire Department indicates that the fire risks at the proposed facility would pose significant added demands on local fire protection

services. Service areas for existing stations are currently far in excess of reasonable demands and are frequently stretched far beyond their capacity. The County Fire Department further disagrees with Staff's conclusion that response times and staffing are adequate for this project. Under perfect conditions, the closest station is barely inside the "golden hour" for successful trauma response and recovery. Routine responses to average weekend traffic incidents can completely deplete staff and resources. Also, inclusion of references to mutual aid with Nevada jurisdictions fails to recognize that mutual aid is voluntary and not compulsory. Further study on these items is necessary. In addition, it would be appropriate for Staff to further investigate Emergency Medical Service impacts that will arise from over 1,000 employees, particularly since Advance Life Support Services (ALS) is just within an hour travel time under perfect conditions regardless of the precautions and conditions taken on-site.

Comment ISEGS-27-6: Financial impacts to fire protection services need further study. Although financial issues may not be a direct environmental impact, if the fire service does not have the financial support for staffing, equipment and facilities to respond to fire, hazmat and other emergencies at the project, then incidents on-site could predictably result in both onsite and even off-site environmental degradation.

***Response**: The potential for facility construction and operations to cause wildfires was addressed on Pages 6.14-11 to 6.14-13 of the DEIS. The potential for transmission lines to cause fires was evaluated on Page 6.11-7 of the DEIS.*

16.0 GEOLOGY/PALEONTOLOGY/MINERALS

Comment ISEGS-27-7: The Ivanpah Fault and Stateline Fault are mentioned but do not seem to be analyzed in sufficient detail as we do not find full discussion of whether (and how) they may be hydrogeological features that may influence groundwater recharge and drawdown models. Further, these faults may be a seismic source as some recent literature suggests, a reference to which we forwarded to your office in our October 15, 2009 letter to Chris Dennis. The seismic safety of the power plant and towers directly relates to worker safety at the facility.

***Response**: Information on the relationship between the faults and groundwater has been added to Section 4.16 of the FEIS. The potential for the faults to create a worker safety hazard was analyzed in detail in the DEIS (see Pages 6.15-12 to 6.15-15).*

17.0 GRAZING

Comment ISEGS-2-4b: As another example of the BLM's failure to adequately address multiple use principles, the proposed site is within an existing grazing allotment lease and the FSA/DEIS states that "Approval of the project would require a modification of the grazing lease, by reducing the total active AUMs as calculated from past range adjudication methods." FSA/DEIS at 6.16-4. First, the FSA/DEIS appears to be using the wrong baseline AUMs for this allotment. The NEMO plan clearly states that

the Clark Mountain allotment includes 97,560 acres of public lands and 1,303 AUMs (NEMO Plan at 3-29, Table 3.5), in contrast the FSA/DEIS states that "There are currently 1,428 AUMs leased on the entire Clark Mountain Allotment." FSA/DEIS at 6.16-1. Second, BLM estimates that the proposed project would require modification of the grazing lease to eliminate 70 AUM on the lands that would be removed from multiple use for the proposed project and proposes only this "temporary" reduction in grazing for the life of the project (which is expected to be 50 years), but does not propose to retire grazing from this area, and rather assumes that cattle will return "[following the achievement of the objectives for rehabilitation" FSA/DEIS at 6.16-5. This statement completely ignores the need to provide NEPA analysis for the renewal of grazing allotments and simply assumes that even after 50 years the best use of the reclaimed site will be for grazing. More importantly, a 50-year reduction in grazing cannot truly be considered "temporary."

Comment ISEGS-9-16: Livestock Grazing, Page 6.16-4 - This section of the document lacks discussion of impacts from potential livestock displacement within the Clark Mountain Grazing Allotment. The Allotment is shared between the NPS and Bureau of Land Management with the majority of AUMs on BLM managed lands. We recommend that this section of the document address project impacts on grazing and possible herd migration to relatively undisturbed desert habitat. We recommend that it also address whether the allotment will be reduced by the number of displaced livestock.

***Response**: The text in the FEIS has been modified to provide the additional clarification requested by the comments.*

18.0 LAND USE

Comment ISEGS-27-1b: In San Bernardino County, 12,000 acres represents a full 12% of the 140,000 acres of potential desert tortoise habitat held in private unincorporated lands under County jurisdiction. This limits future development by setting aside 12% of the possible desert tortoise habitat on private lands. That represents a significant loss of developable land and economic potential, just on a project basis. Considered on a cumulative scale, looking at Table 5: Regional Renewable Energy Projects, fully one million acres may be occupied with renewable energy projects. At a 3:1 ratio, these would require another 3 million acres, for a total of 4 million acres for just these few projects and their mitigation lands. As a reference, there are 3 million acres of San Bernardino County private unincorporated lands in the West Mojave Plan area. The cumulative analysis does not add up the mitigation lands for the foreseeable projects.

***Response**: This agency acknowledges that the mitigation, if it takes the form described in the comment, may result in some impact on County tax base. However, it is difficult to quantify based on several uncertainties, including the likely location of some portion of the compensation lands outside of San Bernardino County; the likelihood that some portion of the compensation would be in the form of habitat enhancements projects,*

rather than direct land acquisition; and the uncertainty on what proportion of the existing applications will eventually be actually developed.

Comment ISEGS-1-13: BLM admits that the project would not conform with San Bernardino County's General Plan Conservation and Open Space Elements. How will this be mitigated?

***Response**: The FEIS has been revised to modify the conclusion regarding the non-conformity with the San Bernardino County General Plan. The San Bernardino County General Plan includes a statement to the effect that it is not applicable on public lands. Therefore, the project is not out of conformance with the Plan.*

Comment ISEGS-2-4c: The proposed project is a high intensity, single use of resources that will displace all other uses and that will significantly diminish (indeed, completely destroy) of over 4,000 acres of high-quality occupied desert tortoise habitat among other impacts. On this basis as well as others the proposed project is inappropriate for a Limited Use area such as this one and the terms of the proposed plan amendment are inconsistent with the CDCA Plan.

Although solar development is a potentially allowable use in this area, the BLM must take into account all of the relevant multiple uses of the area that could be displaced before making a decision including, for example, the displacement of desert tortoises, destruction and fragmentation of high quality habitat, destruction of sensitive plant species and plant communities, and impacts to water quality, cultural resources, and native American values. The FSA/DEIS acknowledges that "The project would transform the Ivanpah Valley area from a mostly natural setting to a more industrial setting." FSA/DEIS at 6.18-6 (in the context of regional recreation).

In the FSA/DEIS this issue is looked at solely in the context of recreation and visual resources, however, nowhere in the document does BLM look at the issue of industrialization in the context of biological resources, the CDCA Plan as a whole, or how transformation of this area will affect the overall landscape-wide bioregional planning approach. As discussed below, there is a significant growth inducing aspect to the transformation of this area to industrial uses as well that is not adequately addressed in the FSA/DEIS.

***Response**: As stated in the comment, the use of Multiple-Use Class L lands for solar power development was considered in the CDCA Plan, and determined to be acceptable. Also, the FEIS concludes that the proposed project would result in a contribution to cumulative land use impacts, and that these impacts would not be mitigable. The likelihood and magnitude of these impacts have been disclosed in the EIS, and have been considered by BLM in the selection of a preferred alternative. They will also be considered in the decision whether or not to issue a ROW grant for the proposed project.*

Comment ISEGS-1-2: The project will be built on approximately 4,073 acres. But the Final Staff Assessment/Draft Environmental Impact Statement states: "The applicant's proposed increase in heliostat mirror surface area associated with the Optimized Project Design led the applicant to also propose an increase in total ISEGS area of about 300 acres and extension of the project boundaries of the three power plants by 250 feet along each perimeter...a portion of the increased heliostat surface area to be licensed ensures that the project will be able to meet its contractual output requirements even if the solar resource is less than forecasted. The final rows of heliostats may not be necessary. Pending the results of actual performance during plant operation, a decision will be made on whether or not to install the additional heliostats" (page 3-6). And more land: "In addition to use of the proposed right-of-way area, the applicant proposes some project-related activities to occur outside of the project fence, on land not included within the proposed right-of-way area. These would include inspection and maintenance of the fence, underground utility repairs, maintenance of drainage systems, and possible installation of new stormwater drainage systems. In addition to these activities, a roadway would need to be maintained outside of the project fence to allow vehicle and equipment access for these activities" (page 1-6). So after public comments are taken, after the environmental review process, and after the plant is built and begins operation, the applicant wants the option of more public land. The FSA/DEIS does not state whether this would trigger a new environmental review process, or whether this land is cryptically included in the present decision.

Response: *See Mitigation Measure LAND-2 in the DEIS. This Mitigation Measure required the project fence be inset 20 feet from the ROW boundary to allow for maintenance activities on the outside of the fence, and specified the conditions in which such work would require additional NEPA review. Full NEPA review of potential future activities cannot be performed at this time because need, location, and nature of those activities cannot be predicted.*

19.0 NOISE

Comment ISEGS-9-12: Ambient Noise Monitoring, Page 6.6-5 - This section states that "[a]mbient noise monitoring was not required for the ISEGS project, since Energy Commission regulations require such monitoring only when facilities where quiet is an important attribute of the environment would be impacted by the project. The community of Primm, Nevada, 4.5 miles distant, is too far from ISEGS to be significantly impacted by project noise. The Primm Valley Golf Club golf course is considered a less noise-sensitive land use."

The NPS considers the lack of ambient noise monitoring to be a significant failing of the DEIS. The lack of monitoring makes impacts on adjacent lands, such as Mojave National Preserve, impossible to predict therefore the analysis is incomplete. The analysis only addressed noise impacts on the town of Primm, NV and the local golf course. While the DEIS acknowledges the presence of Mojave National Preserve, the analysis fails to disclose impacts on the natural sounds cape and sound dependent

resources of the park. As stated above, without ambient sound monitoring at the project site and in the park, potential soundscape impacts are impossible to analyze or predict.

Comment ISEGS-30-8: Impact to soundscapes. How will the natural soundscape of the Clark Mountain exclave, and other locations within Mojave National Preserve be affected by ISEGS during construction, during operation, and cumulatively considering the multiple proposed projects for the Ivanpah Valley? Considering the level of alteration of the natural soundscape, what are the projected impacts to the lambing success of Clark Mountain and adjacent desert bighorn sheep populations?

***Response**: The FEIS text has been revised to add information regarding the impact of noise on the Preserve, and on bighorn sheep populations.*

20.0 PROJECT DESCRIPTION

20.1 Project Description - Site Security

Comment ISEGS-9-4: Section 3.3-Project Description - The general Project Description should include reference to appurtenant project features, specifically transmission lines and telecommunication facilities

***Response**: The text of the FEIS has been revised to provide additional information on the transmission system..*

20.2 Project Description – Heliostats

Comment ISEGS-1-4: Without constant cleaning, the Daggett Solar 2 power tower heliostats degraded in quality as the mirrors became sand-blasted. This ended up reducing the efficiency of the system, and it produced less electricity than hoped (Romero-Alvarez, Manuel and Eduardo Zarza. 2007. Concentrating Solar Thermal Power. In, Frank Kreith and D. Yogi Goswami (eds.), Handbook of Energy Efficiency and Renewable Energy. CRC Press: Boca Raton, London, New York.). Developers wanting to build these delicate systems in the harsh desert may not be taking this into consideration.

***Response**: The DEIS text on Page 3-15 specifies that the mirrors will be routinely washed.*

Comment ISEGS-1-17a: Will high winds whipping through the desert rip 20-foot wide heliostats off their bases like sails?

***Response**: Information on the stability testing of heliostats has been added to the FEIS text.*

20.3 Project Description – Grading

Comment ISEGS-33-12b: It's understood that the amount of grading is perhaps most responsible for and has the most impact on site degradation, in consideration of the complete or near complete or total loss of desert life, and the almost permanent degradation. (The FSA describes this as permanent in several places.) I could not find a specific description of the grading that would be required. I found various places indirectly indicating complete grading would not be needed. Page 4-61, in the section on photovoltaics: ... more severe effect on biological resources than the ISEGS project, which would not require grading over the entire site.

Descriptions of many of the alternatives claim lower acreage requirements for the same power output, but that the acreage would be completely graded.

Reasonable comparison of these alternatives is not possible without knowing the grading characteristics of the proposed technology. Please guide me to the grading description in the FSA, or provide a description. Of course, the primary question is how much surface disturbance. A corollary question is the survival rate of undisturbed or damaged / trimmed plants in the changed environment of less sun and surrounding plants, animals and insects.

***Response**: The DEIS text on Pages 4-56 through 4-62 discusses the grading requirements of various solar technologies. Most solar technologies, such as parabolic trough and photovoltaic, require an almost completely flat site which is completely graded. Power tower technology, on the other hand, does not require substantial grading. As described in Table 1 of the DEIS, the applicant made substantial changes in their proposed project design throughout the environmental review process to reduce the amount of grading required. The Mitigated Ivanpah 3 Alternative would reduce the required grading even further.*

Comment ISEGS-1-6: The applicant claims it has a way of "lightly" impacting the desert, not grading the entire 4,000 acres of all plant life, in a "Low-Impact Development" design. What does this involve? The vegetation that could "interfere with mirror movement to a height of 12 – 18 inches" would be clipped and pulped (page 1-9 in the FSA/DEIS).

Creosote may stump-sprout after cutting, but could die after repeated cuttings. Many other shrubs present on the desert fan are adapted to dispersing by seed, and are killed by cutting at this level. We doubt that this treatment will result in "light" impacts to the Mojave Desert scrub habitat, but will severely alter it and destroy much of it. We are not sure what fire fuel management policy the company has in mind for all this potential dying vegetation.

***Response**: While the applicant has proposed to leave vegetation in place, the EIS acknowledges that the effects of clipping, soil compaction, shading, and modified*

hydrology could impact vegetation anyway. Some of the analyses, such as the agency's stormwater modeling, assumed worst-case conditions, which would include full removal of all vegetation. In general, the EIS analyses of stormwater, weed management, fire, and impacts to vegetation were based on worst-case conditions. Any vegetation that survives as a result of the Low-Impact Development approach would reduce potential impacts.

Comment ISEGS-1-9: What are the details of the grading? What are the acres of vegetation that would be left in place in the heliostat field, and how many acres will be graded? How level will grading be on this sloping fan? How many acres will be scraped of vegetation and compacted by driving, but not graded?

***Response**: The estimates of temporary and permanent ground disturbance were provided in Table 2 of the DEIS..*

20.4 Project Description – Output/Efficiency

Comment ISEGS-1-16e: The applicant may have underestimated the amount of summer cloud cover over Ivanpah Valley, compared to central and western Mojave locations that are not as influenced by the Arizona Monsoon. Two years of weather measurements would not pick up the variation over decades in cloud cover patterns in the area, which would include many El Nino wet events; in addition, some summers over any ten-year period are well above-average for monsoonal activity in the east Mojave Desert. Problems have been encountered with the applicant's pilot project when clouds move over part of the heliostat field and become stationary, causing one side of the tower receiver to heat while the other side cools. This may cause damage to the receiver and necessitate placing the heliostats in the safety position. In addition, the superheater experiences problems when part of the heliostat field is covered with passing clouds, and must be put on standby mode. Twenty-five to 30% of rainfall occurs in the summer in the east Mojave Desert, where Ivanpah Valley is located, compared to 5 to 10% in the west Mojave. This could significantly reduce plant efficiency and negate any benefits to greenhouse gas reduction that ISEGS might provide. In addition, clouds cause a further decrease in any slight dispatch ability ISEGS would have during the sunlit hours. Cloud cover makes the solar field power generation untrustworthy, compared to natural gas. These types of solar thermal power plants will not compete with conventional power plants. Electricity prices from ISEGS may prove to be higher than anticipated.

Comment ISEGS-33-5: The DEIS is missing analysis of the net energy produced. It is impossible to judge if the project balances the environmental cost without knowing how well the project satisfies its basic purpose.

This analysis should compare net usable energy produced against the no-action alternative, which would neither use or produce energy. It therefore should include:

- Energy delivered to the customer, after it has gone through transmission lines.
- Energy required to upgrade or make new transmission lines.
- Energy expended during construction - machinery fuel etc.
- Personnel commuting energy (gas for commuting vehicles), during construction and production.
- Energy to transport the plant machinery to the site.
- Energy to make the mirrors and supports, power plant (turbine, boilers, ..), exclusion fence, and all other facilities. This energy should be compared to the no-action alternative, which would use no materials, and so should include the energy required to mine the materials, through the manufacturing processes to the finished product.
- Construction will advance construction machinery to its eventual end of life. The energy analysis should include the energy needed to either replace worn out machinery, or a percentage of life used. Again, this should include total cost of replacement, from mine to finished product. (Without this project, these costs would be avoided.)
- Parasitic energy during production.
- Energy from natural gas required between periods of operation.
- Energy required for decommissioning at the end of the useful life of the power plant.

Comment ISEGS-1-17b: At over 4,000 acres this plant's nameplate capacity is only 400 megawatts (MW), with a capacity factor of 28% and 7-10% transmission loss that would equal 100 MW. Compare this low efficiency to Southern Co./Georgia Power Co.'s Plant Bowen coalburning power plant which occupies 2,000 acres but puts out 3,160 megawatts maximum at 70-90% capacity. This does not take into account the terrible cost of mountain-top removal mining for coal in the Appalachians, but the question should be asked how solar thermal will replace coal? Desert-top removal is just as bad. For remote solar plants like the Ivanpah project, built hundreds of miles from cities, the cost of upgrading and building new power lines needs to be factored in.

Comment ISEGS-33-1: The facility will generate approximately 110 MW, not 400MW as stated throughout the documentation. This is closely in line with capacity factors for CSP solar generators in general. The 400 MW number is highly misleading, and should be changed to reflect the true output.

The table at the bottom of page 2-2 of the AFC (not the FSA/DEIS) shows 400 MW total 'Capacity, Net (MW)" implying the electricity generated will net out at 400MW. But it also shows the annual production will be 960,000 MWh per year. Since there are 365x24 = 8,760 hours in a year, dividing the 960,000 Wh per year by 8,760 hours per year gets 110 MW, nowhere near the 400 MW used to characterize the facility.

The difference is Capacity Factor, the ratio of the facility's maximum power output to its average over time. Wikipedia has a succinct definition:

> The net capacity factor of a power plant is the ratio of the actual output of a power plant over a period of time and its output if it had operated at full nameplate capacity the entire time.

Capacity Factor is commonly on the order of 25% for CSP solar facilities, due to nights, short winter days, low morning and evening sun angles, cloudy days, etc. The number for Ivanpah works out to 110/400 = 27%, consistent with other solar facilities.

This is a gross, misleading mischaracterization, and must be corrected. The number invites almost all readers to assume the plant will produce almost four times as much as it actually will produce. The misconception carries to media reports and to general public perception. It misleads the public, and probably many working on the project as well.

The difference between the oft-stated 400MW and actual production are not explained in the AFC or the FSA. An extremely small number of people would think to question the 400 MW number. An even smaller number would be able to locate the real output in the AFC and do the arithmetic.

That this is common with most solar facility descriptions is not a reason or excuse to allow it to happen in the Ivanpah documentation. It is wrong and misleading to the point of being fraudulent. One responsibility of the documentation is to fairly describe the proposal, and 400 MW does not do that. Because this is a common practice, the documents should explain the difference between maximum and average output, explain Capacity Factor, and explain that the output is commonly mis-stated.

Because it is easy to miss a single explanation in such a large amount of documentation, or not understand its implication, or be seduced by repetition of the 400 MW number, all documentation connected with the project should be corrected. Perhaps both numbers should be used side-by-side, and when comparing Ivanpah with other facilities the 400 MW number could be used, with explanation. The purpose is to alert and avoid misleading readers who are innocent of this situation.

Despite this gross discrepancy and the importance of facility output in judging benefit, it appears this concept is effectively missing from the documentation.

Here is a list of some locations in the early chapters of the FSA that mention 400 MW. There are weak hints to the discrepancy...Here are some media quotes. I googled 'Ivanpah Solar' to find them:...

Comment ISEGS-1-17c: The Ivanpah Solar Electric Generating System if constructed and operated as proposed, would generate 440 megawatts (MW) (maximum net output) of electricity, and would use natural gas to generate up to five percent of its capacity. We would like BLM to discuss capacity factor, the actual output of electricity that concentrated solar thermal power plants have produced to date. Without energy storage, the annual capacity factor of any solar technology is generally limited to about

25 percent of maximum according to the Renewable Energy Research Laboratory. ISEGS would not use storage technology. We disagree with the statement, "[ISEGS] would not create significant adverse effects on fossil fuel energy supplies or resources, would not require additional sources of energy supply, and would not consume fossil fuel energy in a wasteful or inefficient manner" (page 7.2-1).

Fossil fuel would have to be burned elsewhere on the grid as baseload, mostly as coal, as solar energy is intermittent. The Ivanpah solar plant will not run during the night, during cloudy days, and on cold winter mornings the small on-site natural gas burners will have to run to heat the system up. On page 7.2-2, the Final Staff Assessment/Draft Environmental Impact Statement (FSA/DEIS) states: "So far as staff can determine, methods for determining the efficiency of a solar power plant have yet to be standardized; research has uncovered no meaningful attempt to quantify efficiency. The solar power industry appears to have begun discussing the issue, but a consensus is forthcoming..."

But why is CEC/BLM comparing ISEGS to a baseload plant, which is supposed to produce energy at a constant rate? Examples of baseload plants include nuclear and coal-fired plants. Baseload plants typically run at all times of the year, and all night. Clouds do not turn them off. They also have dispatchability, able to ramp up or down to generate power on a human-based schedule. Peaks or spikes in customer power demand are handled by smaller and more responsive types of power plants called peaking power plants. Peaking plants are typically powered with natural gas turbines. Baseload power plants do not change production to match power consumption demands since it is more economical to operate them at constant production levels. Natural gas is used in base load, intermediate cycle, and peaking units. In California, more than three-quarters of natural gas generation comes from combined cycle gas turbines (CCGT) operated as baseload and intermediate cycle units. Solar thermal power is not dispatchable.

A load-following power plant gradually ramps up and down its power output to respond to scheduled changes in power demand over the course of a day. Gas, pulverized coal, and hydroelectric generators are commonly used to follow the load. "Solar photovoltaic or CSP [concentrated solar thermal, like ISEGS] without storage can approximately follow the load on sunny days, when peak demand is around mid-day" (From Solar Southwest Initiative).

So the ISEGS solar thermal power plants should be compared to a load-following plant, not baseload. But not being dispatchable on command, it would compare poorly even with this. We have witnessed the summer monsoon season in Ivanpah Valley shade much of the area with tall thunderheads every afternoon for weeks.

The FSA/DEIS states: "Based on a review of the proposal, staff concludes that the Ivanpah Solar Electric Generating System (ISEGS) would be built and would operate in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability" (page 7.3-1). But even for standard solar thermal plant

operation we question the placement of this project on an active floodwash fan in a desert with summer monsoon above the average for the western and central Mojave Desert (where other CSP projects such as Daggett Solar 1 and SEGS Kramer Junction plants, are located). Concentrating solar power needs a sharp sun image to be efficient. It is best done in deserts where there are no clouds or haze. Dust haze scatters light, and image efficiency plummets. Windstorms blow dust off Ivanpah playa frequently, and could lower efficiency for ISEGS. Cloud cover will force the plant to be turned off during winter and summer storms.

Comment ISEGS-2-10b: The Project Description may also (perhaps inadvertently) mislead the public by its characterization of the project as a 400 MW "nameplate" or "nominal". While the DEIS admits that the project capacity is most likely to be 28%. FSADEIS at 6.1-65 (Greenhouse Gas Table 3, note c). This means that the actual output of energy from the project would likely be closer to 112 MW. Moreover, the Project Description and the DEIS as a whole fail to account for other power losses including line losses during hot days which can be significant. Because an accurate project description is vital to a fair comparison of alternatives, the DEIS should have more clearly discussed the capacity factor and other potential energy losses so that the actual output of this proposed project could be compared to similar projects.

***Response**: An additional subsection has been added to Section 3 of the FEIS to discuss the factors affecting output of the facility, as requested by the comments.*

21.0 RECREATION

Comment ISEGS-2-4d: The adoption of the proposed plan amendment will change the multiple-use character of these lands which currently provides habitat for the threatened desert tortoise, grazing, and off-road vehicle routes in favor of a single use that will completely displace other uses on the proposed site and impact other uses significantly in the valley as a whole. For example, the proposal would require changes in the route network resulting in several routes which would need to be moved-those changes to the route network are not reflected clearly in the FSA/DEIS (nor are the likely direct, indirect and cumulative impacts of changing those route designations adequately identified or analyzed, as discussed in detail below). The FSA/DEIS simply concludes: "There will be no direct impacts because rerouting affected routes of travel would accommodate the limited amount of recreational use in the project location." FSNDEIS at 6.18- 10. However, BLM may need to amend the route designations in the area because these routes are part of a network and "rerouting" them along the fence line of a major industrial installation will undoubtedly change use of the previously existing routes and most likely cause increased use on other nearby routes, new unauthorized routes that will provide connections to the other routes, and/or entirely new unauthorized routes to be created to avoid the industrial site entirely. There is no evidence that recreational off-road vehicle users will be content to drive for miles along a fence adjoining an industrial site rather than striking off cross-country to connect with more scenic routes. Past experience shows that the latter is quite understandably a much more likely outcome

and BLM should recognize this in analyzing the impacts of this project. The Center suggests that a reasonable alternative to the proposed plan amendment would be to provide a plan amendment that would designate this area as a DWMA and/or also affirm the designation of the routes as limited to the extent that these routes should be treated the same as routes within DWMAs to protect the resident tortoise population.

The maps for the route designation clearly color-code the routes in this area as "DWMA" routes (See Map
Figure 2-1 NEMO Proposed Plan) which we believe should indicate that use of these routes should be limited as it is in the DWMAs. Oddly, however, the NEMO route designation FEIS fails to include these routes in table A-1 in Appendix A which presumably provided complete information on routes. As a result, it is impossible to discern whether these routes were designated open, closed or limited in the NEMO route designation or whether the proposed plan amendment is actually consistent or inconsistent with the route designations.

Comment ISEGS-1-20a: What kind of "mitigation" would be provided to compensate for disruption of access? Coliseum Road, currently a dirt road used by recreationists, would be paved to a 30-foot wide, two lane road for a distance of 1.9 miles from the Primm Valley Golf Club to the facility entrance. The road would be re-routed around the southern end of Ivanpah 2 before rejoining the current road to the west of the proposed facility. But two other dirt roads used by recreational users would be blocked and re-located outside of the project boundary fence. How will this affect recreational use of the roads? Even on weekdays we have seen several vehicles using Coliseum Rd. and other side roads. What are the estimated numbers of recreationist use through the area? This is a main area for access to Clark Mountain. How will the project affect road use?

***Response**: In the development of the DEIS, and in response to this comment, BLM has considered the likely effect of the re-routing of the roads on recreational uses of the roads. The re-routing of the roads is considered to be a minimal length (about 2 miles), and the impact on users is expected to be minor.*

Comment ISEGS-27-8: Mitigation Measure REC-1 proposes to mitigate the loss of recreation by establishing a viewing platform to see the ISEGS facility. While we concur with the viewing facility recommendation, the proponent should also pursue a permit from Caltrans for a freeway sign for the viewing facility exit. Again, the loss of recreational opportunities on another 12,000 acres of desert land is not addressed.

***Response**: Although not specifically stated in the DEIS, this Condition of Certification was specific to the CEC's certification, it was not intended to be a BLM-proposed mitigation measure. The FEIS has been modified to remove this measure as a BLM-proposed measure. However, Energy Commission staff believes the addition of a freeway sign has merit, and has added this requirement to their Condition of Certification REC-1.*

The DEIS addressed the impact on recreational resources due to the development of the 4,000+ acre project site. The comment regarding the loss of recreational opportunities on 12,000 acres is assumed to be made in reference to the possible 3:1 land compensation for desert tortoises. The actual land acquisition that would occur has not been determined, and may include acquisition of private land which would then be transferred to BLM – if so, these lands would be available for recreational opportunities. Therefore, no assumptions can be made, at this time, that any compensation lands would be removed from recreational uses.

Comment ISEGS-1-20b: The DEIS states, "The impact on the quality of outdoor recreational experience would diminish the experience of campers, hikers, hunters, and other recreational users" (page 1-26). Yet BLM concludes that impacts will not be significant. With a large increase in industrial facilities, traffic, noise, dust, and glare, the recreational experience of many users in the valley and in the surrounding Stateline Wilderness, Mesquite Mountain Wilderness, and Mojave National Preserve, will be greatly impacted. Wilderness values will drastically decrease with an industrial facility a mile from wilderness boundaries. Views from Clark Mountain will be changed from natural to developed. Wildlife will potentially leave the vicinity, impacting hunting and birdwatching. Campers may not use the fan anymore because of bright glare and reduced night-time dark skies. Hikers will have less land to explore.

"The proposed project would contribute incrementally to the long-term reduction of outdoor recreation quality available in the Ivanpah Valley area of the California Desert due to the cumulative effects of development leading to a transformation from a natural setting to a more industrial setting" (page 6-18.2). The No Action alternative should be considered to avoid these cumulative impacts to multiple use and recreation of public lands.

***Response**: The FEIS has been revised to eliminate the determination of significance, which was a requirement of the CEC's CEQA process in the FSA. The impacts of the proposed project, as referenced in this comment, remain in the text. BLM has considered this impact on recreation in its selection of a preferred alternative, and will consider it in the decision regarding whether or not to issue a ROW grant in the Record of Decision.*

22.0 SOCIOECONOMICS

Comment ISEGS-23-1: Located across Highway 15 from the Ivanpah Dry Lake, the 440 megawatt Ivanpah project will serve as a cornerstone of the High Desert region's economic development efforts. Ivanpah is estimated to directly create 1,000 local jobs at the peak of construction and 86 permanent jobs, as well as to indirectly create more jobs needed to supply materials and services during the project's construction and operation. The project is estimated to directly produce $650 million in wages and $400

million in state and local taxes over its thirty-year lifecycle, and again provide significant indirect benefits as well. BrightSource Energy's engineering contractor, Bechtel, has tentatively signed an agreement with the California Building Trades Council to ensure that California's workforce benefits from this project.

Projects such as BrightSource Energy's Ivanpah Solar Electric Generating System will not only bring hundreds of much needed construction jobs to the High Desert, but will attract other projects in its wake that will provide further employment and economic stimulus.

Comment ISEGS-31-1: ISEGS would directly create approximately 1,000 jobs at the peak of construction and 86 permanent jobs, providing a total of $650 million in wages over the project's thirty-year life cycle, as well as indirectly creating more jobs needed to supply the materials and services that are required for the project's construction and operation. ISEGS would directly provide $400 million in state and local taxes over its lifecycle, and again provide significant indirect tax benefits as well. The Applicant's Engineering, Procurement and Construction contractor, Bechtel, has executed an agreement with the California Building Trades Council to ensure fair wages and benefits for the workers who contribute to this project.

Comment ISEGS-36-2: Our Governor in California has repeatedly stated his support for solar energy projects in the desert. His comment, "if you can't build solar energy projects in the desert, where the hell else can you put them," says it all concerning the desire of those of us seeking new energy alternatives while employing local residents to build these projects. With an unemployment rate exceeding 18% in the desert community areas, it should be required of local elected leaders to justify their opposition to this job-creation opportunity with their own plan to make up for the 1,000 estimate jobs that Brightsource would be providing.

Comment ISEGS-36-4: Finally, my high school friend, Keith Marcione, is a member of the local union and a resident of Hesperia. He has informed me that all of his union members from Barstow to Victorville to San Bernardino will be needed for the construction requirements at Ivanpah. He also noted that the only reason Las Vegas is being used is because of the amount of construction workers needed to complete the project in the 18-24 month window. Construction jobs have been hit the hardest in San Bernardino County during this Great Recession. With the government revenue and energy development Brightsource will provide, our local elected opposition should justify giving up this energy development and job creation by providing their own feasible plan for either job creation or energy development. Short of that, they are simply government becoming the problem instead of being part of the solution.

Comment ISEGS-38-2: Located in California's San Bernardino County, across Highway 15 from the Ivanpah Dry Lake, the 440 megawatt Ivanpah project will serve as a cornerstone of the High Desert region's economic development efforts. This BrightSource Energy project is estimated to create 1,000 local jobs at the peak of construction and 86 permanent jobs. The project is estimated to produce $650 million in

wages and $400 million in state and local taxes over its thirty-year lifecycle, and provide significant indirect benefits as well.

Comment ISEGS-14-2: The Ivanpah SEGS project will serve as a cornerstone of California's new energy economy. It will create 1,000 local jobs at the peak of construction and 86 permanent jobs, and will indirectly create more jobs needed to supply materials and services during the project's construction and operation. Over its thirty-year lifecycle, the project would produce $650 million in wages and $400 million in state and local taxes; additional wages and tax revenue would come from indirect jobs and economic activity spurred by the project.

Comment ISEGS-20-2: There are important economic ramifications to this decision as well. Venture capital has historically played a crucial role in generating new enterprises and new jobs, and this is especially true in California. California's economy is one of the largest in the world, and it is fueled in part by a strong venture capital community and spirit of entrepreneurship. In 2008, 43% of VC investing in the U.S. overall came from Silicon Valley, and not surprisingly, a greater proportion of job openings in start-up companies are also concentrated in California. According to a recent study by the National Venture Capital Association, 39% of the start-up job openings in the country today are located in California (about 4,200 out of 11,000). And CleanTech has the potential to be a major source of VC-supported future job creation. A recent study led by UC Berkeley, Yale University, and the University of Illinois indicated that the passing of the current federal climate change legislation alone could lead to the creation of as many as 1.9 million jobs in the U.S., in part from new businesses that would arise to respond to new incentives and mandates.

Comment ISEGS-13-2: The Ivanpah SEGS project will create 1,000 local jobs at the peak of construction and 86 permanent jobs, and will indirectly create more jobs needed to supply materials and services during the project's construction and operation, Over its thirty-year lifecycle, the project is expected to produce $650 million in wages and $400 million in state and local taxes. Additionally, wages and tax revenue would come from indirect jobs and economic activity spurred by the project.

Comment ISEGS-15-2: The 440 megawatt Ivanpah project will be a major enhancement for the High Desert region's green economic development efforts. Ivanpah is estimated to directly create 1,000 local jobs at the peak of construction and 86 permanent jobs, as well as to indirectly create more jobs needed to supply materials and services during the project's construction and operation. The project is estimated to directly produce $650 million in wages and $400 million in state and local taxes over its thirty-year lifecycle, and again provide significant indirect benefits as well. BrightSource Energy's engineering contractor, Bechtel, has tentatively signed an agreement with the California Building Trades Council to
ensure that California's workforce benefits from this project.

Comment ISEGS-17-2: Located across Highway 15 from the Ivanpah Dry Lake, the 440 megawatt Ivanpah project will sever as a cornerstone of the High Desert region's

economic development efforts. Ivanpah is estimated to directly create 1,000 local jobs at the peak of construction and 86 permanent jobs, as well as to indirectly created more jobs needed to supply materials and services during the project's construction and operation. The project is estimated to directly produce $650 million in wages and $400 million in state and local taxes over its thirty-year lifecycle, and again provide significant indirect benefits as well. BrightSource Energy's engineering contractor, Bechtel, had tentatively signed an agreement with the California Building trades Council to ensure that California's workforce benefits from this project. Projects such as BrightSource Energy's Ivanpah Solar electric Generating System will not only bring hundreds of much needed construction jobs to the High Desert, but will attract other projects in its wake that will provide further employment and economic stimulus.

Comment ISEGS-17-4: We believe that BrightSource and other solar energy projects will provide greatly needed economic benefits to the High Desert and respect the environment at the same time. Please join us in supporting the proposed Ivanpah project as it leads our region back to economic prosperity and puts the High Desert on the vanguard of a new promising industry.

At a time where 1 in 5 people are unemployed, we cannot afford to chase opportunity away.

Comment ISEGS-19-2: When constructed, the Ivanpah project is estimated to directly create 1,000 local jobs at the peak of construction and 86 permanent jobs, as well as indirectly create more jobs needed to supply materials and services during the project's construction and operation. The project is estimated to directly produce $650 million in wages and $400 million in state and local taxes over its thirty-year lifecycle.

***Response**: Much of the information in these comments was included within the discussion of Noteworthy Public Benefits in the Socioeconomics section of the DEIS. These comments regarding the positive socioeconomic benefit of the proposed project have been considered by BLM in the selection of a preferred alternative, and will be considered in the decision whether or not to issue a ROW grant in the Record of Decision.*

Comment ISEGS-1-18: Solar technology is specialized. Most energy developers make promises to local communities that there will be hiring of local people, yet many energy developers usually bring people in temporarily and little benefit is provided to the local economy. Furthermore, when developers use only federal land, local economies receive fewer tax benefits. This is why a private land alternative should be considered.

***Response**: The EIS concludes that most of the construction and operations workers would be drawn from the City of Las Vegas within Clark County, Nevada, as well as parts of surrounding rural areas in San Bernardino County, California considering the project labor requirements are small compared to the size of the workforce available in the region. This information has been considered by BLM in the selection of a preferred*

alternative, and will be considered in the decision whether or not to issue a ROW grant in the Record of Decision.

Comment ISEGS-27-3: While perhaps not an issue that can be fully addressed under CEQA and NEPA requirements, the issue of cost of services from local governments would be an issue the County would pursue for projects under its jurisdiction. While the CEC may have permitting authority for this project, it does not provide local services such as emergency services or road maintenance. These are provided by the County. Local citizens and other businesses should not bear the brunt of subsidizing these costs for a for-profit operation such as this. The CEC has not fully analyzed the costs of these services to San Bernardino and Clark Counties. The County of San Bernardino will prepare its own fiscal impact analysis for this project's anticipated demand upon County services. As the CEC is well aware, the current state of the economy does not provide opportunity for local governments to provide services without recompense.

The proposed conservation of 12,000 acres of land for the desert tortoise is another economic impact to the County. Where there is no development allowed, there are no jobs and only minimal property tax or payment in-lieu of taxes (PILT). Also, while the traditional mitigation ratio approach requires vast acreages to be set aside as conservation lands, we do not see how that provides a viable habitat conservation strategy, and the resulting competition for mitigation areas could drive up land costs without increasing the effectiveness of mitigation.

It is not clear what economic loss might occur due to the impact to visual resources that may result in reduced revenues from tourism and the filming industry.

The future property tax revenue would be essentially limited to the power plant itself, as the heliostat arrays are exempt from property tax. Because the County's PILT is capped, the County will not receive the full amount it is entitled to and would otherwise receive if the land was held in private ownership. Again, the economic lost potential of the site and the mitigation lands is a socioeconomic impact not fully addressed in the DEIS.

While the project creates both construction jobs and permanent jobs, the DEIS lacks meaningful details regarding how nearly all the 90 permanent jobs will likely go to Nevada residents, which would further significantly reduce the economic benefits compared to a project located closer to San Bernardino County's more urban areas.

Comment ISEGS-27-10c: The County will further review the cost impacts to County services due to this project and we intend to come up with our own estimate of funding needed to offset the projected impacts. The California Energy Commission and the BLM should adopt policies to require developers of renewable energy projects under the agencies' jurisdiction to negotiate a formal mitigation agreement with the local jurisdiction in which the project resides.

Comment ISEGS-1-19: Turning the area into an industrial area is not consistent with a local tourism based economy. Mojave National Preserve has outstanding benefits to local economies in surrounding communities because its outstanding scenery attracts millions of visitors each year. Those visitors come to view nature and sweeping views. The cumulative impacts of surrounding this irreplaceable treasure with renewable energy facilities has the potential to drive tourism dollars away. We would like to request that BLM provide a full analysis on the potential impacts that reorganizing publicly supported desert protection measures would have on local tourism economies. Furthermore, tourism has stood the test of time. The new renewable economy that the administration is forcing upon us has not been tested for long-term economic sustainability. Because so much federal money is needed up front to make this experimental green economy work, we are worried that its potential failure will destroy the already stable tourist economy of the region. How would the construction of so many renewable projects impact the tourism of Primm and Nipton? Many visitors to the Mojave National Preserve stay in the hotels in these communities.

Comment ISEGS-6-33: The BLM should examine how sitting of large energy projects would impact private property values and quality of life for local communities, such as the Primm Golf Course and Nipton. We would like to request an analysis of the projects impacts to adjacent property owners, property values, and quality of life be addressed in the EIS.

Comment ISEGS-1-33: The BLM should examine how siting of large energy projects would impact private property values and quality of life for local communities, such as the Primm Golf Course and Nipton. We would like to request an analysis of the projects impacts to adjacent property owners, property values, and quality of life be addressed in the EIS.

***Response**: At this time, BLM does not have adequate information from San Bernardino County to substantiate its concerns regarding the project's potential to impact public services and facilities. As discussed in the FSA/DEIS Socioeconomics section, Table 8, the ISEGS project proponent is estimated to pay $3,195 in School Impact Fees to the local school district (per California Education Code, section 17620 and California Government Code, sections 65996-65997), as well as an estimated $2.2 million in annual property tax to San Bernardino County. Finally, in addition to BLM's conclusions that the proposed project would have no project-related significant adverse, direct, indirect, or cumulative impacts to police protection and emergency response services, we do not have regulatory authority to require a developer fee on behalf of San Bernardino County.*

23.0 SOIL AND WATER

23.1 Soil and Water - Surface Water/Stormwater

Comment ISEGS-6-14: Finally, EPA is also concerned about the indirect impacts to Ivanpah Dry Lake. As mentioned above, the ephemeral waters traversing the Project site originate in the Clark Mountains and drain to Ivanpah Dry Lake, a water of the United States. The DEIS fails to assess the indirect impacts to Ivanpah Dry Lake from the proposed Project. Indirect effects could include, but are not limited to: 1) changes in hydrology and sediment transport into Ivanpah Dry Lake; 2) increases in volume and velocity of polluted stormwater from impervious surfaces on the Project site; 3) decrease in water quality from the impairment of ecosystem services such as water filtration, groundwater recharge, and attenuation of floods; 4) disruption of hydrological and ecological connectivity from the Clark Mountains to Ivanpah Dry Lake; and 5) decreases in biodiversity and ecosystem stability. Reducing the scope of the project by 365 acres and, thereby, reducing potential discharges into waters should reduce the indirect effects to Ivanpah Dry Lake.

Recommendations:

- To minimize direct and indirect impacts, such as erosion, migration of channels, and local scour, do not place heliostats in washes.
- Commit to the use of natural washes, in their present location and natural form and including adequate natural buffers, for flood control to the maximum extent practicable.
- Demonstrate that downstream flows will not be disrupted due to proposed changes to any natural washes or the excavation of large amounts of sediment.
- Minimize the number of road crossings over washes in order to minimize erosion, migration of channels, and scour. Road crossings should be designed to provide adequate flow through during large storm events.
- Reduce the size of the Project by the 365 acres that are no longer needed for detention ponds in order to avoid high densities of rare plants and other environmental impacts.
- Locate facilities outside of waters. Estimate acreages or number of species protected as a result of these reduced Project size alternatives.
- Reduce the scope of the Project and discharges into waters, as described above, to reduce indirect effects to Ivanpah Dry Lake, a water of the United States.

Comment ISEGS-1-28: The proposed project site is located on an alluvial fan that acts as an "active stormwater conveyance" between the Clark Mountain Range to the west and the Ivanpah Dry Lake to the east. Widespread bajada flooding events and sheetwash deposition was noticed by surveyors. A total of 1,973 ephemeral washes were mapped on the project, 16 being "category 1= 36 to 85 feet wide." The applicant wants to build a delicate project where each mirror must be configured exactly using computer precision so that sunlight beams will hit distant tower receivers -- any

deviation could cause damage to the tower -- on an active floodwash fan with anastomosing channels that move over time unpredictably.

The applicant's proposed stormwater design and management system is a "Low-Impact Development design" which "attempts to minimize disruption to natural stormwater flow pathways." But the amount of grading would still be enormous, and does not outweigh the impacts to the land, water, washes, vegetation, wildlife, recreational use, and views…

Comment ISEGS-2-29: The FSAIDEIS identifies impacts to surface drainages on the bajada/alluvial fan that would be destroyed by the project but fails to adequately address avoidance and minimization of these impacts. The FSA/DEIS also fails to provide any specific discussion of mitigation for these impacts-again deferring the plan to a later date. Moreover, the DEIS fails to adequately identify and assess the impacts that the loss of natural flow across the alluvial fan will have on downslope resources or ground dwelling animals and plants. While the DEIS states that the project proposal will "minimize" the amount of grading, the proposed grading would include at minimum 170 acres in the southwest of the site and 360 acres in the northern and western areas of the site with additional grading for roads, "lay down" areas etc. FSA/DEIS at 3-15. Figure 12 in the Project Description shows even more extensive grading and "potential grading" areas. Moreover, the grading figure does not include the roads between the mirror fields which are not proposed to be fully graded but which would also significantly disturb surface soils and hence water flow and water quality across the site. On this basis as well the DEIS fails as an informational document.

Comment ISEGS-1-10: How will the many water crossings be constructed over the washes? Will reinforced concrete or gabion baskets be used? How will the design prevent the scour and washout of major asphalt access roads during storm events? Will offsite stormwater drainage be collected using a system of swales, berms, and existing ephemeral washes to control and direct stormwater through and around the ISEGS site? If so, will this be outside of the ROW? How many acres will this take up? Will separate environmental review be done for this drainage system?

Comment ISEGS-6-12: EPA is concerned about the potential impact to approximately 2,000 ephemeral water segments on the site, which could result in direct or indirect impacts to wildlife functions and values provided by 198 acres of waters of the State (at pg. 6.2-1). The Project area is located in the Ivanpah hydrologic unit of the South Lahontan Watershed. All drainage from surrounding mountains and alluvial fans collects inclosed basins in the Ivanpah Valley. Ivanpah Dry Lake, a water of the Unites States, is located approximately 2 miles east and downslope of the Project area. The Project area is located on a broad bajada that extends from the base of the Clark Mountains to the western shoreline of Ivanpah Lake. Numerous ephemeral washes occur throughout the broad, coalescing alluvial fans that convey storm water runoff from the mountains toward Ivanpah Lake. The washes range in size from small features (1-4 feet) to large broad washes over 85 feet wide (at pg. 6.2-13).

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.

According to the ISEGS DEIS, construction of the proposed Project is expected to result in direct loss of ephemeral waters on the site. In addition, the proposed Project will degrade the functions of waters through the placement of road crossings, heliostats, fencing, and diversion channels to divert flow around constructed facilities (at pg. 6.2-59). Further, a scour analysis conducted to evaluate the potential ofheliostat failure predicted the failure of more than 4,000 heliostats in a 10-year stonn alone (at pg. 6-9-28).

The SDEIS should commit to the use of natural washes, in their present location and natural form and with adequate natural buffers, for flood control to the maximum extent practicable. Because placement of heliostats would result in erosion, migration of channels and local scour, heliostats should not be placed in washes, to minimize direct and indirect impacts to the washes. 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. The SDEIS should demonstrate that downstream flows will not be disrupted due to proposed changes to any natural washes nor the excavation of large amounts of sediment.

Comment ISEGS-1-5c: On page 6.9-24 of the document, we learn more about the fragility of the mirrors: "An estimated mirror breakage rate of 0.1 mirrors per year likely much more (possibly in the thousands without mitigation and up to 50 with mitigation). The AFC [Application for Certification] states that broken mirrors would be replaced annually by one repair truck. However, the mirror repair activity would likely require several trucks. The AFC states that other repairs and security checks would be performed daily by one truck." How will the applicant and BLM insure that these broken mirrors not harm wildlife or recreationists downstream as fragments might be washed by floodwaters through the site?

Comment ISEGS-1-17d: But what surprises us most is the location of the proposal directly below a large rain catchment basin on the slopes of Clark Mountain. Did the engineers in the city understand desert alluvial deposition processes, or surficial geology and hydrology?

Researchers measured "normal" rain runoff on a fan below the Providence Mountains, just 60 km south of Ivanpah Valley in Mojave National Preserve, from 2003 to 2006. They found that several winter and summer rainstorms delivered more than 10 mm per day of rain, enough to initiate runoff, and some intense summer storms were greater

than 60 mm per hour. These redistributed sand, gravel, and organic debris. High-intensity summer rainfall could last an hour, often exceeding the infiltration rates of the soil (Miller, David M., David R. Bedford, Debra L. Hughson, Eric V. McDonald, Sarah E. Robinson, and Kevin M. Schmidt. 2009. Mapping Mojave Desert ecosystem properties with surficial geology. In, The Mojave Desert: Ecosystem Processes and Sustainability. Edited by Robert H. Webb, Lynn F. Fenstermaker, Jill S. Heaton, Debra L. Hughson, Eric V. McDonald, and David M. Miller. University of Nevada Press: Reno and Las Vegas.).

This was just over three years. Over the 50-year proposed lifespan of the ISEGS larger storms will occur, possibly as damaging as the flood that hit Furnace Creek in Death Valley National Park, and Surprise Canyon in the Panamint Mountains, California, in recent years.

This is an active sloping alluvial fan, not a stable flatland, seemingly not appropriate for a delicate heliostat array. In describing the engineering of a collector field, Romero-Alvarez and Zarza (2007:21-53) state: "Because of the large area of land required, complex algorithms are used to optimize the annual energy produced by unit of land, and heliostats must be packed as close as possible so the receiver can be small and concentration high. However, the heliostats are individual tracking reflective Fresnel segments subject to complex performance factors, which must be optimized over the hours of daylight in the year, by minimizing the cosine effect, shadowing and blocking, and receiver [light] spillage." Tracking control mechanisms continuously move the heliostats so that they focus solar radiation on the tower receiver. "During cloud passages and transients the control system must defocus the field and react to prevent damage to the receiver and tower structure" (ibid: 21-52). What if sediments from alluvial runoff tilt several heliostats in the field? Will operators be able to find and correct all heliostat deviations? How long will the plant be shut off while inspections are done after each storm and repairs are made? How much of a tilt would cause tower damage as reflected sun beams are aimed in the wrong direction?

In an investment cost breakdown of building a central receiver solar thermal power plant the heliostat field is the single most expensive part of the project, 40% of total capital costs. The power block comes next, at 32% of total (ibid:21-53). Yet, "Staff believes there are no special concerns with power plant functional reliability due to flooding (page 7.3-6).

Comment ISEGS-1-29b: The consequences of allowing flooding through the project would be too great. Looking at the quiet desert landscape it can be easy to underestimate the violence of a summer thunderstorm or El Nino winter flood. We have witnessed storm cells in Death Valley cause huge flash floods that have moved car-sized boulders down mountain canyons and destroy small buildings. The 2004 flood in Furnace Creek Wash dug out a new channel, took out the highway, and unfortunately caused the deaths of a few tourists who attempted to drive through the water loaded with moving boulders. Even floods that do not move large debris can damage structures

over time with the slow build-up of sand, gravel, stones, and logs, against fences, bending them down.

Recent paleoclimatological studies measuring high stands of lakes in desert playas and flows in desert rivers, such as the Verde in Arizona, have shown that the "statistics if extreme flows derived from twentieth century records are not representative of all hundred-year episodes of the past 1,400 years,...information of value for engineering applications as well as ecological understanding" (Redmond, Kelly T. 2009. Historic climate variability in the Mojave Desert. In, The Mojave Desert: Ecosystem Processes and Sustainability. Edited by Robert H. Webb, Lynn F. Fenstermaker, Jill S. Heaton, Debra L. Hughson, Eric V. McDonald, and David M. Miller. University of Nevada Press: Reno and Las Vegas.).

This is critical: in our lifetimes we may not have even seen the largest flood events that could occur in the desert. Historical records of rain in Ivanpah Valley cannot be used as predictors of future weather. Reinforcing heliostats will increase construction costs. The FSA/DEIS says that a "Drainage, Erosion, and Sedimentation Control Plan has been developed to mitigate the potential storm water and sediment project-related impacts. However, the calculations and assumptions used to evaluate potential storm water and sedimentation impacts are imprecise and have limitations and uncertainties associated with them. Given the uncertainty associated with the calculations, the magnitude of potential impacts that could occur cannot be determined precisely" (page 1-27). This again should be reason for the No Action alternative.

***Response**: The manner in which stormwater would affect, and be affected by the proposed project was one of the more substantial issues of discussion throughout the environmental review process, and was a major factor in the applicant's revision of the project design and stormwater management approach from the time of their original application to the time of the release of the DEIS. During this time, the applicant changed their stormwater management approach from one of active stormwater management to one favoring maintenance of natural flow pathways wherever possible. BLM provided detailed oversight of the applicant's stormwater modeling process, including reviewing and requiring modifications of the modeling methodology and assumptions, and independently conducting stormwater modeling using conservative assumptions. This process considered all of the factors made in these comments. Part of the purpose of the analysis of the Mitigated Ivanpah 3 and Modified I-15 Alternatives in the SDEIS was to evaluate alternatives that avoided the most substantial active drainage pathways on the project site.*

The results of these studies are documented within the Administrative Record, and each of the potential impacts mentioned in these comments was evaluated. The conclusions reached as a result of the extensive analysis are presented in the EIS.

The final conclusion, as documented in the EIS, was that the Low Impact Development approach, by minimizing disruption to natural flow pathways, would not adversely impact hydrology or sedimentation characteristics on the project site, or downstream of

the project site. However, the agency remained concerned about the potential for stormwater flows to damage heliostats, and as a result, developed a mitigation measure: SOIL & WATER-5 requires the development of a Stormwater Monitoring and Response Plan to monitor the site for stormwater damage (particularly to heliostats), and to take corrective actions in response to erosion that could compromise structural integrity and identified damage.

Comment ISEGS-1-11: The project area would be surrounded by security fence, which would be constructed of 8-foot tall galvanized steel chain-link, with barbed wire at the top as required. Tortoise barrier fence would also be installed, consisting of 1-inch horizontal by 2-inch vertical galvanized welded wire. The fence would be installed to a depth of 12 inches, and would extend 22 to 24 inches above the ground surface and integrated with the security fence. How will this allow the management of public lands for multiple use? Another question is how these fine-mesh tortoise fences will act as barriers to flood debris allowed to flow in washes through the project. Will tortoise fences act as dams, collecting gravel, cobbles, and branches, eventually changing the flows of these washes? Will floodwaters overbank their channels, causing damage to fences and other structures? The hydrology could become a mess here. Those of us who live in the desert know that the infrequent yet strong flash floods in the desert easily take ill conceived down fences.

Comment ISEGS-1-29c: The project could impact recreational use of Ivanpah Playa as well as tortoise habitat. We still do not understand how gravel, rocks, and woody debris will be allowed to "pass through the site in an uninterrupted manner" (page 6.9-26), when fencing around the project will include a tortoise exclusion fence consisting of 1-inch horizontal by 2-inch vertical galvanized welded wire installed to a depth of 12 inches, and extending 22 to 24 inches above the ground surface and integrated with the security fence. This will surely cause debris dams.

***Response**: BLM considered this issue in the development of the mitigation measure SOIL & WATER-5. This mitigation measure requires inspection of the fence following storms, repair of identified problems as a short-term responses, and consideration of modifying their stormwater management program in the long-term, if the system does not work.*

Comment ISEGS-1-29d: CEC/BLM may allow " design modifications to address ongoing issues. This may include construction of active storm water management diversion channels and/or detention ponds." "For activities outside of the approved right-of-way, the applicant will notify BLM and acquire environmental review and approval before field activities begin." This is unfair to the public -- if the applicant wishes to completely redesign its flood control plan for the entire project because it did not foresee the active nature of this fan, a new environmental review process should be initiated. And if giant berms, diversion channels, and other artificial flood control projects are going to be built outside of the project right-of-way, then this is just another cumulative

impact on the valley, as more public land will be graded, more tortoises moved, more rare plants destroyed.

***Response**: See Mitigation Measure LAND-2 in the DEIS. This Mitigation Measure addressed the requirement for the applicant to go outside of the fence to perform maintenance work, and specified the conditions in which such work would require additional NEPA review. This includes the construction of any additional drainage management systems. Full NEPA review of potential future activities cannot be performed at this time because the location and nature of those activities cannot be predicted.*

Comment ISEGS-1-29e: CEC/BLM require almost impossible feats of control from the project workers during operation: "Forty-eight (48) hours prior to each potential storm event, the applicant must visually observe and implement appropriate corrective action for: ...all storm water drainage areas, to identify any spills, leaks, or uncontrolled pollutant sources, ...any storm water storage and containment areas" (page 6.9-88). Workers must also collect water samples after storms and analyze their water quality and report to the Lahontan Regional Water Quality Control Board. Will the public be allowed to review these reports, since the project will be on public land?

***Response**: BLM has considered the requirement, as presented in the DEIS, and the comment. While it is true that the site area will be large, the Low-Impact Development design involves very few stormwater drainage structures, primarily within the power blocks. There will be no stormwater storage or containment areas. The number of hazardous materials storage and management areas will also be very small. Based on consideration of the actual number and locations of sites to be monitored, BLM considers that these requirements are feasible.*

23.2 Soil and Water - Groundwater

Comment ISEGS-1-3: Heliostat mirrors would be washed every two weeks on a rotational basis. Washing would utilize water accessed from the groundwater supply wells, following treatment in a water treatment system. Washing would be done using a truck mounted pressure washer, and use 42.7 acre-feet per year. But this basin has an undetermined amount of groundwater, and more wash-water may be needed, posing a risk to water resources in the area over time and taking into account the cumulative scenario of other developments proposed for Ivanpah Valley.

Comment ISEGS-1-27: In a very circuitous argument BLM and CEC conclude that impacts to the groundwater supply and quality would be "less than significant." Precipitation recharge in this basin is low: the Environmental Protection Agency, when analyzing the Ivanpah Valley Aquifer for the Coliseum Mine in the 1990s, was concerned about overdrafts from any water extractions, as the annual recharge is so small (only 800 acre-feet per year) (Reference: http://epa.gov/waste/nonhaz/industrial/special/mining/techdocs/gold/goldch3.pdf).

BLM and CEC quote two different groundwater studies from the that estimate 1,275 and 1,607 acre-feet per year of recharge, two other studies from 2000 that range from 2,845 to 5,800 afy, and a study in 2008 that estimated 2,806 afy. Conveniently, a study done by the applicant and another by CEC recently estimated a high of from 5,223 to 6,200 afy. No surprise here, those with most at stake found the most water to use. (As an aside three of the studies are missing in the references.)

Primm Valley Golf Club near the site uses 1,741 acre-feet per year, and the town of Primm, Nevada 1,470 afy, according to the FSA/DEIS (page 6.9-31). Mining uses 1,060 afy, and the town of Jean 740 afy. Already this spells trouble if you doubt that the recharge is high in the basin, but CEC and BLM use the highest estimates to claim that there is no overdraft and that pumping by the applicant will be just fine. When will the public be able to review the applicant's monitoring program to identify what changes are occurring in basin water levels?

The DEIS says: "This reduction in basin storage and water levels could translate into basin-wide impacts.... Staff believes that although the magnitude of long term potential declines cannot be predicted, the ENSR 2007 modeling results and aquifer characteristics suggest the time for basin wide water levels to decline substantially can take centuries and potential impacts during the life of the project and reasonably foreseeable projects would not be significant" (page 6.9-32). How does BLM know that groundwater lowering may not happen in a few decades?

"Based on the results of this groundwater modeling, the project's groundwater pumping is expected to cause local groundwater levels to decline over the project's 50-year life... Measurements in 2007/2008 suggest, the groundwater level in Coliseum well #1 may be below the top of the well screen, during some times of the year. Where drawdown lowers water levels below well screen elevations there is the potential for impacts due to incrustation and sedimentation of a well. Incrustation and sedimentation would result in increased maintenance costs and shortened life of the well and pump components. Because part of the well screen of Coliseum well #1 may already be exposed during current pumping, significant impacts may already be occurring" (page 6.9-34). This is too risky to allow more groundwater pumping, especially considering cumulative impacts. The project should not be approved.

Also, "Staff understands that use of the wells at the Primm Valley Golf Club has been reduced due to intrusion of brackish water that was not suitable for landscape irrigation (Broadbent 2002). The cause of the intrusion was believed to be due to pumping induced migration of saltier groundwater underlying the playa to the east" (page 6.9-37). (Broadbent and Associates, Inc. August 2, 2002. Groundwater Issues in the Ivanpah Valley, Nevada and California.). There is a concern over impacts to springs used by the local Bighorn sheep herd. In a visit in early December, 2009, we found bighorn sheep sign on a ridge trail leading down to Willow Spring at the base of the mountain, a few miles above the ISEGS project site. CEC/BLM denied any impacts would result from the

project's groundwater pumping. We think this is an assumption, as little appears to be understood of the groundwater in the area.

Comment ISEGS-6-15: The SDEIS should further describe groundwater availability for this Project and other projects within the region, as well as the uncertainty regarding potential cumulative impacts on groundwater resources. Given the potential for adverse impacts from pumping groundwater, it is important that all monitoring and mitigation information be provided to the public and decision makers. The Proposed Project would permanently eliminate over 4,000 acres of wildlife habitat. In the arid Mojave Desert, habitat and the springs are critically important for several special status species that rely on water sources and wetland vegetation communities.

Recommendations:

- EPA recommends the SDEIS clearly demonstrate whether there is sufficient groundwater for the lifetime of this Project and other reasonably foreseeable projects in the study area. Specifically, all existing and foreseeable projects identified in Tables 2 and 3 of the Cumulative Impacts Chapter should be reflected in the Soil and Water Resources Chapter Table 12 (at pg. 6.9-31) and Table 15 (at pg. 6.9-41), and the SDEIS should include estimated water use during construction and operation. We also recommend that the SDEIS address what measures would be taken, and by whom, should groundwater resources in the basin become overextended due to additional growth, continued drought, and the utilization of existing or pending water rights in the basin(s).
- The SDEIS should provide additional documentation to support the assumption that the proposed Southern Nevada Supplemental Airport will use water supplied by the Las Vegas Valley Water District. If this is not certain, estimates of water use should be included in Table 15 to ensure sufficient groundwater is available.
- To clarify the regulatory structure for protecting groundwater, we recommend the SDEIS describe the water right permitting process and the roles of all parties involved in protecting beneficial uses, human health, and the environment. This would include, for example, describing whether water right permits include special conditions; measures to mitigate direct, indirect, and cumulative impacts; and provisions for monitoring and adaptive management.
- EPA recommends the cumulative impacts analysis for groundwater include a discussion of the potential effect of future climate change on the proposed Project and groundwater development.
- EPA recommends that the ground water monitoring program be clearly defined and include a mitigation section for water resources. The ground water monitoring plan should describe the location of the monitoring wells and discuss contingency actions in the event of detection of contamination. The monitoring program should also assess the impacts to vegetation, wildlife, and aquatic resources. Funds to implement the monitoring program should be established and monitoring should be conducted on a regular basis. The FEIS, and ultimately the Record of Decision (ROD), should include a commitment to the monitoring program and funding for the program.

Comment ISEGS-28-10: The water usage is way too high and will create more problems than it solves. Water is becoming increasingly important and scarce in the Southwest and too much of this precious resource will be wasted and irretrievable through activities such as plate washing and dust control.

Comment ISEGS-2-28: The FSA/DEIS fails to adequately address the hydrology of the groundwater basins that are proposed to be pumped by the applicant and the likely impacts to other area waters including surface waters. The estimate for groundwater recharge is not sufficiently supported in the FSA/DEIS and fails to take into account persistent drought as well as the likely effects of climate change in this area. The FSA/DEIS simply assumes there will be no impacts to springs utilized by wildlife in the surrounding mountains and wilderness areas, although no meaningful information regarding the basis of this conclusion is provided.

Although the FSA/DEIS does not provide meaningful baseline data on the groundwater regime in this area, the Center understands that this area may be connected to the Death Valley aquifer and others in Nevada which function in unique ways such that pumping down gradient can often cause impacts to springs and seeps in mountain areas far up stream, contrary to the conclusory statements in the FSA/DEIS. Because the FSA/DEIS provides no basis for its statements and conclusions, it is impossible to discern whether staff has specific evidence regarding this aquifer and the connections between the area where the proposed ground water pumping would occur and the mountain springs were actually considered or whether staff is simply making assumptions about the functioning of the aquifer in this area. During the evidentiary hearings the CEC staff provided somewhat more information on the groundwater issues however there is still no evidence that the analysis in the FSA/DEIS adequately considered the impacts of long-term drought or climate change on the water resources in this area.

The FSA/DEIS also fails to adequately consider the cumulative impacts on water resources in this area - relying on assumptions regarding recharge that appear to be overstated and failing to address long-term drought and climate change as well as the potential impacts to surface resources from cumulative groundwater extractions.

Comment ISEGS-22-3: Water usage is of great concern. The Mojave Desert gets 2-10" of rain per year. The ground water will not recharge. The amount of water needed for this project will come by depleting ground water. The project consumes far more than a desert can support.

Comment ISEGS-1-26: We believe the DEIS underestimated the amount of water that will be needed for construction and operation of the project. Dust control during construction will often be more than estimated. What soil types are present on the site, and what is the percentage of silt and clay and components that may be windblown easily?

How much water will be used for dust control? How much water will be needed to wash off the panels? Solar developers consistently give inaccurate accounts of the amount of washing that will be necessary. Blowing dust requires the concentrated thermal unit at Kramer Junction to wash their mirrors every week. Please list the amount of acre-feet for panel washing. Will water softeners be used to prevent spotting? What chemicals are in the softeners? Will they be hazardous to public health and wildlife? Will they compact soils?

How long will water be held in any blow-down ponds associated with generator cooling? Solids and chemicals in this ponded water can enter the groundwater and affect drinking supplies. What will the effects of this water be on the aquifer?

The facilities would require pumping groundwater from a new well for "make-up water" for the steam system it evaporates from the dry-cooling process, and wash water for the heliostats, as well as potable water for domestic water needs. Approximately 16,000 gallons of water per night would be used for mirror washing (that would be almost 6 million gallons per year if trucks ran every night, 18 acre-feet, although the applicant seems to need more as elsewhere they say they need 42.6 acre-feet per year for washing). Which number is correct?

The applicant estimates project water consumption would not exceed a maximum of 100 acre-feet per year. But the applicant doubled the proposed number of mirrors on each heliostat and changed the mirror array fields from what was originally proposed, and then wanted more water. CEC and BLM were not pleased with this new demand: "Although this change increased the total surface area of all the mirrors combined by approximately 61.4 percent, the applicant has stated that the project's water demand would not exceed 100 AFY. Will more water eventually be needed, and how will BLM work with the applicant of this happens?

***Response**: The text of the FEIS, Section 4.10, has been revised to include an updated evaluation of groundwater use impacts.*

23.3 Soil and Water – Other

Comment ISEGS-1-48: Mowing of vegetation, grading, driving compaction, and flash flood damage repair will significantly impact the project site's 198 acres of ephemeral drainages...What lands will be acquired, and where? A discussion of whether mitigation lands will be one contiguous parcel or many, should be included. Mitigation lands for ephemeral streams should be considered independently of tortoise mitigation lands.

***Response**: The compensation associated with the 198 acres of ephemeral drainages is a state requirement. The exact nature of the compensation (land acquisition, improvements, or other measures) has not been identified by the state, so cannot be addressed in the EIS at this time.*

24.0 TRAFFIC

Comment ISEGS-32-1: In its January 2009 comments, CCDOA noted that the ISEGS project could adversely affect aviation operations at the SNSA or Jean Airport, and provided an expert report concluding that the ISEGS project would create glare effects that could "potentially blind a pilot during [a] critical phase of flight" (i.e., departure or final approach). Notably, FAA, too, has raised this very concern with BLM, noting, in particular, the proximity of the proposed ISEGS project to the SNSA site.

The Draft EIS recognizes that pilots and air carrier passengers may be affected by two types of glare impacts.

Comment ISEGS-32-2: First, with regard to energy intensity, the Draft EIS states that low-altitude aircraft passing over the project or within 1,000 meters of one or more of the heliostats would be exposed to solar radiation at levels that exceed the 1 kw/m2 maximum permissible exposure (MPE) limits for reflected sunlight, and that "the potential would exist for a person to experience [retinal] injury if he or she stared directly into the reflected solar radiation without blinking or looking away." (Draft EIS at 6.10-14). It then concludes that "the brightness of light reflected from heliostats would likely cause observers to avoid looking directly into the light for longer than a fraction of a second" but that "it is not conclusive to staff for observers in aircraft that personal reaction to bright light would adequately mitigate this risk of exposure that could cause retinal injury to one's eye." (Draft EIS at 6.10-16). Therefore, the Draft EIS proposes, as a mitigation measure, that the applicant prepare a Heliostat Positioning Plan in coordination with both FAA and CCDOA to avoid potential risk to health and safety.

Comment ISEGS-32-3: CCDOA supports the concept of a Heliostat Positioning Plan but requests additional information in the Final EIS that documents how this mitigation measure will effectively address potential glare impacts. For example, the Final EIS should address the following:

- How will the Plan capture available expertise on glare impacts? CCDOA recommends that the Plan be coordinated with appropriate experts such as academics with expertise in the area, and relevant user
- and professional groups, such as the Air Transport Association, Airline Pilots Association and/or the Aircraft Owners and Pilots Association.
- Who will be responsible for implementing the Plan? It is not clear from the Draft EIS who will be in charge of the Plan and how it will be implemented and enforced. If the Plan is simply drafted but never effectively employed, it will not serve any mitigating purpose. CCDOA urges that the Final EIS include implementation of the Plan as mandatory mitigation.
- How will the Plan respond to airspace changes? CCDOA recommends several reviews in addition to the scheduled updates: (1) an additional update should occur whenever FAA adopts any airspace changes in the region; (2) additional

updates should occur annually for the first five years after the SNSA opens because of contemplated modifications in airspace procedures based upon actual operations at this new airport.

In addition, CCDOA questions the threshold adopted by BLM when considering the potential impacts of a project that will be located only 8 miles away from a planned major commercial airport. The proximity between the ISEGS project and SNSA is particularly relevant: at a distance of 8 miles, pilots will be either in final approach or the initial stages of departure from the airport. These are the two stages of flight that are most critical for aircraft safety and where the greatest potential exists for complications from external distractions. In this context, retinal injury is simply too rigid a standard. Long before a pilot suffers retinal injury, he or she will suffer temporary distraction or impaired vision that could compromise the ability to control the aircraft safely. As a result, CCDOA recommends that the proposed MPEs in the Heliostat Positioning Plan be adjusted and engineered with the advice and input from experts to ensure that the potential glare effects are reduced or mitigated to a degree that pilots do not risk distraction or temporarily impaired vision (and not just retinal injury).

Comment ISEGS-32-4: Second, the Draft EIS recognizes that pilots may be affected by the luminance/brightness of the heliostats. Specifically, the Draft states that:...

In response to this data, the Draft EIS concludes that "it is not conclusive to staff that personal reaction to bright light would adequately mitigate this risk of exposure that could cause temporary blindness and compromise safety of an observer who may be responsible to navigate an aircraft or vehicle." Therefore, the Draft EIS recommends that the Heliostat Positioning Plan be prepared to address potential luminance/ brightness concerns. (Draft EIS at 6.10-19).

While CCDOA supports the concept of a Heliostat Positioning Plan, CCDOA questions the threshold adopted by the BLM. Like retinal injury, temporary blindness is also an inappropriately high standard to use for this project. Rather, the Plan should consider the point at which the luminance/brightness of the heliostats could cause any unsafe distraction to pilots.

Comment ISEGS-32-5: In its January 2009 comments, CCDOA noted that thermal plumes from the ISEGS project could create hazards to air navigation if the concentrated heat from the project produced enough rising hot air to cause turbulence to overflying aircraft, which might impact Visual Flight Rule (Y FR) traffic in the area that currently tracks along the 1-15 corridor en route to Jean Airport...

To mitigate against these potential safety hazards, the Draft EIS recommends Condition of Certification TRANS-6, which would require the applicant to coordinate with the FAA to: (I) notify all pilots using the airspace above ISEGS of potential turbulence from thermal plumes, (2) update all applicable airspace charts to indicate that plume hazards could exist up to an altitude of 1,350 feet above the ground surface, and (3) require

pilots to avoid direct overflights of the ISEGS site at or below this altitude during daylight hours. (Draft EIS at 6.10-22).

It is not clear in the Draft EIS whether FAA has been consulted on, or concurs with, these proposed measures. The only evidence of any involvement by FAA to date is its Determinations of No Hazard for the power towers. (Draft EIS at 6.10-21, Table 10). Those determinations only address the potential hazards caused by the height of the proposed power towers. There is no evidence in the Draft EIS that FAA has reached any determination about the effect of the thermal plumes from the air cooled condensors on air navigation and on the potential turbulence hazards. Given that BLM and CEC have explicitly recognized that in certain conditions, aircraft may experience turbulence as a result of the thermal plumes from the air cooled condensors, CCDOA recommends that BLM coordinate with FAA before issuance of the Final EIS to ensure that the federal agency with expertise on aviation safety concurs that BLM's conclusions are reasonable and that BLM's proposed mitigation is feasible. Only by engaging FAA directly on this matter can BLM meet its mandate to properly evaluate the degree to which the proposed action affects public health or safety. For example, BLM could require the applicant to file additional FAA Form 7460s (Notices of Proposed Construction or Alteration) for the air cooled condensors as a means of triggering FAA review of the potential hazards caused by thermal effects. While Form 7460s are traditionally used to examine height obstructions, FAA recognizes that the form is also an appropriate method of informing the agency of other potential hazards.

Comment ISEGS-32-6: In its January 2009 comments, CCDOA noted that under the Ivanpah Valley Airport Public Lands Transfer Act (Pub. L. 106-362), Congress concluded that the shortage in airspace in the Las Vegas region was so critical that, before any land in the Ivanpah Valley could be transferred to Clark County for the purposes of constructing the SNSA, CCDOA must develop an airspace management plan that minimizes impacts to the Mojave National Preserve, and ensures aircraft access to the Las Vegas Basin under visual flight rules at a level that is equal to or better than existing access. CCDOA prepared, and the FAA Administrator certified, an Airspace Feasibility Study, accordingly. In its January 2009 comments, CCDOA requested that the BLM examine the degree to which the ISEGS project may undermine these statutory conditions.

In response, the Draft EIS notes that Public Law 106-362 creates no legal obligations on the BLM, and that "none of the lands involved in the project would be used for air traffic and are not subject to the Ivanpah Lands Act." (Draft EIS at 6.10-32). While the Ivanpah Lands Act may not be a direct source of the agencies' legal obligations, it is illustrative of the problem that must be addressed and reflects the explicit Congressional direction on the importance of protecting airspace in the vicinity of the SNSA. As noted above, the Draft EIS acknowledges that the ISEGS project will have impacts on existing and proposed aviation traffic. BLM itself acknowledges that thermal effects will affect certain flights and that pilots will experience some glare effects. Given that fact, and given Congress' expressed concern that there is limited airspace available for new flight tracks, BLM is obligated under the Federal Land Policy and Management Act to

coordinate with FAA about the ISEGS project to ensure that the Congressional mandate for the SNSA Airport is not inadvertently thwarted by components of the ISEGS project. The fact that FAA evaluated the potential for the ISEGS project to result in height hazards to air navigation (Draft ETS at 6.10-32) is not enough. As noted above, FAA has not yet opined on the potential impacts of the ISEGS project to existing and planned flight tracks.

Comment ISEGS-32-8: FAA is concerned about the potential glare and thermal plume effects from the proposed project on aircraft using the airports at or around Jean, Searchlight, and Pahrump Nevada. Further, FAA is concerned about the proposed project's affects to the proposed Southern Nevada Supplemental Airport, just northeast of the proposed facility in Nevada. Please be advised that the FAA requires information on the heights of the proposed towers to determine if the proposed towers are a hazard to air navigation. We are providing you a copy of FAA Form 7460-1, Notice of Proposed Construction or Alteration for the proponent to complete and submit to the FAA. We recommend this form be completed and filed with FAA immediately so we can evaluate the proposed facility's effect on the safe and efficient use of navigable airspace. Please provide information on how individual mirrors will be positioned when not in use or when being serviced. FAA requires this information to determine if the proposed facility would be a hazard to air navigation.

Comment ISEGS-30-5: Cumulative impacts analysis of the project's impact on aircraft overflights, and the resulting impact to Mojave National Preserve. Construction of ISEGS would include 214,000 heliostat mirrors and seven, 469-foot towers. Based on glare from heliostats, the height of the towers, and the transmission lines needed to serve the project, NPCA asks that a full examination of existing commercial, private, and military routes be made. These should be compared to proposed updated routes, and potential routes from the proposed Southern Nevada Supplemental Airport to determine the immediate and cumulative impact that noise pollution from overflights will have to multiple points within Mojave National Preserve.

Comment ISEGS-30-6b: Impact of thermal plumes. NPCA requests additional information about thermal plumes be added to the EIS. Based on the information provided, they can produce turbulence for planes flying up to 1350 feet above the project site. Will thermal plumes force airplanes to modify existing and future routes, and if so, how will this impact Mojave National Preserve?

***Response**: The potential impact of thermal plumes on low-flying aircraft was evaluated on Page 6.10-22 of the DEIS. In response to the potential impact, the DEIS proposed Mitigation Measure TRANS-6, which requires the applicant to conduct additional coordination with FAA to issue a notice to airman and update airspace charts to identify the potential hazard from thermal plume. The applicant did file FAA Form 7460-1 for features of the project that required consideration of effects to navigable air space related to height of structures, and FAA responded that the project would not have any effect. FAA does not currently consider potential effects from glare, and in consideration of this, the FSA-DEIS included a Mitigation Measure (TRANS-3) requiring*

a Heliostat Positioning Plan that would monitor and resolve complaints regarding glare effects should they arise. As an additional measure in response to these comments, BLM contacted FAA to request additional coordination. As of the time of publication of the FEIS, FAA had not responded.

Comment ISEGS-27-4a: Another traffic safety concern would be the possibility that drivers distracted by the view of the power towers could swerve or slow down and thus cause more accidents. The DEIS mentions some mitigation measures and monitoring for the power tower luminance. The County, Caltrans and SANBAG, the County's transportation commission, should be included in the receipt and review of these monitoring reports. Ideally, the CEC would require a traffic safety and emergency services committee comprised of California and Nevada agencies, and Bright Source would be required to reimburse the agencies for their costs.

***Response**: Caltrans was already listed as a recipient of these documents. The FEIS has been revised to add the County and SANBAG to the list of recipients receiving monitoring reports in accordance with mitigation measure TRANS-4.*

Comment ISEGS-27-4b: The DEIS makes an effort to predict traffic impacts but is lacking any mitigation for cumulative impacts, which are noted as significant. A typical EIR would include a detailed traffic study prepared by a traffic engineer, analyzing all trips generated, including those from employees, suppliers and tourist stops from the freeway. If this was done, perhaps mitigation measures such as offsetting work hours, on/off-ramp and street improvements could be provided. The County and SANBAG should have the opportunity to review such a traffic study and have input on required mitigation.

***Response**: The Traffic Control Plan required as part of Mitigation Measure TRANS-1 is intended to address both the direct impact of the proposed project on construction traffic, and the contribution of the proposed project to the cumulative impacts.*

Comment ISEGS-1-23: The Energy Commission/BLM proposes a "Heliostat Operating Plan" that would avoid potential for human health and safety hazards, and monitoring would be done for the first 5 years to verify operational safety and respond to any "complaints." What liability measures will be taken for recreational visitors who might accidentally get eye damage? This is a strange new hazard for hikers in Mojave National Preserve and nearby wilderness areas. How will recreational drivers on the re-routed dirt roads that access Clark Mountain, Stateline Wilderness, and Mesquite Mountain Wilderness be protected if they cross the fan slowly and a "malfunction" happens? Such a giant experimental project should not be placed so close to high-use recreational areas and major highways.

"With regard to power tower receiver safety, the highest intensity of solar radiation expected to be reflected from a single power tower receiver at its surface would be as

high as 688 kw/m2. However, as noted above, the intensity of reflected light and solar radiation diminishes as distance from the source increases. Each tower on which each power tower receiver would be installed would be approximately 140 meters tall (459 feet). Each power tower receiver would be approximately 20 meters high, therefore the bottom of each power tower receiver would be located approximately 120 meters (394 feet) from the ground surface" (page 6.10-17). Brightness of light reflected at the surface of each power tower receiver would be approximately 555,000 cd/m2. The Energy Commission/BLM says this would be too far away for highway motorists to be affected, and would be equivalent to the brightness of a 100-watt light bulb as viewed from a distance of 115 feet. The Energy Commission/BLM admits, however, that this may be a distraction to drivers.

If, after measurements are taken of the glowing receiver towers in operation, luminance exceeds 89 cd/m2 at any of the nearest roads and power plant boundaries to each north, south, east and west face of each power tower, the Energy Commission/BLM proposes mitigation measures. We want to know what mitigation measures these would be? Apparently the receivers would have to reduce any luminance below this dangerous threshold, thus reducing power plant efficiency as well.

Response: *The EIS has analyzed and estimated the luminance, potential for retinal damage, and potential for distraction to pilots and drivers, and concludes that none of these issues would be likely to have an adverse impact. However, the EIS acknowledges that the amount of operational data on these facilities is limited, and therefore there is uncertainty associated with the impact conclusion. To address the uncertainty, BLM has developed the mitigation measures TRANS-3 and TRANS-4, to require monitoring of the potential effects. Because the current conclusion is that no adverse impacts are expected, the mitigation measures have been developed primarily for monitoring, complaint response and reporting purposes. Should the identified issues actually cause adverse impacts, then the response to those impacts would need to be developed at that time.*

Comment ISEGS-5-11: Reconfiguring ISEGS along the I-15 corridor would not present any significant human health impacts or safety hazards from glare beyond what is already anticipated by the current configuration and expected to be minimized by conditions TRANS-3 and TRANS-4, as long as the power tower receivers and I-15 facing-heliostats are located at least 1,000 meters from the highway.

The DEIS concluded that solar radiation and light reflected from the proposed heliostats (but not from the proposed power tower receivers) "could cause a significant human health and safety hazard to observers in vehicles on adjacent roadways." 6.12-29. The CEC staff recommended two measures to "minimize to the maximum extent possible and reduce health or safety risks" from the potential impacts of glare. DEIS at 6.10-1. TRANS-3 requires ISEGS to identify 1) potential sensitive receptors to glare, including motorists, who could access locations close to the project and 2) heliostat movements and positions that could result in solar radiation reflected away from view. 6.10-16.

TRANS-3 also requires ISEGS to create a Heliostat Operating Plan designed to avoid potential human health and safety impacts from glare to sensitive receptors and to monitor – and investigate and mitigate as necessary – less-than-significant impacts. Id. TRANS-4 requires Ivanpah to verify that glare levels do not exceed a certain limit and requires glare monitoring over the life of the project. DEIS 6.10-20.

The CEC's proposed conditions would have similar impact reduction and risk minimizing effects if the Project was reconfigured on land adjacent to I-15. To address visual impacts, the CEC staff analyzed the energy potentially absorbed by the retina ("solar radiation"). DEIS at 6.10-13. The highest intensity solar radiation emitted by a single heliostat is 3.125 kw/m2 at a focal distance of 500 meters. This rate is well below what the CEC staff identified as maximum permissible exposure (MPE) of reflected sunlight for momentary exposure (10 kw/m2), but above the MPE for continuous exposure (1 kw/m2). 6.10-14. However, at 1,000 meters, the intensity of solar radiation drops to less than 1 kw/m2. Id. The applicant has also indicated that the project's optimization software would prevent the mirrors from being aimed toward the freeway, further decreasing potential impacts from the heliostats. Thus, the impacts of solar radiation from I-15 facing-heliostats located 1,000 meters from I-15 do not pose a significant risk to human health and safety. DEIS at 6.10-15.

The CEC staff also evaluated the luminance or brightness perceived by observers at the project's proposed site. The brightness of reflected light from a single heliostat is approximately 1.34 billion cd/m2 at its surface. 6.10-18. Brightness dissipates to 35 million cd/m2 at 370 meters from the heliostat surface, a temporarily blinding level if viewed directly, causing an observer to divert his eyes. Id. Nonetheless, this measurement is well below the FSA/DEIS standard for lighting of roadways signs (44 to 89 cd/m2). Id. at 17- 18. The intensity of brightness continues to diminish as the distance from the source increases; therefore, the intensity of brightness to motorists located at least 1,000 meters from I-15 facing-heliostats would be well below 35 million cd/m2. DEIS at 6.10-19.

CEC condition TRANS-4 would reduce luminance at the nearest receptor, minimizing the potential distractions to motorists caused by heliostat specular reflections and diffuse reflections from the power tower receivers. 6.10-20. TRANS-4 would provide the same mitigation to visual impacts at a reconfigured site adjacent to I-15. Luminance from both the I-15 facing-heliostats and power tower receivers at a distance of 1,000 meters from I-15 is not likely to pose human health and safety risks above that expected by the current proposed configuration. Moreover, TRANS-3 and TRANS-4 would mitigate any unavoidable luminance impacts on passing motorists.

***Response**: The potential impacts of the Modified I-15 Alternative on glare and distraction to drivers were evaluated in the SDEIS. Similar to the proposed project, BLM concludes that adverse impacts would not be likely, and if they occurred, they would be identified through the monitoring required in mitigation measure TRANS-4. However, BLM did state, in the SDEIS, that bringing the heliostats and power towers*

closer to I-15 in the Modified I-15 Alternative can only increase the potential for adverse impacts over those of the proposed project.

Comment ISEGS-32-7: The Final EIS should include FAA in the list of regulatory agencies that administer laws, ordinances, regulations or standards "that may be applicable to the proposed project." (Compare, Draft EIS at 2- 17 - 2-19). In addition, FAA's 2008 letter to Mr. George Meckfessel (attached as Exhibit B) should be included in the Table of scoping comments received. (Compare, Draft EIS at Introduction Table 1).

***Response**: The FAA has been added to the list of regulatory agencies, and the list of scoping comments.*

25.0 VISUAL RESOURCES

Comment ISEGS-1-30: BLM and CEC concluded that the proposed Ivanpah Solar Electric Generating System project would result in a "substantial adverse impact to existing scenic resource values" as seen from the Ivanpah Valley and Clark Mountains. The project directly adjoins a national park unit and two designated wilderness areas, and a recreational land-sailing site of regional or greater importance on Ivanpah Playa. BLM and CEC were uncertain as to the level of discomfort or disability glare from the solar tower receivers, and were concerned about the cumulative visual effects of renewable projects on the California Desert Conservation Area and Mojave Desert as a whole…

How will the applicant mitigate the disruption of views and scenery of these popular tourist and recreation areas?

The National Park Service estimates that 576,840 people visit Mojave National Preserve, and as many as 51,915 visit Clark Mountain."The overall area of the three proposed project phases would be approximately 6.4 square miles or 4,073 acres, most of which would be occupied by mirror fields. Under the modified project plan, there would be one power tower each at Ivanpah 1 and 2, and five towers at Ivanpah 3. All proposed towers would have an overall height of approximately 459 feet (140 meters), with an additional 5 to 10 feet of FAA required lighting. Mirror array units would be approximately 12 feet (4 meters) tall.... Power towers would require day and night FAA strobe lighting. Other visually prominent structures would include steam turbine generators, air-cooled condensers, water storage tanks, a 16-acre substation, administrative and maintenance facilities, and new transmission lines and towers (described below). Of these the most prominent would be the Ivanpah 1 air-cooled condenser (approximately 92 feet in height)...; and new transmission towers" (page 6-12-12). We are unclear on the structure and size of any evaporation ponds.

"At certain times of day, diffused glare from the mirror surfaces would be prominent, similar to a lake surface in sunlight; at other times it would not, as in this simulation" (page 6-12-22). How will recreationists be affected by this glare? Will tourism suffer in Mojave National Preserve?

Considering a Key Observation Point at Umberci Mine, a popular hiking destination in Stateline Wilderness Area, the FDA/DEIS states: "Impact Significance –This strong level of overall project visual change contrast would not be compatible with the moderate overall visual sensitivity of the Ivanpah Valley, nor with the high overall visual sensitivity of the Stateline Wilderness Area in which this viewpoint is located. This level of impact is thus considered to be a significant visual impact" (page 6-12-25). No mitigation would be available. Because of this, the No Action alternative should be chosen.

The Visual Resources section of the FSA/DEIS lacks significant information about the potentially negative impacts that lighting from the facility would have on the wilderness values of the adjacent Mojave National Preserve, Stateline Wilderness Area and the Mesquite Mountains Wilderness Area. Potential impacts to recreational activities such as star gazing to visitors of these conservation areas is left out."Nighttime construction lighting, without adequate mitigation, could result in light pollution affecting the Mojave National Preserve," says the FSA/DEIS (page 6-12-27). "FAA-required aircraft safety lighting, which is anticipated to include bright strobe lighting atop the 7 project towers, could not be shielded to prevent upwardly directed light" (page 6.12-30). The FSA/DEIS underestimates how many Mojave National Preserve visitors stay in Primm hotels. We also think more analysis is needed on how the project would affect the viewscape of Nipton, a popular tourist hotel on the edge of Mojave National Preserve.

Comment ISEGS-21-3: The FSA notes that impacts to visual resources cannot be mitigated. The largely-pristine Ivanpah Valley will never be the same if this project is constructed. Views from the New York and Clark Mountains in the Mojave National Preserve, and the Stateline and Mesquite Wilderness Areas will be forever altered by the Ivanpah SEGS.

Comment ISEGS-8-15: Visual resources are important public resources identified in both FLPMA and the CDCA Plan. The Clark Mountains, part of the Mojave National Preserve, rise to almost 8,000 feet from the Ivanpah Valley and view of the mountains from the valley will be marred by the ISEGS project's power towers, each rising to 459 feet above the valley and array of 428,000 mirrors. Scenic views from two wilderness areas (Mesquite and Stateline) will also be adversely affected. Hundreds of thousands of visitors pass through the Ivanpah Valley annually. While most of these simply pass through along the major highways, many visitors do stop to visit, use and enjoy the Ivanpah Valley's public lands, Mojave National Preserve, Wilderness Areas, and recreation areas. The proposed project will significantly impact visual resources for these visitors. In the FSA/DEIS the BLM has failed to identify alternatives or mitigation measures that will avoid these impacts other than the "no action" alternative.

***Response**: As stated in the comments, the EIS states that direct adverse impacts to visual resources will occur, and cannot be mitigated. This information has been considered by BLM in the selection of a preferred alternative in the FEIS, and will be considered in the decision whether or not to authorize the ROW grant in the Record of Decision.*

Comment ISEGS-9-13: Visual Resources, Page 6.12-29,-30 and -42 - These pages state that "[a]ccording to comments of National Parks Conservation Association, the Mojave National Preserve contains some of the most pristine night sky views in the continental United States, and new artificial lighting may represent a deterioration of that resource." These statements go to say that" [s]taff is not aware of specific thresholds by which a significant light pollution impact may be defined." However, the DEIS concludes that with mitigation, downward aiming of operational lights and the seven new aircraft safety lights on top of the receiver towers, night lighting of the project… " would not likely constitute a significant impact ."

Statements made in this section of the DEIS regarding lack of impact, yet stating that "staff is not aware of specific thresholds by which a significant light pollution impact may be defined" are conflicting. The DEIS needs to adequately assess impacts on the dark night skies, nocturnal species, and visiting public to Mojave National Preserve.

Comment ISEGS-30-9: Light pollution. How will light pollution from ISEGS diminish the night sky viewing from the Clark Mountain exclave, and form other locations within Mojave National Preserve?

***Response**: The text in the FEIS regarding the impact of night-lighting has been revised.*

Comment ISEGS-9-14: Decommissioning Impacts, Page 6.12-30 should include specific reference to appurtenant project features including transmission and distribution lines, and telecommunication structures.

***Response**: The text in the FEIS has been revised in response to this comment.*

26.0 WILD HORSES AND BURROS

Comment ISEGS-28-1: The current proposal is to install a Solar Power Plant within the Clark Mountain Herd Area, a Congressional dedicated habitat set aside for the preservation and protection of wild burros “where presently found” in 1971 after the passage of the Wild Free Roaming Horse & Burro Act.

The Clark Mountain burros historic Herd Area was originally designated as233,370 acres. Through BLM land use decisions and HMA designation, only 75,349 acres were deemed suitable for longterm management, a loss of 158,021 acres of habitat.

The Clark Mountain burros were one of the oldest and most unique wild burro herds in America. Living in relative isolation for four centuries, their genetic tests revealed the herd had a "high proportion of rare variants" based on genetic tests performed by leading genetics Dr. Gus Cothrane at the behest of the National Wild Horse & Burro Program on wild herds across the West.

In 1994, with the passage of the California Desert Protection Act (CDPA), the burros only perennial water source was transferred to National Park Service (NPS) through the creation of the Mojave National Preserve. NPS then issued a General Management Plan declaring a zero burro management policy for the Clark Mountain wild burros.

Comment ISEGS-28-2: No records can be found to determine if BLM initiated consultation with NPS in order to develop a Memorandum of Understanding (MOU) so that both agencies may fulfill their respective mission statements and agency objectives or that NPS ever considered the request of Senator Feinstein to implement management plans to preserve and protect the Clark Mountain wild burros found within the Mojave National Preserve.

In 2002, BLM signed the Record of Decision for the Northern and Eastern Mojave Desert Management Plan (NEMO), an amendment to the 1980 Bureau of Land Management California Desert Conservation Area (CDCA) Plan.

During the planning process of NEMO, five Alternatives were analyzed within the Draft Environmental Impact Statement, four of which continued to manage federally protected wild burros as per PL 92-195, the Wild Free-Roaming Horse and Burro Act (WFRHBA) including the Preferred Alternative.

Also included within the Alternative analyzed were upward adjustments of wild burro AML in the Clark Mountain Herd Management Area, supplying alternative water sources on public lands, modifying existing HMA boundaries to preserve and protect both wild burros and desert tortoise and initiating a five year carrying capacity range analysis.

One other Herd Management Area was also analyzed within the NEMO planning process, that being the Chicago Valley HMA. Prior to BLM issuing the NEMO ROD, the Appropriate Management Level for wild horses was 28 and wild burros was 28 in the Chicago Valley HMA.

Comment ISEGS-28-3: Only two management actions were analyzed within the Alternatives presented for the Chicago Valley HMA, these being, No Action, with continued management as set forth in the CDCA and a second Alternative that proposed to reduce AMLs of wild horses from 28 to 12 and reducing AMLs for wild burros from 28 to 0.

The Alternatives presented within the NEMO DEIS indicate a wide variety of management options and mitigation measures were at BLMs disposal in order to

continue to be in conformance with federal laws mandating wild horses and burros preservation and protection in self-sustaining herds on public lands administered by the BLM as per the WFRHWA.

Additionally, BLM regulations regarding land use plans require conformance with existing laws such as the WFRHBA within their existing framework; failure for land use plans to conform with pre-existing laws nullifies the decisions issued by agencies overseeing these plans.

Comment ISEGS-28-4: Despite these facts and without sufficient legal authority to do so, BLM CHOOSE to completely eliminate all federally protected wild burros from Congressionally dedicated and federally designated critical habitat set aside on public lands deemed necessary to insure their preservation and protection.
On August 5th, 2009, in Colorado Wild Horse and Burro Coalition, Inc. vs. Secretary Salazar (See Attachment II), a Memorandum Opinion was issued by Judge Collyer, which stated,…

The Secretary of the Interior and BLM had overstepped their authority by issuing "zero AMLs" for federally protected habitat and herds by declaring every animal in the Clark Mountain Herd Area as "excessive" with no data to support the issuance of the 2002 NEMO ROD. The Wild Free-Roaming Horse & Burro Act provides no authority to issue a "zero AML" and/or remove all or any "non-excessive" wild horses and burros from federally designated Herd Areas.

This ruling is especially pertinent to BLM managed lands that have issued zero AMLs for wild burro herds such as the Clark Mountain and Chicago Valley Herd Areas as a federal court has deemed the BLMs decision of a "zero" population for animals that Congress and federal law obviously intended to protect within their federally designated and protected habitat is being done without the appropriate federal authority to issue such a decision or implement such an action.

Comment ISEGS-28-5: Therefore, though the 2002 NEMO decision had 4 out of 5 alternatives that were capable being in conformance with the Wild Free-Roaming Horse and Burro Act by providing mitigation measures to preserve and protect them in balance with other uses. BLM demonstrated an abusive of authority and discretion by arbitrarily choosing an Alternative to issue "zero" AMLs for the Clark Mountain burros, even though lawful Alternatives were available.

A land use plan arbitrarily and capriciously authorized "zero" wild burros even though Alternatives presented in the NEMO Amendment indicated that there were mitigation measures available to BLM to utilize to find an appropriate number of wild populations that could exist in a thriving natural ecological balance with other uses. BLM used no data to support this decision and therefore, the land use plan must be revisited and amended to incorporate, or should I say, re-incorporate the original intent and foundation of federal law requiring the Secretary of the Interior to exercise their

discretion in ways that both preserve and protect these irreplaceable resources for the benefit and future enjoyment of the American public within the thriving natural ecological balance and multiple use relationship for public lands. The test as to appropriate wild horse population levels is whether such levels will achieve and maintain a thriving ecological balance on the public lands. Nowhere in the law or regulations is the BLM required to maintain any specific number of animals or to maintain populations in the number of animals existing at any particular time Dahl v. Clark, supra, at 595. A determination that removal is warranted must be based on research and analysis, and on monitoring programs, which include studies of grazing utilization, trends in range conditions, actual use, and climactic factors...

Furthermore, BLM records of rangeland health surveys prior to 2002 indicated no rangeland deterioration was noted at the prior AMLs within the Clark Mountain HMA, then established at 44 wild burros. Also, no current data or rangeland surveys prior to the 2002 NEMO amendment and decision were conducted or utilized in support of this decision.

Comment ISEGS-28-6: In the Environmental Assessment (CA-690-EA04-27) issued by the Needles Field Office, the BLM attempted to imply that the total elimination of all wild burros within the Clark Mountain Herd Area was required to conform to initiate measures for protection and necessary for the recovery of the Desert Tortoise within the Ivanpah area.

With respect to noted impacts by wild burros to desert tortoise, no data, viable information or studies were done within the Clark Mountain area regarding either their impacts to rangeland health or their affects on desert tortoise whatsoever.

In 2005, U.S Geological Survey (USGS) issued a report titled, "Threats to Desert Tortoise Populations: A Critical Review of the Literature". Only one paragraph was included regarding wild horses and/or burros impacts on the threatened desert tortoise found on page 57...

As it clearly states, USGS could find NO PUBLISHED STUDIES TO SUPPORT WILD BURROS POSE A THREAT TO DESERT TORTOISE! Additionally, even the scant suggestions of what their impacts might be was determined as speculative only...

On November 30th, 2007, U.S. Fish & Wildlife issued an "Amendment to the Biological Opinion for the California Desert Conservation Area Plan [West Mojave Plan] (6840(P) CA-063.50) (1-8-03-F-58) on the Desert Tortoise within the Mojave desert and Clark Mountain area. This new information needs to be evaluated and included in a new Herd Management Area Plan and appropriate management level amendment. For example, USFWS allowed percentages of annual "incidental take" within the livestock allotments located within or near the Clark Mountain wild burro Herd Area and Desert Tortoise habitat...

This determination most likely applies equally to wild burro herds, who have been noted to be much more observant and aware of the surrounding environment than domestic livestock or even horses due to their historic and continued use in high, steep and treacherous terrain based on their impeccable footing in these environments.

Comment ISEGS-28-7: No records can be found of any number of desert tortoise found affected by wild burro herds living within the Clark Mountain Herd Area. The DOI, USFWS or BLM provided no evaluation to determine if wild burro herds affect would conform to similar "incidental take" allowed percentages as has been allowed with livestock grazing in order to preserve and protect their populations and habitat, either before or after issuing the "zero AML" decision or since the updated report came out...

Obviously, no scientific data exists to support the DOI/BLMs contention that issuing a zero AML for the Clark Mountain wild burros was necessary in order to protect Desert Tortoise occurring in the area.

On June 1, 2009, California State Wild Horse and Burro Lead Amy Dumas reported a remaining population of approximately 60 wild burros within the Clark Mountain area (per.com. via email).

On August 25, 2009, Laura Cunningham, a Desert Ecologist and member of Basin and Range Watch issued a statement of range conditions in the Ivanpah Valley in the vicinity of the Clark Mountain Herd Area based on surveys conducted in the area between February 11 and August 12, 2009. (See Attachment III)

Ms. Cunningham noted that in areas with signs of wild burros such as visual observations, burro tracks or dung, only one out of ten grass bunches appeared to be utilized with both browsing and trampling of ground appearing light. Also noted were heavy trampling and evident overgrazing in the area along I-15 in the lower valley around a corral and old water tank-trough. No burro signs were seen in this part of the surveyed area. Based on Ms. Cunningham's expertise as a Desert Ecologist and her direct observations of impacts by both cattle and wild burros occurring in the areas surveyed, she issued the independent recommendation that the cattle allotment should be retired due to apparently heavy use in places while wild burros should continue to be allowed.

Comment ISEGS-28-8: This independent analysis re-affirms the consistently demonstrated evidence and data that a wild burro herd of approximately 60 animals in their Congressionally dedicated habitat known as the Clark Mountain Herd Area poses no threats to rangeland health values, risks no deterioration of the range associated with overpopulation of wild burros or even makes significant enough impacts to ecosystem health that may pose even a potential threat to the Desert Tortoise populations in the area...

By the standards set forth in the NEMO ROD, BLM must go back and fix the fatally flawed management plans that issued a decision to "manage" for zero wild burros in the

Clark Mountain Herd Area as this decision exceeded their authority and has no legal support or basis. A federal court has explicitly determined that land use plan decisions issued by BLM that attempt to authorize a population goal of "zero" by declaring any animal in their protected habitat as "excess" without providing proper documentation that determine how they reached this conclusion, such as has been issued for the Clark Mountain or Chicago Valley wild burros, is unsupported by, and in violation of, current federal law and exceeds the authority granted to the Secretary of the Interior by Congress. Removals of wild burro populations to conform to a fatally flawed land use plan to achieve the illegal number of zero must be remedied via appropriate land use plan amendments, current population inventory, rangeland health data and related issues to determine the appropriate amount of wild burros to be protected and preserved within their federally designated habitat.

Comment ISEGS-28-9: In 2008, a Summary of Conclusions from a document titled, Wild Horses and Burros, was prepared by Robert Dover regarding the joint analysis between BLM and the Energy Commission regarding the impacts of the proposed Ivanpah Electric Generating System. This document can be found online at: http://www.energy.ca.gov/2008publications/CEC-7002008013/FSA/27_Ivanpah%20Horses%20and%20Burros.pdf.

Within it, it clearly states that the remaining wild burros in the Clark Mountain Herd Area are to be protected from harassment or injury by the provisions of the Wild Free-Roaming Horse & Burro Act. The document continues with various analysis and mitigation measures to be put forth to accomplish this aim.

As such, it is apparent the whole of the law is still applicable to the wild burros remaining in the Clark Mountain area and any actions are subject to conformance with that law.

With specific respect to the Clark Mountain Herd Area and the handful of remaining Clark Mountain burros still under pending removal orders issued by the Needles Field Office Record of Decision and Finding of No Significant Impact, CA-690-EA04-27, any attempt to remove these remaining burros via any method, whether through helicopters, other motorized vehicles or alternative methods will be in violation of federal law.

Comment ISEGS-1-49: The Clark Mountain Wild Burro Herd represents a genetically distinct population from a region of Spain that has been historically traced to this area. Wild Horse and Burro enthusiasts are concerned that this herd will be negatively impacted by the project. Many recreationists come to view this herd, and BLM should consider managing a small herd for its unique heritage and viewing opportunities. Cumulative impacts on burros may result from the combination of this proposed project with other current and reasonably foreseeable future land uses, including other solar energy projects.

Comment ISEGS-26-1: Cattle tracks were seen fairly commonly on the fan and in sandy dry washes in February and April, with a few burro tracks as well. Cattle tracks

were more common. On April 5 a single burro was sighted near the small limestone hill on the fan, in creosote-Mojave yucca habitat. Active trails with burro tracks, were present in the area, but not numerous. Another single burro was seen June 7 along Powerline Road in the northern edge of the valley, outside the ISEGS site, within 5 miles of Primm. Dung was common next to Primm, and burro tracks fairly common along the dirt roads here. Both burros seen were very light-colored, whitish-gray.

Response: *The comments regarding other actions associated with burros in the Clark Mountain Herd Management Area are appreciated. The purpose of the EIS was to evaluate the specific impact of the proposed ISEGS project on the burros in the area. However, other management decisions regarding this herd are outside of the scope of this project-specific EIS.*

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APPENDIX A-2
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM
SUMMARY OF PUBLIC AND AGENCY COMMENTS ON SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT (SDEIS) AND AGENCY RESPONSES
JULY 2010

Key to Commenters

Commentor	ID #	Affiliation
Venessa Vasquez	1	Californians for Alternatives to Toxics
John Valenzuela	2	Chairman of San Fernando Band of Mission Indians
Greg Holms	3	Department of Toxic Substances Control
Rick Meyers	4	Concerned Private Citizen
Mass Mailing	5	
Mass Mailing	6	
Steve De Young	7	BrightSource Energy
Lisa T. Belenky	8	Senior Attorney; Center for Biological Diversity
Derek Walker	9	Director, California Climate Initiative
Johanna H. Wald	10	Senior Attorney, National Resources Defense Council
Gloria Smith	11	Senior Attorney, Sierra Club
Laura Wisland	12	Clean Energy Analyst; Union of Concerned Scientists
Michael J. Connor	13	California Director; Western Watersheds Project
Dan Adler	14	California Clean Energy Fund
Lisa T. Belenky	15	Senior Attorney; Center for Biological Diversity
Teresa R. Motley	16	Airport Planning Manager; Department of Aviation
George J. Turnbull	17	Pacific West Region Nation Park Service
David Lamfrom	18	National Parks Conservation Association
Kim Delfino	19	California Program Director; Defenders of Wildlife
Kathleen M. Goforth	20	Manager, Environmental Review Office; USEPA

INTRODUCTION

The Supplemental Draft Environmental Impact Statement (SDEIS) for the Ivanpah Solar Electric Generating System (Ivanpah SEGS) project was published in April 2010, and the public comment period expired on June 1, 2010. The following sections have organized the comments into categories, in order to facilitate technical review, development of responses, and, where needed, revision to the text in the Final EIS.

1.0 GENERAL COMMENTS

1.1 General Support for Project

Comment Supp-5-1: As a member of the *Plumbers, Pipefitters, and Refrigeration Local Union No. 364*, I would like to pledge my support to Brightsource Energy's Ivanpah Solar Energy Project being proposed in San Bernardino County. This project would be very beneficial to the region's economy.

It is imperative that we continue to push for the green development in the Mojave Desert and support renewable energy to make the most of great solar opportunities.

Even with the benefits this project will bring, it seems there is always some obstacle standing in their way. I cannot imagine a better place than the Mojave Desert to build a project of this size because of the amount of inhabited land and the large supply of sunlight in the desert.

The economic and environmental benefits this project could bring to the desert and to the region would be astronomical, and could go a long way towards reversing the economic downturn and surge in unemployment that has hit this area in the past few years.

Please don't let an opportunity like Ivanpah slip away.

Comment Supp-5-2: I am writing this letter to reinforce my support for BrightSource Energy's Solar Electric Generating System.

In terms of economic growth, job creation and local revenue enhancement, this is a rare opportunity that cannot be missed.

Economic indicators suggest that the Ivanpah Solar Project will generate millions of dollars each year in new property tax revenue, which will have a direct and positive impact on our local economy.

Other benefits from this project not to ho unmentioned are the thousand jobs that will be created during construction phase and the outfitted workforce that would be employed once the plant was fully operational.

The High Desert region cannot lose these jobs. This kind of large-scale economic stimulus will set the stage to ensure lasting prosperity for future generations.

Please approve the Ivanpah Solar Energy Generating System.

Comment Supp-6-1: The comments represent a mass mailing all in support of the ISEGS project.

Comment Supp-9-1: We are writing to underscore the importance of the current review by the California Energy Commission ("CEC") and the U.S. Bureau of Land Management ("BLM") of BrightSource Energy's Ivanpah Solar Electric Generating System ("ISEGs"). This project, which would on its own double the solar thermal energy output in the U.S., can be a vital step in building the clean energy infrastructure for the nation that is needed to combat global warming, reduce criteria air emissions and lessen our dependence on the foreign oil. Climate change poses the single greatest threat of our age, and bringing low-carbon solutions like renewable energy to scale, and at a reasonable cost, is imperative.

EDF understands that the review process is ongoing and urges the agencies to work with stakeholders to develop extremely robust and aggressive mitigation measures. Should acceptable and transparent mitigation measures be developed and enacted, EDF considers the approval of the Ivanpah project a priority.

In addition to the boost in solar thermal capacity that this project would bring, it will also be a critical shot in the arm for the local economy, creating jobs that are part of the clean economic future in one of the most economically disadvantaged parts of the country.

EDF believes that developing our clean energy infrastructure is vital for our nation's future. A consensus oriented stakeholder review process can greatly expand our capacity to understand environmental impacts and benefits of the Ivanpah and other similar projects, all of which have significant effects on the surrounding natural resources. With robust and aggressive mitigation measures in place, ultimate approval by BLM and CEC will signal that we can and will achieve our renewable energy goals in an environmentally-responsible manner, while reinvigorating local economies and providing green, sustainable jobs.

Comment Supp-12-1: The Union of Concerned Scientists ("UCS") is writing to express support for the development of clean energy infrastructure, including large-scale solar electricity generation resources, as long as rigorous review and study show that environmental impacts can be sufficiently mitigated or avoided. UCS believes that the development of large-scale solar electricity generation resources, like BrightSource Energy's Ivanpah Solar Electric Generating System ("ISEGs"), should be approved if resource agencies are able to work with stakeholders to successfully develop robust and aggressive mitigation measures.

UCS believes that with proper siting, careful design, comprehensive study, monitoring, and mitigation, solar thermal electricity generation can and must play a significant role in California's electricity system. UCS understands that the review of this project's impacts and appropriate mitigation measures are still ongoing. UCS therefore encourages the stakeholders to work together to develop acceptable, effective, and transparent mitigation measures, in order to allow for the approval of this project.

Comment Supp-14-1: This project is a vital step in building the clean energy infrastructure for the nation that is needed to combat global warming, reduce criteria air emissions and lessen our dependence on the foreign and other fossil fuels that have caused such great harm to the environment. It will also bring desperately-needed green jobs to one of the most economically-blighted areas of the country, providing training and green job experience that will help sustain the local economy for years to come. The mitigated project design BrightSource proposed in February 2010 strikes an appropriate balance, providing a strongly positive net environmental benefit while minimizing any negative impacts, and we urge you to approve that design for the project.

Comment Supp-14-2: Concerns have been raised regarding the location of the site, particularly with respect to desert tortoise habitat. We strongly support robust mitigation measures to ensure that there is a net benefit to desert tortoise, and that the overall environmental impact of this project is positive. With robust mitigation efforts in place, we feel that on balance, the benefits of this project far outweigh any negative impacts. It is very important that we do not delay the critically-important progress of renewable energy, which is needed to protect the broader desert and its species from the devastating effects of climate change. It is equally important that the lessons learned- not just in siting and environmental assessment, but in best construction and operation practices- are captured so that the progress of renewable energy is accompanied by continuous environmental improvement in all of its aspects. We are dedicated to helping ensure that the net benefit of renewable energy increases through reduction in negative environmental impacts to the minimum necessary.

BrightSource's Ivanpah project represents a key milestone for the nation's renewable energy future. The BLM and CEC's approval of the ISEGS project will illustrate the importance of this and similar projects to meeting the climate change challenge. It will also signal that we can and will achieve our renewable energy goals in an environmentally responsible manner, while reinvigorating local economies and providing green, sustainable jobs. We urge you to promptly approve this project.

Response: *The comments in support of the proposed project are appreciated. These comments were considered in the selection of the preferred alternative in the FEIS, and will be considered in the decision whether or not to issue a right-of-way grant in the Record of Decision.*

2.0 ALTERNATIVES

2.1 Comments on Location of Proposed Project on Undeveloped Land

Comment Supp-13-1: The proposed power plant project would be located on relatively undisturbed public lands in California that are habitat for the state and federally listed desert tortoise, and that provide habitat for rare plant species and communities. In the initial Draft EIS, the BLM considered only two alternatives, the proposed action and no action. The Supplemental Draft EIS (SDEIS) analyzes two additional alternatives to the proposed action; a "Mitigated Ivanpah 3 Alternative" and a "Modified I-15 Alternative". These two additional alternatives are for projects with slightly reduced footprints (about 3,564 acres) compared to the original proposed action (4,064 acres). The Mitigated Ivanpah 3 Alternative would be located entirely within the same property boundaries as the proposed project. In theModified I-15 Alternative the Ivanpah 3 unit would be moved from north end of the project to south of the project closer to Interstate-15.

In the DEIS and now in the SDEIS, the BLM has failed to consider and analyze alternatives that would allow the project to proceed but would avoid impacts to desert tortoise, rare plants and other scarce and sensitive resources. The two alternatives reviewed in the SDEIS will have similar significant direct, indirect and cumulative impacts on desert tortoises, rare plants, and visual resources as the proposed action. The BLM failed to consider any alternatives that would avoid these resources but would allow the project to proceed. The BLM has failed to take NEPA's requisite hard look at the environmental effects of each alternative. Accordingly, the BLM should consider issuing a new supplemental NEPA document prior to developing a final EIS.

Comment Supp-8-1: While the Supplemental DEIS provides two additional alternatives – the reduced acreage (or "Mitigated Ivanpah 3"), and the I-15 alternative, the Supplemental DEIS still shows that the proposed plan amendment and right-of-way application should be denied because the proposed project will result in significant impacts to a healthy breeding population of desert tortoise in an area essential to the recovery of the species. Alternative siting on disturbed lands or lands that have few rare species conflicts, which the BLM has still failed to adequately address in the Supplemental DEIS, would significantly reduce the impacts to this listed and still declining species, its occupied habitat, and other special status species including rare plants and desert bighorn sheep. The Center urges the BLM to adequately address these and other issues detailed below and re-circulate another Supplemental DEIS or a revised DEIS for public review and comment.

Response: *BLM appreciates the concerns raised regarding the potential authorization of solar energy developments on previously undeveloped sites.*

BLM, the Department of Energy (DOE), and the State of California have all identified commercial-scale solar energy as an integral component of a future energy system which is sustainable, while reducing the emission of greenhouse gases. BLM acknowledges that locating commercial-scale solar energy facilities only on previously disturbed sites (public or private) would be desirable, and is following the developments

associated with the recent initiative between EPA and the National Renewable Energy Laboratory (NREL) to encourage this type of renewable energy development. However, even with new federal initiatives to evaluate development of previously contaminated sites, BLM is still mandated to consider ROW applications on undisturbed public land. Also, given the large land area requirements and difficulty in acquisition of small land parcels, large-scale development on previously contaminated lands is potentially not feasible in the same time frame as that of the proposed project. Therefore, to access the innumerable benefits of solar energy, sites must be identified which meet a variety of technical and economic criteria (such as high solarity and particular slope and grade), and which also minimize impacts to environmental resources. Ultimately, this process requires consideration of sites that are either undeveloped, or which have limited development.

While BLM agrees that biological resources would be impacted in the proposed project, Mitigated Ivanpah 3 Alternative, and Modified I-15 Alternative areas, we also acknowledge the long history of human use and development of the Ivanpah Valley area, and the project site. The project site itself is currently the location of a grazing lease, and is traversed by transmission lines, a natural gas pipeline, and roads. The site is directly adjacent to a golf course. Within a few miles of the project site are an interstate highway, casino development, a natural gas power plant, and waste disposal facilities for the Molycorp mine. As part of its mandate to balance multiple use of public lands with environmental protection, BLM must consider all of these issues, and they are all presented as part of the analysis in the EIS.

2.2 Comments on the Range of Alternatives Considered

Comment Supp 13-15: In summary, the BLM has failed to analyze a reasonable range of alternatives in the SDEIS and DEIS, has failed to analyze alternatives that would avoid significant direct, indirect and cumulative effects on desert tortoise, special status species, rare plants, and visual resources, and that would comply with the governing CDCA Plan, and has failed to take a hard look at the environmental impacts of the alternatives. The BLM should address these deficiencies in a second supplemental DEIS.

Comment Supp-19-1: The Ivanpah SEGS is a sizable project located in the Northern Ivanpah Valley which has increased from a 3,400-acre footprint to a 4,065 acre footprint that includes three solar concentrating thermal power plants, associated buildings, roads, a gas and water pipeline, new groundwater pumping, and a reconductored transmission line. It could entail loss of habitat and displacement for many wildlife species, including the state and federally threatened desert tortoise, special-status mammals and birds, and numerous rare plant species. The Final Staff Assessment/Draft Environmental Impact statement ("FSA/DEIS") for this project only analyzed the "project" and "no-project" alternatives under the National Environmental Policy Act ("NEPA"). Although the DSEIS analyzes two alternatives in depth – the Mitigated Ivanpah 3 and Modified I-15 alternatives – it still falls far short of NEPA's requirement to include all reasonable alternatives, which must be rigorously explored

and objectively evaluated, as well as to include reasonable alternatives not necessarily within the jurisdiction of the lead agency. 50 C.F.R. § 1502.14(a)(c).

Comment Supp-19-3: Second, BLM itself alludes to the fact that the project's impacts may be greater than originally thought and the mitigation measures potentially inadequate: "the public comments on the DEIS provided BLM with additional information regarding the presence of resources and expected effectiveness of mitigation measures associated with the northern 433-acre portion of the proposed project area." DSEIS, page 1. Indeed, the additional information on resources and expected effectiveness of mitigation on the northern 433 acres should have triggered not only a discussion of reconfiguration alternatives, but of site alternatives as well. Site alternatives are measures that may result in avoiding or reducing adverse impacts from a project and should be discussed at every step of the NEPA analysis.

Comment Supp-7-3: The SDEIS and DEIS together more than meet the requirement for federal agencies to consider all reasonable alternatives to a proposed action. See, 40 C.F.R. § 1502.14(a); 43 C.F.R. § 46.420(c); Council on Environmental Quality's 40 Frequently Asked Questions (40 FAQs), 46 Fed. Reg. 18026, #1a, 1b (1981); *see also Westlands Water Dist. v. U.S. Dep't of Interior*, 376 F.3d 853, 868 (9th Cir. 2004) *quoting Morongo Band of Mission Indians v. Fed. Aviation Admin.*, 161 F.3d 569, 575 (9th Cir. 1998). With these two documents the BLM has rigorously explored and objectively evaluated all reasonable alternatives. NEPA requires no more. 43 C.F.R. § 46.420(c); *see generally* BLM Handbook, § 6.6. Under the rule of reason, the range of alternatives included in the DEIS and SDEIS is more than adequate, and the alternatives considered are reasonable when compared to the purpose and need of the proposed federal action.

Response: *In Section 4 of the DEIS, BLM conducted a screening-level evaluation of 23 potential alternatives to the proposed action, including alternative locations, configurations, and technologies, including several alternatives (Private Land, Distributed Generation) that are not within BLM's scope of authority. The evaluation of several of these alternatives included not only a determination of their technical and economic feasibility, but a resource-by-resource evaluation of their potential impacts. Although only the proposed action and No Action Alternative were carried into the resource sections for a more detailed analysis, the evaluation of potential alternatives to identify those which were technical and economically feasible, and which could have a reduced magnitude of environmental impacts, exceeded the level of analysis usually included in a screening-level analysis.*

Following review of the public comments, BLM reviewed the rationale presented in Section 4 of the DEIS for eliminating these 23 alternatives from detailed evaluation, and, for 21 of them, concluded that the rationale for their elimination from detailed analysis was explicitly provided, and was sound. However, the agency determined that two alternatives which had been analyzed but eliminated from further evaluation, the I-15 Alternative and the Reduced Acreage Alternative, were potentially feasible, and therefore merited more detailed evaluation. As a result, BLM published the SDEIS on April 16. The SDEIS presented a detailed, resource-by-resource evaluation of a version

of the I-15 Alternative (called the Modified I-15 Alternative), and a reduced acreage alternative (called the Mitigated Ivanpah 3 Alternative).

Finally, in the review of the public comments, BLM noted two additional alternatives (Ivanpah Playa and Phased Approval) that were not originally included in the screening analysis in Section 4 of the DEIS. Because both of these alternatives recommended in the public comments have merit, they have been added to the revised screening analysis in Section 3 of the FEIS.

2.3 Comments on Other Potential Alternatives

Private Land:

Comment Supp-19-1: A *full* spectrum of alternatives for the Ivanpah project must include at least one private land site alternative, as suggested by Defenders in comments submitted on the FSA/DEIS. Unfortunately, the BLM summarily dismissed the Harper Lake Alternative, the only private land site alternative identified in the FSA/DEIS. *See* FSA/DEIS, page 4-20. Although the stated purpose of the DSEIS is to respond to public comments regarding the "presence of resources and expected effectiveness of mitigation measures associated with the northern 433-acre portion of the proposed project area" (*see* DSEIS, page 1), BLM inexplicably fails to include even a single private land site alternative.

Comment Supp-19-2: The DEIS failed to analyze a reasonable range of alternatives, narrowly defining the project's objectives in such a way as to preclude assessment of many viable alternatives, including those on private and degraded land. The DSEIS amends the purpose and need statement by removing the 400 MW capacity language. DSEIS, page 7. This change is necessary to facilitate the two reconfiguration alternatives and any other alternatives requiring a reduction in generating capacity. However, BLM continues to constrain the project by including development of renewable energy resources on public lands as part of the need for the project. DSEIS, page 8. This concept directly contradicts California's Renewable Energy Transmission Initiative's stated goal of developing renewable energy resources on private degraded lands (see RETI Phase 2A Final Report, page 2-33).

BLM must evaluate a reasonable range of alternatives, including a private land site alternative. 50 C.F.R. § 1502.14(a). The discussion of alternatives need not be exhaustive, but it must "be sufficient to demonstrate reasoned decision-making." *Fritiofson v. Alexander,* 772 F.2d 1225, 1236 (5th Cir. 1985); *see also C.A.R.E Now, Inc. v. F.A.A.,* 844 F.2d 1569, 1574 (11th Cir. 1988) (stating that the court must assess whether the agency has made a "reasoned choice"). Although a private land site alternative would not be within the jurisdiction of the BLM, section 1502.14 of the NEPA Guidelines requires the EIS to examine all reasonable alternatives, including those outside the jurisdiction of the BLM. *See* 50 C.F.R. § 1502.14(a). In determining the scope of alternatives to be considered, the emphasis is on what is "reasonable" rather than on whether the proponent or applicant prefers, or is itself capable of carrying out, a particular alternative. NEPA's 40 Most Asked Questions, 2a. The FSA/DEIS identified

the Harpers Lake private land option, which "had sufficient land for a 400 MW facility with the configuration of the proposed project," though it was rejected by the proponent because "one of the major land owners at the site requested too much money." FSA/DEIS, page 4-20. This dismissal is unacceptable and arbitrary absent a full analysis and determination of feasibility.

BLM cannot make a reasoned choice without analyzing at least one private land site alternative.
First, it is the stated goal of RETI, a California initiative charged with identifying sites for renewable energy facilities and transmission lines, to prioritize renewable energy development on private land. RETI recently issued the following statement:

RETI stakeholders agree that utilizing disturbed private lands close to existing infrastructure for renewable energy development should be a priority for the state. County governments and state agencies are in the best position to develop mechanisms to consolidate the ownership of extensively-parcelized lands that have excellent renewable resource potential. For this reason, the RETI Phase 2A Final Report includes a formal recommendation that the California Energy Commission, in conjunction with other state and federal agencies, counties and the renewable energy industry, develop and implement a strategy for consolidating ownership of disturbed or degraded private lands for renewable energy development on an expedited basis (RETI Phase 2A Final Report, page 2-33).

Comment Supp-19-9: The two alternatives identified are not sufficient to satisfy NEPA's requirements. A private land site alternative is absolutely necessary given the extensive impacts to biological resources resulting from locating the project on public lands, the RETI policy favoring private lands, the uncertainty of mitigation requirements and the cumulative impacts of renewable energy projects on public lands in the region.

Previously Disturbed/Developed Sites:

Comment Supp-20-7: For this and future projects, EPA continues to recommend the identification of locations that have been previously disturbed or contaminated. The FEIS should discuss any methods or tools ELM has used to identify and compare locations for siting renewable energy facilities, and to ascertain whether or not any disturbed sites are available that would be suitable for the proposed Project. For example, the EPA's Re-Powering Amen.ca initiative works to identify disturbed and contaminated lands appropriate for renewable energy development. For more information on that initiative, visit http://www.epa.gov/oswercpal.

Recommendations:

- EPA strongly encourages BLM to promote the siting of renewable energy projects on disturbed, degraded and contaminated sites, before considering large tracts of undisturbed public lands.

- The FEIS should include information regarding all criteria used to evaluate the Project site and alternatives.

Comment Supp-8-4: Moreover, additional opportunities are emerging every day for siting large-scale industrial renewable energy projects on previously damaged or disturbed lands. Indeed, approximately 30,000 acres of former agricultural lands in the Westlands Water District may soon be available to provide 5,000 MW of utility-scale solar development.

Comment Supp-18-1: NPCA recognizes that the addendum has been offered in order to limit the impact to rare and sensitive plant species found on the site, in order to fully mitigated the direct, indirect, and cumulative to biological resources. The applicant's recent proposal (2-11-2010) has proposed that the total footprint of the site to be reduced by 491 acres, that Ivanpah 2 and 3 realign to minimize damage to rare plant species, that Ivanpah 3 reduce the number of solar towers from 3 to 1, that the total number of heilostats to be reduced by 40,500, and that the total energy production potential be reduced from 400 MW to 370 MW.

NPCA agrees that impacts to rare and sensitive plants should be limited and fully mitigated. We continue to encourage realignment or relocation to limit adverse impacts to desert tortoise and other sensitive species, and to protect or limit and mitigate impacts to, Mojave National Preserve's night-sky resources and viewshed. We remain concerned about the cumulative impacts of this potential project and proposed adjacent development in the Ivanpah Valley. For these reasons, NPCA continues to advocate for alternative locations for this project, and our organization suggests that the project be preferentially sited on disturbed lands in one of California's BLM proposed Solar Energy Study Areas, or on private distributed land.

Distributed Generation:

Comment Supp-8-4: As the testimony submitted in the CEC process and provided to the BLM with the Center's comments on the DEIS shows, a distributed solar energy alternative is also a feasible alternative. Recent data and information also shows that a distributed solar energy alternative would be comparable in terms of cost and capacity factor —indeed it may be less costly than the proposed project. *See* RETI 2B Report (attached). There are many opportunities for development of renewable energy in closer proximity to urban load center where there are areas appropriately zoned for industrial development.

Comment Supp-8-5: Alternative renewable energy projects are being proposed, built, and brought on line in many areas beyond of the California desert as well. While clearly some solar development will go forward in the California desert, the Ivanpah Valley, should not bear a disproportionate burden of the impacts of these industrial-scale solar facilities when other feasible alternatives exist and have not been adequately explored. Importantly, analyzing a distributed PV alternative to this proposed project does not preclude cost-effective central station (industrial) solar projects being sited in any way.

Indeed, proposed projects that are appropriately sited on disturbed or degraded lands served by existing transmission lines may very well be comparable to distributed PV when looked at in a robust alternatives analysis. The DEIS discussion of this alternative was inaccurate and inadequate and the Supplemental DEIS still fails to include an alternative of distributed solar.

Ivanpah Playa:

Comment Supp-13-2: The NEPA implementing regulations specify that NEPA documents must analyze a full range of alternatives. The consideration of alternatives "is the heart of the environmental impact statement." 40 C.F.R. § 1502.14. NEPA requires agencies to "Use the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment." (40 C.F.R. § 1500.2)

In the original DEIS, the BLM considered only two alternatives, granting the right-of-way (the "proposed action") and not granting the right-of-way ("no action"). In our comment letter on the DEIS we had requested that the BLM to consider locating the project on Ivanpah Dry Lake bed. This obvious and reasonable alternative site location was raised at public meetings, was proposed by the Sierra Club in its June 22, 2009 letter, and was referenced by CDFG in its October 27, 2009 letter. The NEPA requires agencies to "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." This alternative should have been considered in the SDEIS.

Comment Supp-8-3: While the Supplemental DEIS considers two additional alternatives it has ignored other feasible alternatives including off site alternatives and an alternative plan amendment that would consider this area for protection as an ACEC or an addition to the existing DWMA. Such alternatives are clearly feasible. Indeed, other recent draft EISs for solar projects included discussion of an alternate plan amendment to protect the area of a proposed project by making it unavailable for future solar development. DEIS for the SES Two Solar Project in Imperial County at B.2-18 (framed as one of several "no action" alternatives although it includes a plan amendment which is an action); DEIS for the Ridgecrest Solar Power Project at B.2-16 (same); DEIS for the Palen Solar Power Project at B.2-18 (same); DEIS for the Genesis Solar Energy Project at B.1-30 (same).

Although both the reduced footprint alternative and the I-15 alternative would reduce some on-site impacts to rare species, other alternatives are clearly available and feasible that would further and more significantly reduce the impacts and these alternatives were previously suggested to the BLM but are still not addressed in the SDEIS. Other configurations were not considered including relocating the project adjacent to I-15 on Ivanpah dry lake or a portion thereof closer to Primm, which is likely to significantly reduce or eliminate impacts to rare plant and tortoise habitat (pending surveys).

Comment Supp-13-12: The NEMO Plan set the goal for special status species as "Populations and their habitats are sufficiently distributed to prevent the need for listing" (NEMO Plan at 2-6). The SDEIS provides too little analysis of impacts, fails to discuss of alternatives that would avoid these impacts, and provides inadequate information about the proposed mitigation strategies and how these will fulfill the objectives laid out in NEMO. Siting the project on the dry lake bed would have avoided many impacts to rare plants.

Phased Approval:

Comment Supp-8-3: Other feasible alternatives include a phased alternative that could to minimize impacts of the project if unforeseen events occur during construction for example or if the project fails to perform as hoped by the applicant. *See* FSA/DEIS at 2-5 (Applicant's Objectives). Because the technology at issue has not previously been constructed at "commercial-scale" phasing is particularly appropriate. For example, if the first phase demonstrates that this technology for some reason is not technically or economically viable at a commercial-scale project, then changes could be made before approval of any subsequent phases and less environmental damage will occur. The approval could be phased and the applicant given a set of targets to meet for energy production as well as targets for mitigation success for the first phase before additional phases might be approved. A phased alternative would also, most importantly, provide the applicant additional time to find more appropriate sites for any remaining phases of the project.

Response: *BLM has reviewed and evaluated all public comments received on the SDEIS, and also evaluated information received through the CEC hearing process. Based on this information, BLM reviewed the identification, screening, and analysis of alternatives that was presented in the DEIS. As a result of this review, BLM determined that two alternatives which had been screened and eliminated from further evaluation in Section 4 of the DEIS (the I-15 Alternative and the Reduced Acreage Alternative) merited more detailed evaluation. As a result, BLM published the SDEIS on April 16. The SDEIS presented a detailed, resource-by-resource evaluation of a version of the I-15 Alternative (called the Modified I-15 Alternative), and a reduced acreage alternative (called the Mitigated Ivanpah 3 Alternative).*

In addition, BLM evaluated the 21 other alternatives, including several (Private Land, Distributed Generation), that are not within BLM's scope of authority. Following the review of the public comments, BLM reviewed the rationale presented in the DEIS for eliminating the 21 other alternatives from detailed evaluation, including several proposed in the public comments, and concluded that the rationale for their elimination was explicitly provided, and was sound. In some cases, such as Distributed Generation, additional information has been provided.

Finally, BLM noted that the public comments identified two alternatives (Ivanpah Playa and Phased Approval) that were not included in the screening analysis in Section 4 of the DEIS. Because both of these alternatives recommended in the public comments

have merit, they have been added to the revised screening analysis in Section 3 of the FEIS.

2.4 Comments on the Alternatives Identification and Screening Process

Comment Supp-20-2: The DEIS eliminated certain alternatives because they required land outside of the applied-for ROW. The SDEIS includes the Modified 1-15 alternative, which proposes locating a portion of the Project outside of the ROW. The SDEIS indicates that the evaluation concluded that the Modified I-15 Alternative would accomplish all of the objectives of the purpose and need, including meeting power demand, as well as federal and state objectives for renewable energy development (at pg. 2). The FEIS should discuss how an alternative that extends outside of the applied for ROW could meet the purpose and need, given that this was used as a rationale in the DEIS to eliminate certain alternatives. The discussion should cite any regulation or BLM policy that limits the evaluation of alternatives outside of the right of way (ROW) for which an application has been received.

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.

Recommendations:

- Include supporting documentation and additional discussion on BLM's rationale for the elimination of off-site alternatives from further consideration under NEPA.
- The FEIS should discuss how an alternative that includes a portion outside of the applied-for ROW could meet the purpose and need given this was used as a rationale in the DEIS to eliminate certain alternatives.

Comment Supp-20-3: EPA recommends that the FEIS present the environmental impacts of all alternatives considered in comparative form, sharply defining the issues and providing a clear basis for choice among options for the decision maker and the public (40 CFR 1502.14). A rigorous comparison of the merits of each alternative would better achieve the purposes of NEPA.

From our review of the SDEIS, it is apparent that sufficient survey information was not available to adequately compare alternatives. The SDEIS concludes that "although impacts to plant species may also be different between the two alternatives, these impacts cannot be determined without site-specific surveys on the Modified I-IS Alternative location" (at pg. 197). Similarly, the SDEIS estimates that tortoise impacts from the Modified 1-15 Alternative are "likely also reduced~' as compared to the Mitigated Ivanpah 3 Alternative (at pg. 200). Also, while the Modified 1-15 Alternative would eliminate the need for grading 170 acres in the proposed Project footprint, the SDEIS indicates that the impact of the alternative on active drainage pathways, which are designated as Waters of the State, cannot be fully evaluated without detailed

mapping and evaluation of the revised Ivanpah Unit 3 location (at pg. 159). Details are also lacking to compare and contrast alternatives for impacts to groundwater, stormwater flows, and downstream resources as well as other resource areas discussed.

Recommendations:

- The FEIS should clearly describe the rationale used to determine whether impacts of an alternative are significant or not. Thresholds of significance should be determined by considering the context and intensity of an action and its effects (40 CFR 1508.27).
- The FEIS should present environmental impacts from all alternatives considered in comparative form, sharply defining the issues and providing a clear basis for choice among options for the decision maker and the public (40 CFR 1502.14).
- The FEIS should fully justify the elimination of any alternatives that would result in fewer environmental impacts than the preferred alternative and should clearly explain why certain alternatives are not fully analyzed, including a description of the criteria used to eliminate potential alternatives from further study.
- The FEIS should fully describe measures to avoid washes and placement of heliostats in drainages for all alternatives evaluated.

Comment Supp-20-4: The SDEIS indicates that because the project proponent "did not apply for nor did it hold third party sales contracts for reduced project output at the time of the DEIS, the Reduced Acreage Alternative was not developed and evaluated in detail" (at pg. 4). We commend BLM tor reconsidering whether the proposed Condition of Certification BIO-18 could result in equivalent impact reductions as the Reduced Acreage Alternative (at pg. 5).As recommended in our DEIS comments, we recommend that the SDEIS include a full analysis of the Reduced Acreage alternative to provide a comparison of environmental and economic impacts to inform decision making.

Recommendation:

- The FEIS should discuss the changes that have resulted since the DEIS was issued which has resulted in the ability of the project proponent to consider a reduced project output.

Comment Supp-20-5: In light of the recent decision to separate CEC's and BLM's environmental review processes, the DEIS should discuss the resolution procedure should BLM' s FEIS present a preferred alternative that is different than CEC approves through its process.

Recommendation:

- Clarify in the FEIS how BLM's and CEC's now separated alternative selection processes will be reconciled.

Response:

CEQ regulations at Section 1502.14(a) acknowledge that the alternatives analysis needs to be a multi-step process, with some alternatives being eliminated from further consideration without the need for detailed study. The regulation requires that these alternatives be identified and evaluated, and that the rationale for their elimination be provided – however, it does not require detailed evaluation of alternatives that have not been identified as reasonable alternatives. The identification and preliminary screening evaluation of alternatives in Section 4 of the DEIS is consistent with this requirement. The text on Pages 4-9 through 4-11 generally describes some of the technological and jurisdictional rationale for why some classes of alternatives were determined to not be reasonable or feasible alternatives to meet the purpose and need for the proposed project. Then, instead of simply dismissing these alternatives, the DEIS goes on to describe and present a resource-by-resource summary of the associated impacts of many of these alternatives, and ends each subsection with a paragraph titled "Rationale for Elimination". Although these alternatives were not carried into the resource sections for detailed analysis, Section 3 does provide enough information, even on those alternatives determined not to be reasonable, to explain why the alternative was not carried forward for more detailed evaluation, and to allow a comparison of impacts between the alternative and the proposed project. Then, for the alternatives retained for further analysis, each subsection in Section 4 includes a comparative analysis among the alternatives. These comparisons are repeated in the overall summary of the EIS.

2.5 Recommendations for Alternative to be Selected

In Favor of the Mitigated Ivanpah 3 Alternative:

Comment Supp-7-1: The Applicant strongly supports a robust analysis under NEPA and all other relevant laws and policies for renewable energy projects, and appreciates the BLM's inclusion and thorough review of the two additional alternatives presented in the SDEIS. To be clear, while NEPA requires the BLM to consider a range of reasonable alternatives, the Applicant is prepared to build only one of these alternatives- the Mitigated Ivanpah 3 Alternative, which is described and fully analyzed in the SDEIS. The Applicant believes that the Mitigated Ivanpah 3 Alternative best meets federal and state objectives for renewable energy, including providing the most favorable balance of all environmental
impacts. Moreover, while the alternatives included in the DEIS and SDEIS provide a broad range of alternatives needed for an adequate NEPA analysis, there are financial, technical and procedural impediments to implementing any alternative other than the Mitigated Ivanpah 3 Alternative that would prevent other alternatives from meeting the ARRA deadlines, and the Secretary's goals for the fast-track projects, for the reasons described in the comments below. The Applicant therefore requests selection of the Mitigated Ivanpah 3 Alternative so that ISEGS can proceed to contribute towards the nation's renewable energy infrastructure, and provide the climate protection, green jobs and new green economy sought by federal and state policy alike.

Comment Supp-7-2: The Applicant has participated extensively in the CEC process and has established, through its comments, evidence, and testimony, that the project satisfies the applicable State of California requirements and should be permitted in the form of the Mitigated Ivanpah 3 Alternative, as recommended by CEC staff.2 Through the Mitigated Ivanpah 3 Alternative, the Applicant has taken additional steps to avoid and minimize the impacts of the project, further strengthening the grounds for timely approval of the project. The informational record supporting approval of the Mitigated Ivanpah 3 Alternative is robust and clearly supports selection of the Mitigated Ivanpah 3 Alternative as the preferred alternative in the Final EIS. The Applicant believes that the entire record, including the FEIS, will provide robust support for selection of the Mitigated Ivanpah 3 Alternative in the BLM's Record of Decision (ROD).

Comment Supp-7-3: The Applicant appreciates the additional efforts by the BLM to develop the SDEIS, and thereby provide a more informative and robust environmental review by adding to the range of alternatives available to the BLM for consideration. The alternatives analysis, as augmented by the SDEIS, properly and fully considers the following alternatives: (1) the Mitigated Ivanpah 3 Alternative, which is now the Applicant's preferred Project; (2) the larger Ivanpah project that had been the Applicant's proposed project prior to recommending a project with reduced size and environmental impact; (3) the Modified I-15 Alternative; and (4) the No Action Alternative. These comments provide further discussion of the Mitigated Ivanpah 3 Alternative and the Modified I-15 Alternative.

A. The Mitigated Ivanpah 3 Alternative.

The Mitigated Ivanpah 3 Alternative is the sole alternative that can be commenced in time to meet ARRA deadlines and fulfill California and national renewable energy objectives. Moreover, the record clearly establishes that none of the other alternatives are environmentally superior to the Mitigated Ivanpah 3 Alternative. The staff of the CEC, after completion of hearings and briefings, recommended approval of the Mitigated Ivanpah 3 Alternative. The Applicant strongly believes that, on consideration of the record, the federal government should reach the same conclusion.

The Mitigated Ivanpah 3 Alternative, an enhanced mitigation proposal, significantly reduces the project's footprint and minimizes potential negative environmental impacts. Specifically, the Mitigated Ivanpah 3 Alternative would:

- Reduce the footprint of the third Ivanpah plant by 23 percent, avoiding the area identified by environmental groups during the CEC proceedings and the DEIS public comment period as posing the greatest concern.
- Reduce the footprint of the overall Ivanpah project by about 12 percent
- Reduce expected desert tortoise relocations by approximately 15 percent (based on previous protocol surveys of the project site; the actual number will depend on where tortoises are at the time they are relocated)
- Avoid the area identified as having the highest rare plant density

- Reduce the number of towers at the third Ivanpah plant from five to one; reduce overall number of towers at the Ivanpah project from seven to three
- Reduce the potential maximum number of heliostats by about 40,000
- Avoid the area that would have required the most grading and large rock removal in the solar fields
- Leave the largest natural stormwater features (washes) in the northern portion of the site intact

Although the Mitigated Ivanpah 3 Alternative would reduce the total capacity of the ISEGS project to approximately 392 MW (which, in the long run constitute, a negative environmental impact to the extent that it decreases peak renewable energy production and lessens the ISEGS' displacement of fossil-fueled generation), the overall balance of the Mitigated Ivanpah 3 Alternative's positive and negative impacts relative to any other alternative make it the superior choice. The Mitigated Ivanpah 3 Alternative, as indicated previously in these comments, is also the only alternative that could be commenced in time both to meet ARRA deadlines and to fulfill state and federal policy objectives for renewable energy projects identified by the Secretary for priority review. Commencement of construction requires timely closing of project financing, in order to obtain the funds needed to undertake the requisite construction activities. Successful project financing requires that the project be economic, considering project costs and revenue. Project costs and revenues, in turn, depend on a web of power purchase agreements (PPAs) approved by the California Public Utilities Commission (CPUC); construction, operational and closure costs; and eligibility for and receipt of benefits available to renewable energy projects, including the federal financial benefits provided under ARRA, which are available only to projects commencing construction this year.

Although the construction changes between the Mitigated Ivanpah 3 Alternative and the originally proposed alternative are extensive, the change order costs are mitigated to some degree by the Mitigated Ivanpah 3 Alternative's use of land areas already wellstudied and planned for in terms of detailed construction, operation, stormwater management and other factors required for timely and efficient implementation, which require far more data and analysis than the level required for comparative alternative analysis. The avoidance of areas of rougher terrain that would have required comparatively more land work mitigates the cost of implementing the Mitigated Ivanpah 3 Alternative relative to the original proposed alternative. In addition to changes in construction costs, the reduction in size of the ISEGS understandably changes the output of the project, and thus the economies of scale (costs of construction relative to production). The reduction in size of the ISEGS also reduces the overall revenues of the project. Increased costs and decreased revenues, in addition to perceived risk of timely completion of the ISEGS, increases the difficulty of obtaining the required project financing under existing PPAs. Due to careful efforts by the Applicant in crafting the Mitigated Ivanpah 3 Alternative so as to reduce environmental impacts but retain sufficient project viability in the face of increased costs and reduced revenue, the corresponding changes to the PPAs required to procure the necessary project financing are comparatively minimal, and can be completed in time for closing of project financing and commencement of construction in 2010.

Commencement of construction in 2010 is itself a prerequisite to project financing. The Department of Energy's conditional commitment to a $1.37 billion loan guarantee for the ISEGS, the first granted to a utility-scale solar project, and other project financing required to build the ISEGS are all dependent on the ISEGS qualifying for a grant in lieu of the Investment Tax Credit (ITC). The ITC provides a credit against tax liabilities for those who invest in solar, including projects such as the ISEGS. Very few entities will have sufficient tax liability to make tax credits a meaningful stimulus to utility-scale solar investment. As a response to this issue, ARRA allows conversion of the ITC from a tax credit to a grant, provided that the solar projects actually commence construction in 2010. Under guidance issued by the Treasury, which is responsible for implementing the ITC grant program, commencement of construction can be demonstrated either through "physical work of a significant nature" on the project or expenditure of five percent (5%) of the total project costs (this latter factor is referred to as a "safe harbor"). For ISEGS, the requirements must be met for each of the three units that comprise the project, and closure of project financing will be necessary to undertake the activities or make the expenditures necessary to meet the ITC grant requirements. Only the Mitigated Ivanpah 3 Alternative, for the reasons discussed above, can achieve project financing in time to allow the Applicant to meet the ITC grant requirements. Project financing and the ITC grant are thus reciprocal requirements—both must be in place to allow the ISEGS to go forward, and only the Mitigated Ivanpah 3 Alternative can provide both at this stage.

The Mitigated Ivanpah 3 Alternative provides the best balance of environmental benefits and impacts; although it will have reduced renewable energy and climate change benefits relative to the originally-proposed alternative, it will also have reduced impacts on desert tortoise and rare plants. It is also technically and financially feasible, and can be implemented in time to serve federal and state policy objectives. It has been recommended for approval by the staff of the CEC after an exceptionally thorough review process, which included extensive hearings and briefs. For all of these reasons, it is the alternative that should be selected.

Opposition to the Mitigated Ivanpah 3 Alternative:

Comment Supp-11-12: The Reduced Ivanpah 3 Alternative Is Essentially Indistinguishable From the Original Application in terms of Desert Tortoise Impacts

In response to the Sierra Club's proposal, the Applicant proposed its Reduced/Mitigated Ivanpah 3, which shaves off 433 acres from the northernmost portion of the originally proposed Ivanpah 3 unit. The idea was simply to shrink the size of Ivanpah 3, thereby reducing generating capacity, without adequately addressing habitat fragmentation and desert tortoise and other biological resource impacts.

Comment Supp-11-13: A Reduced Ivanpah 3 Would Entail An Unacceptable Amount of Habitat Fragmentation and Tortoise Translocation

As the Energy Commission's analysis showed, this option does nothing to mitigate the significant impacts on desert tortoise as compared to the original plan. (FSA Addendum at 4-4, 7.) And it bears repeating that lands adjacent to the interstate are less suitable for desert tortoise:

- **Applicant:** "[w]hile all of the Ivanpah SEGS project area is within tortoise habitat, most biologists agree that Ivanpah 3 supports relatively better habitat than areas to the south closer to Interstate 15. This assessment is based on relatively greater frequency with which tortoise sign is observed, increased vegetative diversity and density, greater number of ephemeral washes in the northern portion of the project area and the greater number of tortoises found during spring survey." (Ex. 88, at 3-2.)

- **Scott Cashen**: It is "pretty clear that relocating the project on the lands adjacent to the freeway would have less of an impact on the desert tortoise population than the currently proposed location." (Tr. at p. 311 (Jan. 12, 2010).)

- **Ms. Sanders with the Energy Commission**: I-15 creates a mortality hazard and increases habitat fragmentation. (SEIS 127.)

The applicant ignored the fact that its reduced Ivanpah 3 would result in essentially the same level of habitat fragmentation and tortoise translocation as the original Project, while the Modified I-15 alternative reduces both.

Comment Supp-11-16: Mitigated Ivanpah 3 Does Not Address the Threats to Tortoise and Other Desert Species Caused by Habitat Fragmentation

Reducing Ivanpah 3 does nothing to lessen habitat fragmentation in the Ivanpah Valley. However, the Modified I-15 alternative would "reduce local habitat fragmentation, providing larger, contiguous areas of tortoise habitat." (SEIS 127.) Energy Commission staff identified fragmentation, in addition to habitat loss and disturbance, as a substantial direct impact to desert tortoise (Ex. 300 at p. 6.2-51.) In addition:

- **Ms. Chainey-Davis, Energy Commission:** "We go back to the idea of protecting large blocks of habitat with species, large blocks that have and will have the integrity and the size and the connectivity to be sustainable. (Tr. at p. 153 (Jan. 14, 2010).)

- **Scott Cashen:** "And I think we also seem to agree that there are ecological principles, such as fragmentation and maintenance of large blocks of habitat that are important to maintaining intact ecosystems. And it seems that we also agree that the studies of desert tortoises have shown that roads are a sink for tortoises, and that they have an adverse effect. And if I'm wrong, please respond. Thank you. (Tr. at p. 231 (Jan. 14, 2010).)

- **Mr. Anderson, Energy Commission:** In response; "I don't disagree. I agree with everything he [Mr. Cashen] said." (*Id.)* Aside from direct, Project-related mortality, habitat fragmentation is the single most significant impact to desert tortoise and other sensitive species. The reduced Ivanpah 3 scheme will not stop fragmentation in the important upper reaches of the Ivanpah Valley because it would still destroy 1,227 acres of land in the northern part of the Ivanpah Valley. (SEIS 14.) In contrast, the Modified I-15 alternative would leave intact 1836.3 acres in the upper Ivanpah Valley as one contiguous habitat block, while developing lands at an elevation lower than 2800 feet.

In Favor of the Modified I-15 Alternative:

Comment Supp-19-9: Of the two alternatives analyzed in the DSEIS, the Modified I-15 alternative is preferred. It would avoid more of the intact desert tortoise habitat and rare plants on the site. The Mitigated Ivanpah 3 project would still impact several rare plant communities, and would fragment desert tortoise habitat for a population of tortoises which have a significant portion of their range in the Northern Ivanpah Valley. Finally, in addition to providing a full range of alternatives and a robust analysis of each alternative, BLM must identify and analyze measures to avoid adverse impacts, as well as adequate mitigation measures for unavoidable impacts.

Comment Supp-11-1: The Modified I-15 Alternative is the Environmentally Superior Option

As mentioned, the SEIS's Modified I-15 alternative is based on a June 2009 Sierra Club proposal to develop all three units adjacent to I-15. The SEIS's Modified I-15 alternative moves the Ivanpah 3 unit south and slightly east of the existing Ivanpah 1 unit, and adjacent to I-15. (SEIS Fig. 5-1.) **Importantly, the applicant itself proposed the footprint for this alternative, demonstrating that such a configuration is technically feasible.** (SEIS at 104.) Thus, the record shows that the Modified I-15 alternative is technically feasible, and is the only alternative that:

- Reduces the need for deleterious translocation of desert tortoise;
- Sites the Project in the most degraded land in the Ivanpah Valley;
- Avoids habitat fragmentation, thereby protecting habitat for desert tortoise and other sensitive species such as bighorn sheep;
- Avoids some impacts to sensitive plant species by siting the Project at a lower elevation;
- Causes no concrete negative or harmful visual impacts; and
- Avoids impacts related to storm water drainage.

Comment Supp-10-1: The supplement addresses two new alternatives - the Mitigated Ivanpah 3, which the proponent released shortly before the close of the comment period on the original draft, and the Modified 1-15 "alternative, which the Sierra Club previously submitted to the BLM and to the California Energy Commission but which was not considered in the original draft. Both of these alternatives reduce the

environmental impacts of this project and, as such, testify to the value of the NEPA process and its alternatives analysis in particular. Of the two new options considered, the Modified 1-15 alternative seems preferable from an environmental perspective: it would reduce impacts to the desert tortoise, see SDEIS at 136, rare plant communities, id. at 200, golden eagles, id. at 130, and Nelson's bighorn sheep, id. at 129- although to be sure it would still have significant impacts, see, e.g., id at 136. We regret that a significantly smaller option has not been considered: such an alternative would reveal more clearly the tradeoffs involved in obtaining renewable energy from this site.

Comment Supp-11-2: The Modified I-15 Alternative is the Superior Option for Protecting the Threatened Desert Tortoise

Overall, the Modified I-15 alternative is significantly better for the threatened desert tortoise. According to the SEIS, the Modified I-15 alternative's impacts on desert tortoise would be less than those of Mitigated Ivanpah 3. (SEIS 199.) The Modified I-15 alternative protects the tortoise by siting the Project in lands already degraded by the interstate; reduces the need to translocate; protects against habitat fragmentation; and, preserves habitat connectivity in the upper reaches of the Ivanpah Valley.

Comment Supp-11-17: As outlined above, the administrative record developed during the BLM's NEPA process and the California Energy Commission's proceeding overwhelmingly proves that the Modified I-15 alternative is the environmentally superior option short of no project. The evidence is clear that fewer desert tortoises occupy the lands adjacent to I-15 as compared to the habitat at the proposed Ivanpah 3 unit. Likewise, the record shows that fewer rare plant communities occur on these lands.

The wildlife agencies may not know with complete certainty the number of desert tortoises or rare plants occurring on the lands adjacent to I-15, but the same is true for any land proposed for development in the valley. The applicant's most current desert tortoise surveys are now several years old, and it has failed to conduct spring or fall surveys for approximately the last 4 seasons. Therefore, because the recommended mitigation for both desert tortoise and rare plants is salvage and translocation, the exact numbers of any given species would not change the final mitigation strategy. In other words, the actual number of individuals that will require salvage efforts is unknown for all project areas additional surveys will be necessary prior to construction. Therefore, the record shows that the Modified I-15 alternative will affect fewer tortoises and rare plants and will result in less habitat fragmentation, thereby protecting the important upper reaches of the Valley.

Based on the foregoing, Sierra Club respectfully requests that if the BLM decides to issue the applicant a right-of-way, it do so for the Modified I-15 alternative as described in SEIS.

Comment Supp-11-3: First, much of the land contained within the Modified I-15 alternative is already degraded. (SEIS 127.) In addition, the scientific literature is clear concerning the significant impacts highways have on tortoises, beyond 'mere' collisions.

(SEIS 127.) Studies show that there are significant impacts on desert tortoise at distances less than 800 meters from a highway. The Modified I-15 alternative takes advantage of this by situating a portion of the facility in an area with poor quality habitat and relatively close proximity to the interstate. The fact that the habitat is already affected further supports the conclusion that there are fewer desert tortoise found in that area.

Second, the record shows that proximity to I-15 not only results in degraded habitat but also has a direct bearing on tortoise density: "Tortoise densities may substantially decline with proximity to I-15 due to highway mortality, declining habitat quality, and habitat fragmentation." (SEIS 127.) According to Energy Commission staff biologist Susan Sanders, I-15 creates a mortality hazard and increases habitat fragmentation for all wildlife species. (*Id.*) Other experts testified at the Energy Commission hearings that there is lower burrow density in the lands adjacent to I-15. (*Id.*) This lower burrow density correlates to a lower tortoise population and may be due to "less desirable habitat, including flatter terrain occurring at [] lower elevations, fewer washes, potential differences in burrow habitat, greater frequency of dirt roads, differences in forage quality (more weed species) and proximity to I-15." (*Id.*) This lower quality habitat and lower overall density means desert tortoise numbers are fewer which in turn would reduce the number of translocated individuals at Project construction.

Comment Supp-11-4: Locating Ivanpah 3 next to the interstate would "reduce local habitat fragmentation, providing larger, contiguous areas of tortoise habitat." (SEIS 127.) Biologists were unanimous at the Energy Commission hearings that habitat fragmentation is a significant concern for Ivanpah Valley desert tortoise. For example, according to biologist Scott Cashen, "Habitat fragmentation and community-level disturbances are known threats to the long-term viability of many plant and animal species. In my opinion, reducing these threats would benefit the sensitive species known to occur in the Ivanpah Valley." (Hearing Exhibit. 611 at pp. 8-11.) The other experts shared these concerns:

- **Dr. Ron Marlow**: "Lots of really good potential habitat is not being occupied by tortoises because of the impacts of the existing road . . . To the extent that we're going to have a project, then extending off at an angle to I-15 simply provides another division to the habitat . . . And eventually whatever value a large piece of land might provide to a species like desert tortoise, which ranges over a relatively large area, which experiences localized extinctions and fluctuations of population by losing the connectiveness is pretty direct . . . placing two linear impacts against each other would make more sense. It reduces the edge over which that impact is expressed in the population." (Tr. at pp. 419-420 (Jan. 11, 2010).)

- **Dr. Michael Connor**: "We have a situation where we do, indeed, have a freeway running down the valley. And there's absolutely no doubt that that freeway causes fragmentation of the habitat." (Tr. at pp. 436-437 (Jan. 11, 2010).)

- **California Native Plant Society**: "the biological affects of ecosystem fragmentation are well documented (Saunders et al., 1991). In general, the fragmentation of rare plant habitat on the Project site will lead to two fundamental changes across the landscape; 1) an increasing isolation of remnant populations, and 2) a decrease in the total amount of available habitat for remnant populations. These two phenomena will be repeated throughout Ivanpah Valley." (Ex. 1014 at p. 3.) The Modified I-15 alternative is the only alternative that will reduce habitat fragmentation in any meaningful way.

Comment Supp-11-5: The Modified I-15 Alternative is the Only Alternative That Preserves Blocks of Contiguous Habitat in the Upper Reaches of the Valley

The record also shows that in addition to reducing habitat fragmentation, it is imperative to preserve habitat connectivity to protect sensitive desert species. In this way, Energy Commission staff testified to the importance of "maintaining large portion of contiguous habitat." (SEIS 127.) Likewise, according expert Mark Jorgensen "[t]he obvious thing to me would be don't go so high up on the alluvial fan. Go down . . . to a more impacted zone down near the freeway." (Tr. at pp. 447, 465 (Jan. 11, 2010).) The Modified I-15 alternative maintains the greatest amount of connected habitat for listed and sensitive biological resources.

Comment Supp-11-6: The Modified I-15 Alternative is the Most Protective Alternative for Big Horn Sheep

BLM manages Nelson's bighorn sheep as a sensitive species, including in the Ivanpah Valley. According to the SEIS, "it is likely that bighorn sheep move down into the upper elevations of Ivanpah Valley, including the ISEGS project area to forage." (SEIS 38.) Thus, the SEIS determined that alluvial fans near steep and rocky terrain can be crucial foraging habitat; ewes nearing the end of gestation may need additional nutrients and come down for higher quality foliage. (*Id.*) Although the sheep might "use areas like the project site for only a three weeks, [] those three weeks are critical." (*Id.*) Additionally, California Fish & Game has established that wildlife corridors are present in the northern area of the valley, raising important concerns about the adverse impacts the Project could have on bighorn sheep. (CDFG 2008, SEIS 38.) The applicant must be required to protect big horn habitat in the Ivanpah Valley.
In any case, the Modified I-15 alternative is the most protective of big horn sheep: "Since the proposed Ivanpah Unit 3 site is furthest north, the reconfiguration of that unit away from Clark Mountain, closer to the Dry Lake Bed, and adjacent to I-15 would reduce potential impacts to bighorn sheep and other big game movement corridors." (SEIS 129.) According to the SEIS, big game "would benefit from co-location to the highway, minimizing habitat fragmentation, retaining movement corridors, and avoiding impacts to high quality habitat along the northern portion of the project." (SEIS 137.) Wildlife biologist and big horn sheep expert, Mark Jorgensen, testified before the Energy Commission that the Project should not be built high on the alluvial fan; instead, any development should occur at the bottom of the alluvial fan along I-15. (Ex. 939,

Testimony of Mark C. Jorgensen.) The record is clear that the Project will affect big horn sheep, and it is likewise clear that the Modified I-15 alternative is the least intrusive option analyzed.

Comment Supp-11-7: The Modified I-15 Alternative is the Most Protective Option for Rare Plant Communities

According to intervenor California Native Plant Society, "the biological effects of ecosystem fragmentation are well documented (Saunders et al., 1991). In general, the fragmentation of rare plant habitat on the Project site will lead to two fundamental changes across the landscape: 1) an increasing isolation of remnant populations, and 2) a decrease in the total amount of available habitat for remnant populations. These two phenomena will be repeated throughout Ivanpah Valley." (Ex 1014, at p. 6.) The record shows that the Modified I-15 alternative will reduce impacts on rare plant communities. (SEIS 200.) The applicant has verified that the "most suitable habitat for rare plants occurs in elevations above the 2,750 foot contour . . . [b]elow that elevation, the topography tends to flatten out, the habitat lacks the microtopography and soil textures upon which many rare plant species depend, and the overall plant diversity is reduced . . ." (SEIS 132.) Sierra Club has already shown that nearly 1500 acres of land near I-15 is at an elevation lower than 2800 feet. (Ex. 305 at p. 7). Given that habitat below 2,750 feet is often less diverse and of lower quality, then the Modified I-15 alternative is the more protective alternative for rare plant species. Also, as shown above, California Native Plant Society testified that habitat fragmentation is devastation to rare desert plant communities, thus its final conclusion was that actual avoidance of detrimental take was impossible so "the development of real and meaningful alternatives" was essential. (Ex. 1014 at pp. 3, 6.)

Comment Supp-11-8: Potential Issues Related to Glare Do Not Outweigh the Positive Effects on Key Observation Points and Protection of Biological Resources

The Modified I-15 alternative would reduce impacts on visual resources in certain areas. The relocation of unit 3 closer to I-15 will serve to protect key observation points including Benson mine, Stateline Wilderness, and the Mojave National Preserve. The SEIS concluded that Modified I-15 alternative would present fewer visual impacts in recreational areas to the west and north as compared to the proposed project and Mitigated Ivanpah 3. (SEIS 204.)

Glare is the only potential increased impact from choosing the Modified I-15 alternative, but the SEIS was "unable to determine impact from glare, but *could* be higher." (SEIS 203.) However, there is no evidence in the record indicating that this is a negative impact. No party to the Energy Commission proceeding or member of the public has complained about visual impacts from the highway or across I-15 as being unacceptable. Additionally, among the environmental intervenors in the Energy Commission proceeding, the opposition to the Project is based on the unmitigated impacts on biological resources, not visual resources. A marginal increase in visual impacts would certainly offset a reduction in desert tortoise and rare plant mortality.

Most relevant, in its comments to BLM on the FSA/DEIS, Sierra Club showed that Project reconfiguration along the Interstate 15 corridor would not present any significant human health impacts or safety hazards from glare beyond what is already anticipated by the current footprint. (Sierra Club Opening Brief to the California Energy Commission, at pp. 10-12.) Moreover, the Project would further minimize impacts from glare given Commission staff recommended conditions TRANS-3 and TRANS-4. Essentially, the power tower receivers and the I-15 facing-heliostats should be located at least 1,000 meters from the interstate. (*Id.*; Ex. 300 at p. 6.10-16.) The slight *potential* for a possibility of increased glare should not supersede the benefits to biological resources the Modified I-15 alternative provides.

Comment Supp-11-9: The Modified I-15 Alternative is Better for Air Quality Because It Will Have a Lower Mass of Construction Emissions

Although "the rate of emissions would be the same for the construction of both alternatives, the overall mass of emissions associated with the Modified I-15 alternative would be lower. . ." (*Id.* (emphasis added).) Operating emissions associated with operation of Modified I-15 alternative would be the same as the Mitigated 3 Alternative. (SEIS 119.) As the Modified I-15 alternative is likely to have slightly lower emissions due to the shorter construction time, it is the better choice for protecting the Mojave Desert's air quality.

Comment Supp-11-10: It is Unlikely That Any Cultural Resources Will be Impacted Because the Larger, Original Project Did Not Impact any Cultural Resources

The DEIS's inventory of historic resources is sufficient for most of the Modified I-15 alternative. (SEIS 138.) Although impacts to specific resources in the reconfigured Ivanpah 3 location are unknown, the original, larger project would not have had an adverse impact on any known or unknown resources. (SEIS 139.)

Comment Supp-11-11: The Modified I-15 Alternative will Reduce the Potential of Flash Flooding

The DEIS concluded that the location of the project on an active alluvial fan was subject to flash flooding. (SEIS 158.) Based on the Modified I-15 alternative reduced acreage, it is likely that the alternative has an overall lower risk for stormwater damage impacts. (SEIS 161.) Additionally, the stormwater impacts are likely to be the "same or lower than those in Mitigated Ivanpah 3." (SEIS 203.) Impacts from stormwater flooding events are a serious concern, and the Project must minimize them to the maximum extent feasible. As such, the Modified I-15 alternative is the environmentally superior option in terms of stormwater and drainage issues.

Comment Supp-17-4: The modified I-15 alternative moves the project further from the Preserve boundary and is likely an improved option for desert bighorn sheep, and perhaps would result in slightly less impacts on desert tortoise, as indicated in the

document. While it may be slightly less visually impacting from Clark Mountain, it probably is a greater visual impact for visitors enjoying views of Clark Mountain from I-15.

Comment Supp-19-5: Of the alternatives considered, Defenders prefers the I-15 Alternative that the Sierra Club previously submitted to BLM and CEC. FSA/DEIS, page 4-44. Sierra Club's alternative would have moved all three units along the highway, taking full advantage of the degraded, marginal habitat adjacent to I-15. By contrast, the Modified I-15 Alternative moves only Unit 3 to the highway area. DSEIS, page 25. Although Defenders prefers the Sierra Club's I-15 Alternative, the Modified I-15 Alternative would still reduce many impacts to biological resources, as described in the DSEIS:

The reconfiguration of the proposed Ivanpah Unit 3 to a site adjacent to I-15 would likely result in a reduction in overall impacts to biological resources. For desert tortoise, the Modified I-15 Alternative site would be located within an area already impacted by the proximity of the highway. It is estimated that 315 acres of the reconfigured location of Ivanpah Unit 3, equivalent to 25 percent of the Unit, is adversely impacted by the presence of the highway. Habitat is variable, with areas located below 2,750-feet in elevation consisting of lower quality habitat due to terrain (flat topography with fewer washes), lower forage quality, and proximity to the highway. Fewer tortoises and burrows have been reported at the alternative site (Berry 1984, Cashen 2010), although formal surveys have not been conducted. DSEIS, page 136.

Comment Supp-19-7: The Modified I-15 Alternative is somewhat superior to the Mitigated Ivanpah 3 Alternative. Although the latter claims to avoid rare plant communities and desert tortoises, in fact only those rare plants and tortoises observed on the 433-acre mitigation area would be avoided. Rare plant occurrences and desert tortoises in the remaining 3,700 acres would still be affected. DSEIS, page 194. By contrast, the Modified I-15 Alternative avoids more tortoises and rare plants, and utilizes land near the highway which has marginal habitat value. The Modified I-15 Alternative would reduce impacts to golden eagles, which are protected under the Bald and Golden Eagle Protection Act, 16 U.S.C. §§ 668 et seq., and the Migratory Bird Treaty Act, 16 U.S.C. §§ 703 et seq., by increasing the buffered distance from suitable nesting habitat and human activities associated with the project. DSEIS, page 130. The Modified I-15 Alternative would also have a lesser impact on Nelson's bighorn sheep by broadening the movement corridor along the north side of the project area. DSEIS, page 129.

In conclusion, the Modified I-15 Alternative may reduce impacts to biological resources more than would the Mitigated Ivanpah 3 Alternative. However, neither of these alternatives completely avoids such impacts. Moreover, the two alternatives taken together do not represent a reasonable range of alternatives pursuant to NEPA. *See* 50 C.F.R. § 1502.14(a). Only a thorough alternatives analysis, covering the full spectrum of alternatives including a private land site alternative, will enable BLM to make an informed decision concerning the siting of this project.

Opposition to the Modified I-15 Alternative:

B. The Modified I-15 Alternative
The Modified I-15 Alternative would present significant technical problems, fail to meet the time deadline necessary to commence construction in 2010 and thus fail to meet federal and state policy objectives. As noted in the SDEIS, it would present the same types of biological impacts as those that would be associated with the Mitigated Ivanpah 3 Alternative; since SDEIS and CEC Staff agree that both alternatives would have negative desert tortoise impacts, and since the CEC Staff has concluded, based on extensive analysis of a very thorough record, that these impacts would be less than significant under the Mitigated Ivanpah 3 Alternative, any of the speculative benefits claimed for the Modified I-15 Alternative relative to the Mitigated Ivanpah 3 Alternative, if in fact there were any at all, would be minimal at best. Moreover, as the SDEIS concludes and as has been uncontested in the CEC proceeding, the Modified I-15 Alternative would have potentially greater impacts to Visual Resources, being located much closer to I-15 (only 1,000 feet from I-15). The Modified I-15 Alternative would therefore not be preferable with respect to the BLM's purpose and need for this project, and should not be selected as the basis for a BLM decision.

1. The Modified I-15 Alternative Is Not Preferable Considering All Impacts
   The CEC Staff, after extensive analysis of an exceptionally thorough record established through an adversarial proceeding allowing cross-examination of witnesses, determined not only that the Mitigated Ivanpah 3 Alternative would have a less-thansignificant biological impact, including its impact on desert tortoise, and that relocating the Ivanpah 3 unit nearer the highway, as the Modified I-15 Alternative would attempt to do, would not avoid or minimize desert tortoise or other biological resource impacts. In other words, under either alternative, there would be biological impacts, but under either alternative, those impacts would be at a less-than-significant level. This latter conclusion, that the Modified I-15 Alternative would not avoid or minimize desert tortoise impacts, is also echoed in the SDEIS.

2. The Modified I-15 Alternative Could Not Be Made Technically or Financially Feasible in Time to Meet ARRA Deadlines.
   The Modified I-15 Alternative, while more than adequately characterized for purposes of NEPA alternatives evaluation, lacks sufficient technical detail to allow for the precise engineering required for the planning and contracting necessary to proceed with an EPC contract. It therefore would not allow for the detailed cost-revenue analyses required to support project financing. This detail would require a minimum of 3 to 4 months of further characterization and engineering analyses, after which additional time would be required for updating project financing analyses. It is clear, however, that the substantial changes needed to develop a unit in the area proposed by the Modified I-15 Alternative, relative to the small changes required for the Mitigated Ivanpah 3 Alternative, would substantially increase costs. Since the irregular shape of the land identified for a third unit by the Modified I-15 Alternative is not conducive to the central optical focus required for power tower technologies such as that to be deployed

at ISEGS, it is likely that the size of the third unit would have to be significantly decreased, reducing revenues.

Increased costs and decreased revenue would further jeopardize project financing, and hence project viability, absent a significant increase in PPA pricing. Even if the counterparties to the PPAs would agree to such increased pricing, the negotiation of increased prices, which would be subject to Independent Evaluator participation under CPUC rules, and the time required for CPUC review and approval of the revised contracts, would take considerable time and could not be started until after financial analyses required to justify the price increases were completed. CPUC approval of the PPAs would be a condition precedent to closure of project financing. Thus, there is considerable uncertainty associated with the ability to proceed with this Alternative.

In short, the Modified I-15 Alternative would require at least six months of additional analyses, negotiations, contract and financing revisions, and regulatory contract approvals before financing could be closed, jeopardizing Section 1603 incentives. Closure of financing, as discussed above, is a necessary prerequisite to releasing the funds that would enable Applicant to meet the requirements of the ITC grant before the deadline elapses in 2010. Without the ITC grant, project financing would collapse, and the project could not be implemented. The Modified I-15 Alternative simply could not be made to meet the federal or state policy objectives for fast-track projects.

Response: *BLM appreciates the recommendations for which alternative to select as the preferred alternative. These comments, and their rationale, have been considered in the selection of the preferred alternative in the FEIS, and will be considered in the ROW grant decision in the Record of Decision.*

3.0 PURPOSE AND NEED

3.1 Scope of Purpose and Need

Comment Supp-8-2: As the Center pointed out in our comments on the DEIS, the purpose and need statement in the DEIS was unlawfully narrow and thereby cabined the choice of alternatives. Unfortunately, the Supplemental DEIS fails to cure this error. . The BLM is still relying on a faulty Purpose and Need description that unnecessarily narrows the range of alternatives (and still ignores the requirements for NEPA analysis of the proposed plan amendment). BLM can, and indeed must, undertake full consideration of alternatives under NEPA when reviewing a plan amendment and proposed project and (as discussed extensively in the Center's 2/10/2010 comments), there are several potential feasible alternatives (including several that would have fallen well within BLM's jurisdiction) including a plan amendment to promote conservation of the desert tortoise and protect the high-quality tortoise habitat in the Northern Ivanpah Valley from industrial development. The BLM still fails to consider any off site alternatives that could avoid impacts to the resources of these public lands.

Response: *The range of alternatives identified in Section 3 of the FEIS is not constrained by the purpose and need, the applicant's objectives, or anything other than technical and economic feasibility and the expected impacts associated with each alternative. The range of alternatives considered includes Private Land, locations and technologies not proposed by the applicant, and alternatives outside of BLM's jurisdiction to select. Four of these alternatives were carried into Section 4 for more detailed analysis – again, one of these alternatives (the Modified I-15 alternative) is not considered to meet the applicant's objectives, and is outside of BLM's jurisdiction to select.*

3.2 Inclusion of Timeframes in Purpose and Need

Comment Supp-20-1: The DEIS identified three project objectives that were intended to reflect the Applicant's objectives and BLM's stated Purpose and Need of the Project. These three objectives were; 1) to safely and economically construct and operate a nominal 400-MW, renewable power generating facility in California capable of selling competitively priced renewable energy consistent with the needs of California utilities; 2) to locate the facility in. areas of high solarity with ground slope of less than 5 percent; and, 3) to complete the impact analysis of the project by the first quarter of 20l0 so that, if approved, construction could be authorized in 2010 and beyond; The DEIS indicated that these objectives were considered in the comparison of alternatives as required under the National Environmental Policy Act (NEPA).

EPA supports BLM's determination in the SDEIS to remove the set generation capacity or output of the Project from the purpose and need statement. By removing the 400 megawatts (MW) specified in the DEIS, BLM is able to consider other alternatives that could have lesser or greater generation capacities (at pg. 8). The SDEIS does not address the timeline constraint specified by the third objective. To allow for evaluation of a full range of reasonable alternatives, EPA continues to recommend that the Project's objectives should not restrict the Project to a specific timeline.

Recommendations:

- Revise the Project's objectives to remove the time constraint for completion of the impact analysis so that construction could be authorized. The deadline imposed by the time constraints appears to preclude further analysis of the Project's impacts, which may unduly restrict the consideration of alternatives. Rather thal1limiting the alternatives to those able to meet a certain deadline, BLM should identify and evaluate a full range of reasonable alternatives and specify whether or not each can meet the desired deadline. This would enable decision makers and the public to make informed decisions about whether or not the benefit of meeting the desired deadline outweighs the benefits of other alternatives that would not meet that deadline.
- Discuss in the FEIS whether the 2010 timeframe to begin construction served as a key criterion for identifying, evaluating, or eliminating alternatives from future analyses.

Response: *Section 3 of the FEIS has been revised to remove the ground slope and timeline objectives. Although these were stated to be criteria for the evaluation of alternatives in the DEIS, neither was actually used as a rationale to eliminate any alternative from detailed evaluation. Therefore, stating that these were considerations was inaccurate, and they have been removed from the FEIS. The ground slope information is still relevant to the comparison of impacts between alternatives, because some alternatives would require a greater degree of grading than others. This evaluation has been kept in the alternatives discussions.*

4.0 CUMULATIVE IMPACTS

4.1 Other Future, Foreseeable Projects

Comment Supp-8-9: Here, the BLM should not proceed any further in the NEPA process for the proposed project without an analysis the direct and indirect impacts of the proposed project in conjunction with other proposed projects in this area, including at minimum the proposed Silver State solar project in Nevada and the proposed Eldorado-Ivanpah Transmission Project ("EITP") transmission line upgrade and substations that are currently also undergoing environmental review by BLM.

The EITP is necessary for this proposed project and it is clear that the EITP is both a cumulative and a connected project and should have been considered by BLM in a single environmental review. Indeed the stated purpose of the EITP is to facilitate access to the California energy market for the proposed Ivanpah project and solar projects in Southern Nevada. Although the purpose and need statement for BLM in the EITP is unreasonably narrow, it is clear that the purpose of the EITP project is to connect the proposed solar projects with the California market. As the EITP DEIS states, an objective of the project is "[t]o connect renewable energy sources in the Ivanpah Valley area." EITP DEIS at 1-11 (Joint State and Federal Objectives). Similarly, as the project proponent for the EITP, Southern California Edison ("SCE"), recently stated in a filing with the California Public Utilities Commission ("CPUC")

Project Overview

1. EITP, which primarily consists of a new substation and 35-mile transmission line upgrade, will interconnect up to 1,400 MW of new renewable generation (primarily solar) near the southern California-Nevada border, including Brightsource Energy's 400 MW Ivanpah Solar Energy Generating System (ISEGS), which is currently under regulatory review at the California Energy Commission (07-AFC-05).
2. EITP will provide the electrical facilities and capacity to facilitate access and delivery of new solar generation in California and Nevada.
3. EITP will allow new solar projects in southwestern Nevada to interconnect into the western states market.

SCE, Eldorado-Ivanpah Transmission Project (EITP) Backgrounder - May 2010, Submitted as Appendix A to SCE's (U 338-E) Notice of Ex Parte Communication filed May 28, 2010.

Comment Supp-8-10: The proposed Silver State solar project is a similar and cumulative action given the timing of the environmental review and its impacts on the same local biological resources in the Ivanpah Valley as the proposed Ivanpah project. Moreover, the Silver State solar project is also a connected project both literally and figuratively because it will also connect to the EITP lines and substations when they are upgraded and is depending on the EITP for access to the California markets.

In light of the CEQ guidelines and the case law, the proposed Silver State solar project and the proposed EITP should have been considered in conjunction with the proposed Ivanpah project in a single environmental review. Had BLM done so, it would have properly framed the questions before it and have fully considered the impacts to the Ivanpah Valley from the *de facto* solar zone that is being created in this area without any land use planning being undertaken and without consideration of the overall impacts of the proposed wide-spread, sprawling, large-scale industrialization of the Valley as a whole.

At minimum, the BLM should consider all of the impacts of the proposed project, along with impacts of the transmission upgrade and substations and the proposed Silver State project as direct impacts of connected projects. Even assuming for the sake of argument alone that the impacts could be described as indirect effects or "secondary" or "induced" effects attributable to the proposed project and the necessary transmission line upgrade and the projects that are facilitated by that upgrade such as the Silver State proposal, the need for adequate coordinated environmental review is no less. *See City of Davis v. Coleman*, 521 F.2d 661 (9th Cir. 1975) (requiring agency to prepare an EIS on effects of proposed freeway interchange on a major interstate highway in an agricultural area and to include a full analysis of both the environmental effects of the exchange itself and of the development potential that it would create).

By failing to combine or even coordinate this NEPA process with the approval process for all of the similar, cumulative, and connected actions BLM has undermined full and fair public review of the impacts of the project in violation of NEPA. BLM must disclose and consider all of the connected, cumulative and similar projects' significant impacts together. To do otherwise would be unlawful. Cumulative impacts analysis in an EIS alone is not sufficient where projects are so closely connected as here and will result in a new industrial zone being created on public lands that now serve multiple uses including providing high-quality occupied habitat for a threatened species.

Response: *BLM has reviewed the comments provided with respect to cumulative impact analysis in the DEIS and SDEIS, including the temporal and geographic scope of other projects that may contribute to cumulative impacts, the means of performing the impact analysis, and the mitigation proposed to address cumulative impacts. The Cumulative Scenario section has been revised , and the cumulative impact analyses,*

which had previously been included in the resource-specific sections, have been combined into the revised section. By including the identification of other projects, and all resource analyses into a stand-alone section, the FEIS addresses the difficulty in tracking the projects through the DEIS.

4.2 Mitigation for Cumulative Impacts

Comment Supp-19-4: Third, the project's cumulative impacts are significant. BLM concedes that "even with mitigation, cumulative impacts could result in substantial impacts to wildlife and special status animal and plant populations." DSEIS, page 136. The multiple projects planned for the region would increase fragmentation of desert tortoise habitat, disrupt migration corridors, increase mortality due to construction hazards and translocation stress, and ultimately weaken a genetically distinct population of tortoises. Given RETI's preference for private lands, the seriousness of the impacts, the uncertainty of mitigation measures and the wide range of cumulative impacts in the region, BLM must analyze a private land alternative for the Ivanpah SEGS project.

Response: *BLM has reviewed the comments provided with respect to cumulative impact analysis in the DEIS and SDEIS, including the temporal and geographic scope of other projects that may contribute to cumulative impacts, the means of performing the impact analysis, and the mitigation proposed to address cumulative impacts.*

In the DEIS, the mitigation measures proposed in each resource section were developed to address not just the direct impacts, but also the indirect and cumulative impacts associated with that resource. In addition, by combining the cumulative impacts analyses in the revised Cumulative Scenario section, the FEIS also specifically evaluates whether additional mitigation measures are required.

Reduction of cumulative impacts to biological resources was also a substantial issue in BLM's decision to analyze the Mitigated Ivanpah 3 and Modified I-15 Alternatives in the SDEIS.

4.3 Growth Inducing Impacts

Comment Supp-8-8: Although the Supplemental DEIS does provide a bit more detail on some aspects of the proposed project – now called the Mitigated Ivanpah 3 Alternative – than was provided in the DEIS, it does not cure many of the shortcomings of the DEIS. The Supplemental DEIS still ignores the fact that by analyzing connected projects piecemeal BLM is undermining rational planning and unlawfully segmenting the environmental review. Attached are two maps produced by the Center: the first shows the Ivanpah Valley as it is now and the second shows the Ivanpah Valley with the proposed solar, wind and transmission facilities primarily on public lands. The change that would occur from a largely natural area to a largely industrial zone is both significant and unexamined by the BLM.

NEPA's implementing regulations explain that agencies should consider connected, cumulative, and similar actions in the same impacts statement. "Connected actions" must "be considered together in a single EIS." *Thomas v. Peterson*, 753 F.2d 754, 758 (9th Cir. 1985); 40 C.F.R. § 1508.25(a)(1). Connected actions are those actions that:

i. Automatically trigger other actions which may require environmental impact statements.
ii. Cannot or will not proceed unless other actions are taken previously or simultaneously.
iii. Are interdependent parts of a larger action and depend on the larger action for their justification.

Response: *The revised cumulative analysis presented in the FEIS estimates the direct, indirect, and cumulative impacts that would occur assuming that all of these proposed projects are implemented. Although this may over-estimate the impacts that will actually occur, it presents a conservative analysis, based on an assumption that the ISEGS and EITP projects will increase the likelihood of the other solar projects being developed.*

4.4.1 Project-Specific versus Programmatic Analysis

Comment Supp-10-2: As to cumulative impacts, it is clear that the cumulative impacts of this project will be significant. SDEIS at 136. We regret that, as far as we were able to determine, the SDEIS does not address the creation of a de facto solar energy zone in the Ivanpah Valley and across the border in Nevada, an area which has not been identified as a solar energy study area by BLM or as a competitive renewable energy zone by California's Renewable Energy Transmission Initiative - an issue we raised in our comments on the draft. Equally importantly, the supplement's treatment of cumulative impacts is, like the draft's, almost entirely qualitative. Indeed, rather than provide quantitative information about these impacts, the supplement simply (and repeatedly) references the draft's treatment of them. See, e.g., id. 146 ("The impact of the Modified 1-15 Alternative on cumulative land use impacts in the Ivanpah Valley, and the southern California desert in general, would be almost exactly the same as those identified for the proposed project."). We continue to believe that more quantified estimates of cumulative impacts are needed and that the inclusion of such information would strengthen this document and the BLM's decision-making process.

Response: *This comment requests that the project-specific Ivanpah SEGS EIS be expanded to partially serve the purpose of the Programmatic Solar EIS. In general, it is BLM's preference to develop Programmatic NEPA documentation, and use it as a basis for site-specific projects, which is why the process for the Programmatic Solar EIS is occurring. However, at the same time, BLM has a responsibility to perform a timely environmental review in response to individual applications. Although the Programmatic Solar EIS has not been completed, the Ivanpah SEGS EIS has benefitted from the*

Programmatic process because many of the reviewers on the BLM review teams are involved with both the site-specific EIS and the Programmatic.

5.0 CDCA PLAN AMENDMENT

5.1 Scope of Amendment

Comment Supp-13-14: The two alternatives analyzed in the SDEIS suffer the same lack of compliance issues with the CDCA Plan as amended by the 2002 NEMO Plan Amendment that we identified for the proposed action in our February 11 letter.

The NEMO Plan's mitigation for Category III habitat applies to projects of less than 100 acres. NEMO at 2.27. The two alternatives in the SDEIS are over forty times the maximum acreage for projects covered under the NEMO Plan. The NEMO Plan did not address California State interests in the Northeastern Mojave desert tortoise population. The NEMO Plan does not even list CDFG as one of the agencies consulted (See NEMO Plan Chapter 7). The NEMO Plan failed to address impacts to California's population of Northeastern Mojave desert tortoises. The BLM must therefore fully address impacts to the Northeastern Mojave ESU and to California's interests in the FEIS.

BLM Handbook 1745 - *Introduction, Transplant, Augmentation, and Reestablishment of Fish, Wildlife, and Plants* - requires that "Decisions for making introductions, transplants, or reestablishments should be made as part of the land use planning process (see BLM Manual Section 1622). Releases must be in conformance with approved RMPs. A Land Use Plan Amendment must be prepared for proposed releases if management direction is not provided in the existing Land Use Plan (see BLM Manual Section 1617, emphasis added)." The two new proposed alternatives and the other projects proposed for the project area will result in large scale movement and translocation of desert tortoises. There is no consideration in the California Desert Conservation Area Plan as amended by the NEMO Plan for desert tortoise translocations on this scale. Therefore, a plan amendment is required to comply with BLM policy.

The BLM must adhere to its own policy and prepare an FEIS that proposes and analyses an amendment to the CDCA Plan that provides the required management direction with respect to desert tortoise translocation prior to considering this project. It could then use that guidance to develop a translocation plan for desert tortoises in the project area that includes the required site specific analyses to comply with BLM policy, FLMPA, and NEPA.

Response: *The translocation discussed in this comment, as defined in the BLM Manual 1745 – Introduction, Transplant, Augmentation, and Reestablishment of Fish, Wildlife, and Plants (1992), applies to movement of individuals from existing habitat to locations that are not currently habitat. It does not apply to the smaller-scale movement*

of individuals over short distances, within the same habitat. Therefore, the restrictions discussed in the comment do not apply.

6.0 GENERAL FLPMA/NEPA ISSUES

6.1 Impact Analysis

Comment Supp-10-3: NRDC is a strong supporter of renewable energy and recognizes the need for utility-scale projects to effectively address global warming. We believe that the NEPA process is key to determining which projects proposed for BLM-administered lands should be permitted to go forward and under what terms and conditions. We are sympathetic to the fact that this project is the very first utility-scale project that the Bureau has reviewed under NEPA and we have already seen, in environmental documents on other projects, how much the agency has learned from it. We urge the BLM to continue its efforts to comply with NEPA in connection with this and other fast track projects.

Response: *The comment regarding the sufficiency of the impact analysis Is appreciated, and was considered in the development of the FEIS.*

7.0 PROJECT SCHEDULE

Comment Supp-8-15: On May 4, 2010, the Center and the Sierra Club provided a letter to the BLM requesting a full 90-day comment period for the Supplemental DEIS. To date, we have received no response. The BLM's regulations state that 90-days public review shall be provided for an environmental impact statement for a plan amendment.

> Ninety days shall be provided for review of the draft plan and draft environmental impact statement. The 90-day period shall begin when the Environmental Protection Agency publishes a notice of the filing of the draft environmental impact statement in the Federal Register.

43 C.F.R. §1610.2(e). Because the Supplemental DEIS is an environmental impact statement for the proposed plan amendment, a 90-day public review period should have been provided.

Moreover, the CEQ regulations for NEPA state that the agency must "prepare, circulate, and file a supplement to a statement in the same fashion (exclusive of scoping) as a draft and final statement." 40 C.F.R. §1502.9(c)(4). Because the DEIS was required to be circulated for 90 days, the Supplemental DEIS should also have been circulated for 90 days as well. Despite this clear direction, the BLM provided only 45 days to review this Supplemental DEIS. Notice of Availability of the Supplemental Draft Environmental Impact Statement for the Proposed Ivanpah Solar Electric Generation System Project, San Bernardino County, CA, 75 Fed. Reg. 19992-19993 (April 16, 2010).

It appears that BLM attempted to justify the improperly short comment period for the Supplemental DEIS by concluding without explanation that "it does not add to the plan amendment analysis already contained in the DEIS." Supp. DEIS at 6. However, because the Supplemental DEIS provides environmental analysis for the "proposed project," it clearly provides environmental analysis for the plan amendment as well. BLM cannot separate the plan amendment from the proposed project – the plan amendment is necessary for the project approval and is an integral part of the proposed project. Further, the Supplemental DEIS states without any support that BLM made a determination that the DEIS alone "provides the environmental analysis necessary to support the consideration of the Plan amendment." Supp. DEIS at 56, 145 (same). Because the DEIS is not a decision document, this statement makes little sense. Moreover, the statement appears to imply that BLM has already made a determination regarding the plan amendment that must be informed by the environmental review as a whole. As BLM is well aware, NEPA review cannot be "used to rationalize or justify decisions already made." 40 C.F.R. § 1502.5; *Metcalf v. Daley*, 214 F.3d 1135, 1141-42 (9th Cir. 2000) ("the comprehensive 'hard look' mandated by Congress and required by the statute must be timely, and it must be taken objectively and in good faith, not as an exercise in form over substance, and not as a subterfuge designed to rationalize a decision already made.")

In addition, it is clear that the Supplemental DEIS does in fact provide additional environmental review relevant to the proposed plan amendment. For example, evaluation of alternatives is a focus of the Supplemental DEIS, and review of alternatives is expressly required for the proposed plan amendment pursuant to the California Desert Conservation Area ("CDCA") Plan 1980 as amended. The CDCA Plan provides specific requirements for analysis of Plan amendments. Those requirements include determining "if alternative locations within the CDCA are available which would meet the applicant's needs without requiring a change in the Plan's classification, or an amendment to any Plan element" and evaluating "the effect of the proposed amendment on BLM management's desert-wide obligation to achieve and maintain a balance between resource use and resource protection." CDCA Plan at 121. The information in the Supplemental DEIS is relevant to the review and consideration of all of these requirements for the proposed plan amendment and others.

Because the Supplemental DEIS is in fact part of the environmental review for the draft plan amendment, the full 90-day period should have been provided to the public to comment on the Supplemental DEIS.

Comment Supp-8-16: In light of the inadequacy of the environmental review to date, we urge the BLM to again revise and re-circulate the DEIS and provide 90-days for public review (or prepare another supplemental DEIS and provide an adequate period for public review) before making any decision regarding the proposed plan amendment and right-of-way application. In the event BLM chooses not to again supplement or revise the DEIS to provide adequate environmental review and the required time period for public review, the BLM should reject the right-of-way application and the proposed plan amendment.

Comment Supp-15-1: The BLM's regulations state that 90-days public review shall be provided for an environmental impact statement for a plan amendment.

> Ninety days shall be provided for review of the draft plan and draft environmental impact statement. The 90-day period shall begin when the Environmental Protection Agency publishes a notice of the filing of the draft environmental impact statement in the Federal Register.

43 C.F.R. §1610.2(e). Because the Supplemental DEIS is an environmental impact statement for the proposed plan amendment, a 90-day public review period should have been provided.

In contrast, the BLM notice states that the public review period for the Supplemental DEIS will be only 45 days. Notice of Availability of the Supplemental Draft Environmental Impact Statement for the Proposed Ivanpah Solar Electric Generation System Project, San Bernardino County, CA, 75 Fed. Reg. 19992 19993 (April 16, 2010).

It appears that BLM attempted to justify the improperly short comment period for the Supplemental DEIS by concluding without explanation that "it does not add to the plan amendment analysis already contained in the DEIS." Supp. DEIS at 6. However, because the Supplemental DEIS provides environmental analysis for the "proposed project," it clearly provides environmental analysis for the plan amendment as well. BLM cannot separate the plan amendment from the proposed project – the plan amendment is necessary for the project approval and is an integral part of the proposed project. Further, the Supplemental DEIS states without any support that BLM made a *determination* that the DEIS alone "provides the environmental analysis necessary to support the consideration of the Plan amendment." Supp. DEIS at 56, 145 (same). Because the DEIS is not a decision document, this statement makes little sense. Moreover, the statement appears to imply that BLM has already made a determination regarding the plan amendment that must be informed by the environmental review as a whole. As BLM is well aware, NEPA review cannot be "used to rationalize or justify decisions already made." 40 C.F.R. § 1502.5; *Metcalf v. Daley*, 214 F.3d 1135, 1141-42 (9th Cir. 2000) ("the comprehensive 'hard look' mandated by Congress and required by the statute must be timely, and it must be taken objectively and in good faith, not as an exercise in form over substance, and not as a subterfuge designed to rationalize a decision already made.")

In addition, it is clear that the Supplemental DEIS does in fact provide additional environmental analysis relevant to the proposed plan amendment. For example, evaluation of alternatives is a focus of the Supplemental DEIS, and review of alternatives is expressly required for the proposed plan amendment pursuant to the California Desert Conservation Area ("CDCA") Plan 1980 as amended. The CDCA Plan provides specific requirements for analysis of Plan amendments. Those requirements include determining "if alternative locations within the CDCA are available which would

meet the applicant's needs without requiring a change in the Plan's classification, or an amendment to any Plan element" and evaluating "the effect of the proposed amendment on BLM management's desert-wide obligation to achieve and maintain a balance between resource use and resource protection." CDCA Plan at 121. The information in the Supplemental DEIS is relevant to the review and consideration of all of these requirements for the proposed plan amendment and others.

Because the Supplemental DEIS is in fact part of the environmental review for the draft plan amendment, the full 90-day period should be provided to the public to comment on the Supplemental DEIS.

Therefore, the Center and Sierra Club request that BLM extend the comment period for the Supplemental DEIS for the full 90-day period required in the regulations.

Response: *The ISEGS Draft EIS was circulated for 90 days because it contained a proposed amendment to the CDCA Plan. Although the Supplemental DEIS provided analysis of two additional alternatives which were identified during the DEIS comment period, The CDCA Plan amendment would be unaffected by either of these alternatives. The text of the Plan amendment remains unchanged from that of the DEIS. The BLM will be accepting additional public comment on the CDCA Plan Amendment/FEIS within 30 days after the Environmental Protection Agency publishes the Notice of Availability in the Federal Register.*

8.0 MOJAVE NATIONAL PRESERVE

Comment Supp-17-1: There is a consistent failure in the DEIS and supplemental DEIS to recognize that this project lies in close proximity to the third largest National Park unit in the lower 48 states, Mojave National Preserve. The Preserve's Clark Mountain unit lies less than a mile to the west of the project site. Section 3.2 on page 12 describes the locations and recognizes Primm Casinos and the nearby golf course, but fails to acknowledge a vast area set aside for protection of desert resources. All figures should be modified to show the boundary of the Preserve.

The Coliseum Road, shown on Figure 3.1 on page 13 is the primary visitor access route from the east to the Clark Mountain unit of Mojave National Preserve. This road is currently a primitive, graded dirt road that traverses a mostly undisturbed desert bajada. That situation will change drastically when the Ivanpah project is built and will be a substantial impact to the visitor experience. This figure and others are drawn at a scale that excludes the Mojave National Preserve boundary that lies just outside the image to the west. This is less than full disclosure to the public and should be corrected to incorporate reference to the Mojave National Preserve.

Response: *Throughout the DEIS, SDEIS, and FEIS, BLM has included the evaluation of receptors within the Mojave National Preserve in its impact analyses. This has included wildlife within the Preserve which might enter the proposed project property, air*

emissions from the facility, and visual and recreational impacts to persons within the Preserve. That analysis has concluded that, in some cases, impacts will occur. Although most of these impacts can be mitigated, others, such as visual impacts to hikers within certain portions of the Preserve, cannot be. BLM has considered these impacts in its selection of a Preferred Alternative in the FEIS, and looks forward to continuing our dialogue with the Preserve as we develop a final decision on the ROW grant.

In response to this comment, BLM considered moving the discussions of the impacts to receptors within the Preserve to a stand-alone section. However, this would result in dissecting the existing analyses – for instance, some biological analyses would be in the Biological Resources section, and some would be in the Preserve section. The same thing would happen with visual resources. It is possible that a stand-alone section could be provided to summarize the Preserve impacts in a single location, while keeping the resource discussions intact – however, this would result in taking the impact discussions out of context, which presents its own risks.

After considering the pros and cons of developing a stand-alone section, BLM determined that the impacts to the Preserve are best presented within the resource sections.

9.0 AIR QUALITY

Comment Supp-17-6: Impact: Burning of natural gas in large quantities close to the Preserve and the disturbance on the site will cause air quality degradation.

Potential Mitigation
Project should install monitoring equipment to track particulates and carbon emissions BLM should require additional mitigation if pollutants are detected above a certain level.

***Response**: The air quality modeling conducted for the project was not made specific to the Preserve because the facility's maximum permitted stationary source emissions of NOx, PM, and SOx are less than 12, 6 and 2 tons per year; the predominate wind patterns in the site area are directly away from the Mojave National Preserve; and the maximum project impacts all occur well east and outside of the portion of the Clark Mountain portion of the Preserve and north of the project site well away from the main portion of the Preserve. When considered together, this information is sufficient to conclude that the Mojave National Preserve will not be significantly impacted from the ISEGS project.*

Considering these regulatory and technical issues, specific analysis of air quality within the Mojave National Preserve is not considered necessary.

10.0 BIOLOGICAL RESOURCES

10.1 Biological Resources - General

Comment Supp-8-6: The "reduced footprint" or "mitigated Ivanpah 3" alternative is proposed to reduce the impact to biological resources, however, it will still result the elimination of an extensive amount of currently undisturbed desert that provides habitat for desert tortoise, rare plants other rare organisms. Exactly how many acres remains unclear in the Supplemental DEIS. The project size is identified as 3,640 acres in the Table 3-1 Summary of Applicant's Updates to its ISEGS Development Plans (SDEIS at 10), however Table 3-2 Mitigated Ivanpah 3 Alternative, Acreage of BLM Right-of-Way indicates that 3,564.2 acres is required (SDEIS at 14). Both of these "reduced footprint" acreages are greater than the original ROW application of 3,400 acres (SDEIS at 9) - a 5-7% increase in project impact area and all in prime desert tortoise habitat.

Regardless, the "mitigated Ivanpah 3" alternative still leaves unresolved all of the same issues that plague the "proposed project" The Center submitted extensive comments on problematic issues with the DEIS, yet the addition of this alternative fails to address the majority of the issues raised in the Center's and others comments. Although some acres have been removed under this alternative there is no showing that that area is of as high value to the tortoise as the habitat that remains within the project footprint, and the opposite is likely the case. Moreover, the minimal reduction in the project size without reconfiguration and does not lessen the habitat fragmentation caused by the proposed project.

Comment Supp-8-7: Like the "mitigated Ivanpah 3" alternative, the I-15 alternative suffers from the same unclear potential acres of impacts. The project size is identified as 3,640 acres in the Table 3-1 Summary of Applicant's Updates to its ISEGS Development Plans (SDEIS at 11). Table 5-1 Modified I-15 Alternative, Acreage of BLM Right-of-Way indicates that 3,564.2 acres is required (SDEIS at 107), and the SDEIS (at 123 and 127) states this alternative would permanently impact approximately 4073 acres of occupied desert tortoise habitat – the same as the proposed project. In Bio 17 – desert tortoise compensatory mitigation is based on a 3,582 acre impact (SDEIS at 232). These varying impact acreages makes the Supplemental DEIS appear like it was not carefully written, and serves to confuse decision makers and the public. The varying acreages also shows that impacts have not been adequately evaluated. All of these stated acreages for this alternative exceeds the stated acreage in the original ROW application of 3,400 acres (SDEIS at 9) - a 5-7% increase in project impact area and all in desert tortoise habitat.

Unfortunately, the analysis of the I-15 alternative is sorely lacking. The analysis for biological resources relies on "reconnaissance- level surveys" and other general factors (SDEIS at 122). The SDEIS asserts that "there are fewer washes, and there are many dirt roads fragmenting the habitat." SDEIS at 122. No data are referenced in support of these statements. The comparative term of "fewer washes" assumes comparison with the proposed project's Ivanpah 3 site, but is not definitive. It fails to evaluate if the

"fewer washes" result in less acres of waters of the State that would be impacted than the proposed project, and admits that the evaluation has simply not been done (SDEIS Table 6-9, Comparison of Soil and Water Impacts at 163).

The SDEIS also fails to quantify the "many dirt roads" acreage as disturbed lands. While we agree that dirt roads do cause landscape level fragmentation, BLM has demonstrated successful revegetation of dirt roads where routes are closed as part of designation of a route network, reduction of route proliferation, and conservation of resources. If additional roads are present on the proposed site above and beyond the designated routes as established in NEMO route designation, then those routes should be closed through rehabilitated or other measures to protect the resources and reduce further route proliferation.

The analysis also states that "There are fewer desert tortoises and burrows within this alternative site, compared to the proposed project site", but again no data are referenced in support of these statements. Additionally the SDEIS (at 122) states "Biological resources within approximately 25% of the revised Ivanpah Unit 3 location are already impacted by the proximity of the highway." However, no reference is provided on how that calculation was determined or what the impacts of the highway are for the various biological resources swept into that statement. The Center is only aware of one broad-brush, out-of-season survey that was done for in this general area which is apparently identified as "Recent anecdotal information" (SDEIS at 127). This report did document fewer desert tortoise burrows compared to areas of the proposed project site. However, as recognized in the SDEIS, the I-15 alternative site is topographically diverse, and absent in-season surveys for desert tortoise (and other biological resources), the impacts from this alternative can not be adequately documented and analyzed.

The SDEIS acknowledges that rare plants surveys were not done on the I-15 alternative (SDEIS at 137) in any season. Despite the absence of survey data, the SDEIS concludes that impacts to rare plants "Impacts could be mitigated" (SDEIS Table 6-2, Comparison of Biological Resources Impacts at 138). This is little more than a conclusion based on the lack of data and the SDEIS fails to meaningfully identify impacts, provides no analysis, and therefore is inadequate. Because this and other data relevant to reasonably foreseeable significant adverse effects could have been collected without undue expense, the failure to collect this data is inexcusable under NEPA. 40 C.F.R. §1502.22(a).

In addition, no other resource surveys were done in the previously unsurveyed alternative area. It is speculative that fewer rare resources (both biological and cultural) occur in this area absent surveys. Additionally, the SDEIS recognizes that the "stormwater modeling analysis has not been performed for the reconfigured Ivanpah 3 site" (SDEIS at 113). The lack of environmental review and basic data for this alternative suggest that this alternative is simply a "straw man" alternative, despite the fact that it has *potential* to reduce the environmental impacts. The I-15 alternative was originally identified by the Sierra Club (SDEIS at 104) before the DEIS was prepared,

BLM could have done more to analyze this alternative or selected other nearby alternative sites with no known desert tortoise habitat and likely reduced the level of potential impacts even further. Because BLM failed to meaningfully analyze a reasonable range of alternatives and rejected consideration of feasible alternatives in both the DEIS and SDEIS, the environmental review is inadequate.

***Response**: Although detailed biological surveys of the reconfigured location of Ivanpah Unit 3 in the Modified I-15 Alternative have not been performed, a large amount of data exists upon which to base an analysis. This includes:*

- *Information from reconnaissance-level surveys provided by the applicant, CEC, and intervenors;*
- *Information on the geologic and topographic setting of the area (including the relation of the location to the mountains, Ivanpah Dry Lake bed, and I-15);*
- *Site-specific literature, much of it supplied by the intevenors, discussing the specific density of tortoises and plants on the property; and*
- *More general literature, again supplied by intervenors, discussing the expected impact of the highway on wildlife and vegetation in the area.*

The location is not remote from that of the proposed project – it is directly adjacent and closer to I-15, and is therefore very familiar to project staff. Based on the familiarity of the project staff with the site, and the large amount of other available information, BLM concludes that the level of information is sufficient to allow an evaluation and comparison of impacts associated with the alternative site.

Comment Supp-8-11: Similarly, although the Supplemental DEIS provides a bit more discussion of the re-routed ORV trails, there is no *analysis* of the impacts the re-routed trails might have on biological resources including the translocated tortoises and host tortoises or the likelihood that these re-routed trails would be used as anticipated. That is, will ORV riders travel several miles along the fenceline of an industrial facility? Or are they more likely (as experience shows) to cut off cross-country to more scenic areas and avoid the industrial facility. If so, the re-route of the trails must be analyzed in more detail and alternatives provided that would designate a route that will actually be used rather than one that is likely to lead to additional cross-country travel and route proliferation by ORV riders who do not wish to travel for several miles along an industrial fenceline. The BLM designed a route network when it designated the NEMO routes through a plan amendment, moving routes piecemeal without analysis of the actual use and purpose undermines that planning effort. As BLM is well aware, route proliferation results in damage to soils, wildlife, and plants. These and other issues remain unaddressed in the Supplemental DEIS or the DEIS.

***Response**: The trails in the area are primarily used to access the mountain areas, and the length of the trails following project development will not be substantially different from the current situation. Therefore, there is no reason to believe that cross-country travel off of the trails would increase following project development.*

10.2 Biological Resources - Tortoises

Tortoise - General

Comment Supp-17-5: Impact: The loss of 4,000 acres of desert tortoise habitat in the same recovery unit as the Preserve. Concerned about how that loss affects the recovery actions in the whole recovery unit, which includes the Las Vegas valley. Cumulatively, the NPS appears to be the primary conservation area in this unit and as such should receive substantial assistance through the mitigation fund in meeting desert tortoise recovery actions in the Preserve, including:

Potential Mitigation
Acquisition of private lands that are in critical desert tortoise habitat
Restoration of disturbed lands that are in critical desert tortoise habitat
Funding for education about the Mojave Desert
Research on juvenile tortoise and headstarting
Monitoring of the desert tortoise
Fencing and culverts along primary paved routes in high density critical habitat

***Response**: The EIS has acknowledged the project's impact to desert tortoises and their habitat, and has developed Mitigation Measures to minimize and compensate for the impacts.*

Tortoise – Cumulative Impacts

Comment Supp-13-4: The footprint of the proposed action in the FSA/DEIS was 4,073 acres (about 6.4 square miles) of desert tortoise habitat. The footprint for both alternatives examined in the SDEIS is 3,564 acres (about 5.6 square miles) of desert tortoise habitat. The NEMO Plan identifies that there are 27,300 acres of BLM-managed public lands in the North Ivanpah Valley. Based on that data the proposed alternatives would consume 13% of the North Ivanpah Valley's public land. Since the North Ivanpah Valley accounts for 24% of their habitat, the footprint of the alternatives would consume 4-5% of the Northeastern Mojave ESU desert tortoise habitat in California.

Mitigating for direct impacts on this scale is difficult. However, other major projects are also being proposed in the North Ivanpah Valley not the least of which are an additional power plant and the DesertExpress railway. In the face of the massive cumulative habitat loss and fragmentation that will occur if these projects proceed, it is difficult to imagine how a viable tortoise population could persist in the North Ivanpah Valley. As such, the cumulative impacts threaten to eliminate nearly a quarter of the range of the Northeastern Mojave ESU in California. Neither of the two alternatives reviewed in the SDEIS will reduce these cumulative effects.

Comment Supp-13-8: In summary, the direct, indirect, and cumulatively impacts of the proposed project on the threatened desert tortoise will be severe. Since the Northeastern Mojave population is the most genetically distinct desert tortoise population in California, and the North Ivanpah Valley desert tortoises exhibit behavioral adaptations that may be important for the long-term survival of the species, protection of these tortoises may well be critical to the conservation of the entire listed population in California. We are extremely concerned that the impacts of the proposed project will endanger California's Northeastern Mojave desert tortoise population, and will place the entire Mojave desert tortoise population at risk.

***Response**: The DEIS and SDEIS acknowledge and quantify the cumulative impacts to desert tortoises and their habitat as a result of the proposed project, and the other projects referenced in these comments.*

Tortoise – Reported Baseline Information

Comment Supp-13-3: The proposed power plant project will have severe direct, indirect and cumulative impacts on California's population of Northeastern Mojave desert tortoise Evolutionarily Significant Unit ("ESU"). These impacts include destruction and loss of habitat, take of tortoises, habitat fragmentation, population fragmentation, loss of connectivity, and loss of viability. The two alternatives proposed in the SDEIS would have similar impacts on desert tortoise to those discussed for the proposed action in our February 11, 2010 letter.

The SDEIS, like the FSA/DEIS, fails to provide crucial baseline information such as the amount of habitat in the Northeastern Mojave Recovery Unit in California, and fails to adequately document impacts to this resource. Without an adequate description of the ESU, a
full analysis of the impacts of the proposed project is impossible, nor is a meaningful comparison
of alternatives or the development of adequate mitigation measures possible.

As we described in our comments, the tortoises in the Ivanpah Valley differ from other desert tortoise populations in California, and the population's limited range, overall importance to genetic diversity, and behavioral adaptations underlie the need to conserve them. This is especially important given the threats posed by global climate change.

Comment Supp-13-5: The NEPA documents are unclear as to how many tortoises will be directly affected by each of the proposed power plant alternatives. How many, if any, individual desert tortoises would benefit directly from the "Mitigated Ivanpah 3" proposal is unclear. This is because (a) actual desert tortoise numbers on the ISEGS site has not been determined; and, (b) the current location of the three desert tortoises encountered during the protocol surveys conducted two years ago is unknown. The area occupied by the 433 acres that would be avoided under the proposal is an irregular polygon with a

width of approximately 1,000 feet. Any individual tortoises present in this area would still be subject to indirect effects from the project such as changes in social structure due to loss of the local population and reduction of home ranges or activity areas. The 2007 desert tortoise survey results indicate that burrow density is higher on Ivanpah 2 and Ivanpah 1 than on Ivanpah 3. Despite these facts, the SDEISmakes the extraordinary and unsubstantiated claim that for the Mitigated Ivanpah 3 Alternative which reduces the Ivanpah 3 plant by 433 acres "would have greater anticipated benefit than reduction in project footprint in other locations". SDEIS at 36.

Comment Supp-19-6: Defenders encourages BLM to take the steps necessary, including comprehensive desert tortoise surveys in the Modified I-15 Alternative area, to determine the quality of the habitat. Additionally, BLM has identified visual resources and recreation as resource areas that would be difficult to mitigate if the Modified I-15 alternative is implemented. While we appreciate the agency's mandate to manage for multiple use, we believe the impacts to biological resources are more significant than the impacts on visual resources and recreation.

***Response**: The text in the FEIS has been revised to include both the actual number of tortoises identified in the surveys, and an estimate of the actual number based on other estimating methods.*

Tortoise - Connectivity

Comment Supp-13-6: Connectivity between desert tortoise populations is essential to maintain gene flow and genetic heterogeneity (Hagerty, 2008). The FSA/DEIS mentioned connectivity but provides no discussion or analysis. At least the FSA/DEIS mentioned connectivity; the SDEIS completely ignores the effects of the two "new" alternatives on connectivity altogether.

According to the *Draft Revised Desert Tortoise Recovery Plan* (at 46), connectivity between the Northeastern Mojave and Eastern Mojave desert tortoise ESUs is provided by the Mountain Pass area in California. Disruption of this connectivity poses a threat to the genetic diversity of the Mojave population as a whole. Because all three alternatives for the proposed project will impact tortoises in the area identified as providing this essential connectivity, impacts to connectivity between the tortoises in the Northeastern Mojave Recovery Unit and the adjacent Eastern Mojave Recovery Unit must be considered and fully addressed. The Ivanpah Valley desert tortoise population is threatened with isolation from tortoises in the rest of the Northeastern Mojave Recovery Unit by existing and proposed developments in Nevada's Primm Valley. The BLM must also consider connectivity between the Ivanpah Valley desert tortoise population and the rest of the Northeastern Mojave ESU. We had requested this in our February 11, 2010 letter.

Comment Supp-13-7: Fragmentation of occupied desert tortoise habitat results in smaller, isolated desert tortoise populations that become increasingly susceptible to

negative effects with decreased viability. Fragmentation is particularly problematic when population densities are low. The SDEIS recognizes that the new alternatives will fragment desert tortoise habitat but does not quantify the degree of fragmentation nor does it provide an analysis of the viability of the fragmented desert tortoise populations. The habitat in the 433 acres that will be avoided under the Mitigated Ivanpah 3 alternative is at the north end of the ISEGS project site. An additional solar power plant is proposed immediately to the east of this area, and the proposed DesertExpress railway line would pass to the north. Any desert tortoises in the avoided 433 acres would be isolated within this pocket of habitat. Indirect effects of the proposed project such as increased use by vehicles and "improvement" of dirt roads will lead to further fragmentation. The Ivanpah Valley desert tortoise population is threatened with isolation from tortoises in the rest of the Northeastern Mojave Recovery Unit by existing and proposed solar developments in the Primm Valley in Nevada. The proposed project will contribute to the fragmentation effects of these proposed and existing developments. These cumulative fragmentation effects must be considered and addressed in the FEIS.

***Response**: The impact of the proposed project on the connectivity of tortoise habitat was evaluated in the DEIS, and was one of several reasons that the Mitigated Ivanpah 3 and Modified I-15 Alternatives were evaluated in more detail in the SDEIS. The comparative evaluation of the Mitigated Ivanpah 3 and Modified I-15 Alternatives in the SDEIS included an evaluation of their relative impact on connectivity, and concluded that the Modified I-15 Alternative would be preferable in terms of maintaining connectivity.*

Tortoise – Potential Mitigation (other than Land Acquisition)

Comment Supp-4-1: [The] comment refers to BIO mitigation for Desert Tortoise. He stated that the agencies needed to require that all compensation money received should be spent on acquisition of parcels with Desert Tortoise habitat. By collecting "in-lieu" fees, who knows how the money would be spent and that it would be wasted on administrative activities that would not directly benefit Desert Tortoise.

Comment Supp-19-8: For all its in-depth discussion regarding the relative efficacies of two reconfiguration alternatives, the DSEIS does not deal with the most basic of NEPA questions – how to avoid or mitigate for impacts to biological resources. The DSEIS in several places concedes that biological impacts from the project are significant. However, the document never addresses the core problem of affecting a genetically distinct population of desert tortoises in one of the highest elevation habitats where they are found. Moreover, the DSEIS does not once mention the issue of "in-lieu" mitigation, BLM and CEC's mitigation mechanism wherein the Applicant pays into a fund to be used at a later date for habitat acquisition or enhancement. These issues are pertinent to the alternatives analysis. Depending on the alternative adopted, more or less habitat acquisition will be required. BLM stated in the FSA/DEIS its intent to require mitigation at a 1:1 ratio for desert tortoise, but did not clarify which habitat acquisition or

enhancement actions would be included. FSA/DEIS, page 1-19. Mitigation should be discussed concurrently with an alternatives analysis, as one should inform the other.

The "in-lieu fee" mitigation plan raises many questions. BLM has required a 1:1 mitigation ratio and CEC has required a 2:1 mitigation ratio. As a "nested" mitigation plan, the two agencies have jointly instituted an overall 3:1 mitigation requirement. However, the agencies have yet to identify specific habitat acquisition or enhancement actions that will fulfill the requirement. It is in BLM's interest to ensure that the in-lieu fees manifest into actual on-the-ground improvement to desert tortoise habitat. Neither the FSA/DEIS nor the DSEIS currently contain adequate information to satisfy the public's interest in ensuring that the required fees translate into demonstrated benefits to the desert tortoise and other impacted species. BLM should strongly consider using its one-third mitigation requirement to acquire or enhance suitable desert tortoise habitat within the Northeast Mojave Recovery Unit where the Ivanpah site is located. This population of desert tortoises faces multiple threats, including habitat destruction and fragmentation, predation and disease. Targeted habitat acquisition could help the species to recover. *See* 1994 Desert Tortoise Recovery Plan, page 3.

Comment Supp-11-15: In addition to translocating desert tortoise, the agencies propose an applicant funded in-lieu fee program as compensatory mitigation. The problem is the fee program does nothing to protect the Ivanpah Valley tortoise population. The record shows that desert tortoise in the Ivanpah Valley are genetically distinct and therefore warrant protections that will ensure the survival of this unique population. According to Dr. Michael Connor: " 'The Ivanpah population appears to be a distinct assemblage, differing from other California populations in its matriarchal genealogy' … desert tortoise DNA [has] identified the Ivanpah population as being very different in California …I think it's indicative of how important that particular area is." (Tr. at pp. 428, 435 (Jan. 11, 2010).)

As a practical matter, the California Department of Fish and Game has yet to even identify any specific parcels for acquisition, and has only suggested lands for acquisition outside the Ivanpah Valley. (Ex. 310 at p. 2 (proposing land acquisition generally in the Shadow and Piute Valleys, West Mojave Desert area, and Mojave National Preserve).) Nor has the applicant take any steps to ascertain whether appropriate lands are available. As a result, the environmentally superior and most economical option is to minimize the need for salvage and replacement habitat in the first place. The applicant's reduced Ivanpah 3 will not measurably reduce salvage or the need for compensatory lands.

***Response**: The EIS acknowledges that enhancement, both in the local project area and in the acquired lands, is a valuable tool in mitigation. During the SDEIS development and review period, BLM continued working the Energy Commission, USFWS, and CDFG to develop acceptable tortoise mitigation for ISEGS and other solar projects. The results of this effort are included within revised mitigation measure BIO-17 in the FEIS.*

Tortoise - Translocation – General

Comment Supp-11-14: As the record shows, translocation is not an appropriate mitigation strategy for the listed desert tortoise. Indeed, Energy Commission staff admitted, "translocation is a **salvage** operation. It's an avoidance measure trying to save the tortoise that can be saved. The entire [] site is considered a loss for supporting future desert tortoise." (Tr. at pp. 258-259 (Jan. 14, 2010).) An approach to protecting a threatened species that is nothing more than a "salvage" operation is unacceptable.

Worse, translocation does not work. The Science Advisory Committee found that desert tortoise translocation is fraught with long-term uncertainties and agencies should not consider it lightly as a management option. (Ex. 300 at 6.2-49.) Translocation is highly controversial due to the low success rates everywhere it has been attempted on any significant scale. (Ex. 942 at p.4.) The most recent evidence is the 110,000-acre expansion at the Fort Irwin military training center. Currently, DOD is translocating tortoises from two separate areas: one area is 23,000 acres and the other is 69,500 acres. (Ex. 945 at p. 9.) Biologists have been studying the completed portions of the effort for just over one year using measures of success such as survival, dispersion, burrow use, reproduction, genetic assimilation, and habitat use monitoring 216 translocated, 108 resident, and 109 control individuals. (*Id.*) The most recent results for the Fort Irwin monitored desert tortoises were issued at the Desert Tortoise Council Symposium on February 27, 2010; **the results document an overall 45% mortality level for translocated desert tortoise.** (Ex. 942 at p. 3.)

This data indicates that translocation is not an effective strategy for mitigating impacts to the desert tortoise, especially if an alternative exists that would reduce the number of tortoises salvaged. In other words, every effort must be made to eliminate or greatly minimize the need for translocation. The record shows that the Modified I-15 alternative meets this requirement because fewer tortoises occupy the lands adjacent to the interstate. According to the SEIS, "[h]istorical survey data extrapolated to this region (Berry 1984) suggest tortoise densities might be lower closer to the highway. Recent information developed in the Energy Commission proceeding showed a lower density of tortoise burrows on the Modified I-15 alternative lands. (Cashen 2010)." Thus, the only way to minimize translocating tortoises is to avoid developing the most important and densely populated habitat in the Ivanpah Valley. Again, the reduced Ivanpah 3 option does not achieve this.

***Response**: BLM agrees that translocation, on its own, is not likely to completely eliminate impacts to the tortoises that are present in the project area. Translocation is presented in the EIS as just one of several avoidance, mitigation, and compensation measures. However, given that implementation of the proposed project, if approved, would require removal of tortoises, translocation becomes a required component of the action, even if it is not expected to be 100 percent successful. Therefore, the objective of the agency is not to use translocation, on its own, as a mitigation measure. Instead, the objective is to identify the location and procedures that are most likely to maximize*

success for those tortoises that must, by the nature of the proposed project, be removed from the project area.

Tortoise - Translocation – Suitability of Translocation Area for this Purpose

Comment Supp-13-7: The SDEIS at 36 states, "Compared to the proposed project, the Mitigated Ivanpah 3 Alternative would have a reduced impact on desert tortoise by avoiding long-term impacts to 433 acres of habitat and providing an area for tortoise relocation within known tortoise habitat." However, the 433 acres is part of the site that would require the most grading and rock removal. The SDEIS does not analyze availability of friable soils for burrow construction by desert tortoises within this 433 acres. Availability of friable soils for burrow construction may restrict the carrying capacity of the site and thus its suitability as a translocation site for tortoises. The SDEIS also fails to consider the other projects proposed in the immediate vicinity of the 433 acres which would further reduce the suitability of this area for desert tortoise translocation. We refer to our February 11, 2010 letter for additional comments related to desert tortoise translocation and relocation.

BLM Handbook 1745 requires that activity plans for translocations must be site-specific and include "Site-specific and measurable vegetation/habitat population objectives which are based on existing ecological site potential/condition, habitat capability, and other important factors." Neither the DEIS nor the SDEIS adequately describe existing ecological conditions nor address the capacity of the habitat at the translocation sites to support additional tortoises.

***Response**: The Biological Assessment includes an evaluation of impacts to desert tortoises, including those associated with the translocation of individuals. It is the responsibility of the USFWS to review the document and determine, based on their expertise, whether the conclusions reached within the Biological Assessment are valid. If the USFWS agrees with the findings of the Biological Assessment, they will issue a Biological Opinion, which may include additional mitigation or conservation measures. Alternatively, if the USFWS determines there are substantive residual impacts, even with the application of additional mitigation measures, they will issue a jeopardy opinion in the Biological Opinion that would effectively prevent to the Project from moving forward as proposed.*

10.3 Biological Resources - Vegetation

Vegetation – Herbicides

Comment Supp-1-1: I was reviewing the SDEIS for the Ivanpah Solar Project and I noticed on page 239 in a section about protection of special status plants the word "herbicide" is mentioned twice in what appears to be part of the general project activities. Below is a section from page 239. Are herbicides planned for use for the

Ivanpah solar project? Where is this use described and analyzed in the DEIS or SDEIS? I have looked in some sections of the DESI for mention of herbicide use unsuccessfully. I would love any information about the planned herbicide and or pesticide in this project.

Response: *The Weed Management Plan referenced in the EIS includes appendices which provide the list of BLM-approved herbicides in California, and methods for applying them. This information was developed by BLM through the Vegetation Treatments in 17 Western States Programmatic EIS.*

10.4 Biological Resources – Other Species

Birds and Gila Monsters

Comment Supp-13-11: The NEMO Plan set the goal for special status species as "Populations and their habitats are sufficiently distributed to prevent the need for listing" (NEMO Plan at 2-6). Like the FSA/DEIS, the SDEIS fails to fully analyze impacts to gila monsters, burrowing owl, golden eagles, other bird species, bats, and other wildlife or to provide alternatives to avoid impacts, or provide measures to minimize impacts. In doing so, it fails to take NEPA's requisite hard look and fails to meet NEPA's requirements or satisfy the NEMO Plan's objectives.

Comment Supp-8-13: Both the DEIS and the SDEIS fail to adequately address the issue of impacts to migratory birds as stated in the Center's previous comments. Pursuant to the Migratory Bird Treaty Act and Executive Order 13186 as well as NEPA, the BLM was required to evaluate the effects of the proposed project (and connected actions) on migratory birds but has failed to do so. Similarly, impacts to golden eagles are not adequately addressed. The Supplemental DEIS simply states that impacts would be reduced from the former proposed alternative--- however since those impacts were never adequately identified or analyzed there is little basis for these conclusory statements. Clearly, the next revised or supplemental DEIS needs to adequately identify the migratory bird issues on site as well as impacts to golden eagles and evaluate the impact to those species.

Response*: The SDEIS included evaluation to potential impacts to each of the species addressed in this comment. The screening of alternatives in Section 4 of the SDEIS considered potential biological impacts to 25 different alternatives, and the analysis of the Mitigated Ivanpah 3 and Modified I-15 alternatives in the SDEIS compared their expected impacts on the species discussed in this comment. In addition, since publication of the SDEIS, BLM has continued to work with the Energy Commission, USFWS, and CDFG to improve the mitigation measures for these species, especially the avian species. These revised mitigation measures are included in mitigation measures BIO-22 and BIO-23.*

The FEIS also includes additional information regarding potential impacts to gila monsters.

Bighorn Sheep

Comment Supp-13-10: Like the FSA/DEIS, the SDEIS fails to fully analyze impacts to bighorn sheep, provide alternatives to avoid impacts, or provide measures to minimize these impacts. The slightly smaller size of the Mitigated Ivanpah 3 alternative does not make up for the failure to obtain and consider basic information about the use of the area by bighorn and the likely impacts to bighorn from the project.

Comment Supp-17-7: Impact: Bighorn sheep seasonally migrate from the high elevation Clark Mountain, where they generally spend the summers, to the low elevation State Line Hills, where they spend the winter and where they lamb. The project will have uncertain impacts on the bighorn sheep migration between these two sites and their continued use of them.

Potential Mitigation
Project should fund a study to trap and collar bighorn, map their habitat and potential habitat, and monitor their movements and reaction to the project.

***Response**: In response to these comments, BLM conducted additional analysis of impacts to bighorn sheep in the SDEIS. This analysis is included in the FEIS.*

General Wildlife Movement/Connectivity/Habitat

Comment Supp-8-14: As noted by the Center, BLM did not address the value of the habitat that would potentially be lost and fragmented in a comprehensive way. There are several ways in which BLM could approach analyzing such impacts. One way to analyze impacts to habitat used by NOAA is to perform a Habitat Equivalency Analysis ("HEA"). This process is used to determine compensation for injuries to the public trust environmental resources including the lost services that the ecosystem provides. While the HEA was developed for determining compensation from impacts primarily from oil spills, this methodology has been used to determine compensation for other types of impacts including development projects. It is a useful method to determine compensation for impacts to the public trust resources including migratory birds, golden eagles, and other biological resources that would occur if the proposed project is implemented. It can also provide a basis for analyzing the equivalency of compensation lands at least from the resources services perspective. This analysis would be *in addition to* mitigation for the impacts to threatened and endangered species. We suggest that BLM consider utilizing this methodology to more accurately analyze and assess the impacts from the proposed project and the alternatives on the resources of our public lands.

***Response**: The analysis of impacts to specific species in the FEIS includes consideration of the impact of the proposed project and alternatives on habitat connectivity.*

14.0 CULTURAL RESOURCES AND NATIVE GROUP COORDINATION

Comment Supp-2-1: Having received the SDEIS for the SIEGS project, Chairman Valenzuela was concerned about impact to prehistoric or tribal sites and asked if archeological surveys of the project lands had been conducted. [He was assured that no prehistoric sites had been identified during the various surveys (only a partial survey in new lands), that none were expected and told him that I would let him know if any were identified in the new project lands.

***Response**: The comment is a telephone record of a conversation between Chairman Valenzuela and BLM staff. Chairman Valenzuela's concerns were addressed in the phone conversation, as documented in the telephone record.*

15.0 FIRE, SAFETY AND HAZARDOUS MATERIALS

Comment Supp 3-1: The Department of Toxic Substances Control (DTSC) has received your submitted Supplemental Draft Environmental Impact (SDEIS) for proposed Ivanpah Solar Electric Generating System (ISEGS) project. The following project description is states in your document: " The SDEIS analyses two additional alternatives to the proposed action; a reduction in acreage alternative called the Modified I-15 Alternative. The facility evaluated in each of these alternatives is a thermal electric generating facility with generating capacity of 370 megawatts (MW). The Mitigated Ivanpah 3 Alternative would be a development of three solar concentrating thermal power plants, which are comprised of fields of heliostats (elevated mirrors guided by a tracking system) focusing solar energy on boilers located on centralized power tower. Shared facilities consisting of substation, administrative and maintenance buildings would be developed during construction of the first power plant in the Construction Logistics Area (CLA) between Inanpah 1 and 2. Overall, the Mitigated Ivanpah 3 Alternative would require a Bureau of Land Management (BLA) right of way (ROW) grant totaling 3564.2 acres, a reduction of 12.5 percent or 433 acres. The Modified I-15 Alternative would also occupy 3564.2 acres, but the arrangement of one of the three power generating units would be configured and placed closer to Interstate 15 (I-15). The Mitigated Ivanpah 3 Alternative would be located in the Mojave Desert, near the Nevada border in San Bernardino County, California on land administered by BLM. The Mitigated Ivanpah 3 Alternative site is located 4.5 miles southwest of the Primm, Nevada, and 0.5 miles west of the Primm Valley Gold Club which is located just west of the Ivanpah Dry Lake. The land uses associated with the site vicinity and proposed project property includes undeveloped lands, recreation, grazing, mineral development and use of designated utility corridors for natural gas and electricity transmission." DTSC has the following comments:

1) The SDEIS should identify the current or historic uses at the project site that may have resulted in a release of hazardous wastes/substances, and any known or potentially contaminated sites within the proposed Project area. For

all identified sites, the SDEIS should evaluate whether conditions at the site may pose a threat to human health or the environment. Following are the databases of some of the pertinent regulatory agencies:

- National Priorities List (NPL): A list maintained by the United States Environmental Protection Agency (U.S. EPA)
- Envirostor: A database primarily used by the California Department of Toxic Substances Control, at Ebvirostor.dtsc.ca.gov
- Resource Conservation and Recovery Information System (RCRIS): A database of RCRA facilities that is maintained by U.S. EPA.
- Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS): A database of CERCLA sited that is maintained by U.S. EPA.
- Solid Waste Information System (SWIS): A database provided by the California Integrated Waste Management Board which consists of both open as well as closed and inactive solid waste disposal facilities and transfer stations.
- Leaking Underground Storage Tanks (LUST)/Spills, Leaks, Investigations, and Cleanups (SLIC): A list that is maintained by Regional Water Quality Control Boards.
- Local Counties and Cities maintain lists for hazardous substances cleanup sites and leaking underground storage tanks.
- The United Stated Army Corps of Engineers, 911 Wilshire Boulevard, Los Angeles, California, 90017, (213) 452-3908, maintains a list of Formerly Used Defense Sites (FUDS).

2) The SDEIS should identify the mechanism to initiate any required investigation and/or remediation for any site that may be contaminated, and the government agency to provide appropriate regulatory oversight. If necessary, DTSC can enter an oversight agreement in order to review such documents.
3) All environmental investigations, sampling and/or remediation for the site should be conducted under a Workplan approved and overseen by a regulatory agency that has jurisdiction to oversee hazardous substance cleanup. The findings of any investigations, including any Phase I or II Environmental Site Assessment Investigations should be summarized in the document. All sampling results in which hazardous substances were found should be clearly summarized in a table.
4) Proper investigation, sampling and remedial actions overseen by the respective regulatory agencies, if necessary, should be conducted at the site prior to the new development or any construction. All closure, certification or remediation approval reports by these agencies should be included in the AFC.
5) Buildings or other structures, asphalt or concrete-paved surface areas are being planned to be demolished, an investigation should be conducted for the presence of other related hazardous chemicals, lead-based paints or

products, mercury, and asbestos containing materials (ACMs). If other hazardous chemicals, lead-based paints or products, mercury or ACMs are identified, proper precautions should be taken during demolition activities. Additionally, the contaminants should be remediated in compliance with California environmental regulations and policies.

6) Project construction may require soil excavation or filling in certain areas. Sampling may be required. If soil is contaminated, it must be properly disposed and not simply placed in another location onsite. Land Disposal Restrictions (LDRs) may be applicable to such soils. Also, if the project proposes to import soils to backfill the areas excavated, sampling should be conducted to ensure that the imported soil is free of contaminations.
7) Human health and the environment of sensitive receptors should be protected during the construction or demolition activities. If it is found necessary, a study of the site and a health risk assessment overseen and approved by the appropriate government agency and a qualified risk health assessor should be conducted to determine if there are, have been, or will be, any releases of hazardous materials that may pose a risk to human health or the environment.
8) If it is determined that hazardous wastes are, or will be, generated by the proposed operations, the wastes must be managed in accordance with the California Hazardous Waste Control Law (California Health and Safety Code, Division 20, Chapter 6.5) and the Hazardous Waste Control Regulations (California Code of Regulations, Title 22, Division 4.5). If it is determined that hazardous wastes will be generated, the facility should also obtain a United States Environmental Protection Agency Identification Number by contacting (800) 618-6942. Certain hazardous waste treatment processes or hazardous materials, handling, storage or uses may require authorization from the local Certified Unified Program Agency (CUPA). Information about the requirement for authorization can be obtained by contacting your local CUPA.
9) If during construction/demolition of the project, the soil and/or groundwater contamination is suspected, construction/demolition in the area should cease and appropriate health and safety procedures should be implemented.
10) If the site was used for agricultural, livestock or related activities, onsite soils and groundwater might contain pesticides, agricultural chemical, organic waste or other related residue. Proper investigation, and remedial actions, if necessary, should be conducted under the oversight of and approved by a government agency at the site prior to construction of the project.
11) DTSC can provide guidance for cleanup oversight through an Environmental Oversight Agreement (EOA) for government agencies which could not be responsible parties under CERCLA, or a Voluntary Cleanup Agreement (VCA) for private parties ...

Response: *The information from DTSC generally requests that site evaluation include standard procedures to identify and address the potential presence of hazardous materials on the subject property. The text in the DEIS sections on Public Health and Safety (Page 6.7-10 of the DEIS) and Waste Management (Page 6.13-6) discuss the*

Phase I Environmental Site Assessment conducted at the subject property for this purpose.

17.0 GRAZING

Comment Supp-17-11: Impact: The project area is removing 4,000 or more acres from an active cattle grazing allotment. The east half of the Clark Mountain unit is part of this grazing allotment and includes most of the water in the area for cattle. There is some potential that the cattle will spend more time on the NPS lands, which are higher elevation and generally better forage quality. Also, the tortoises present within the project area are to be translocated outside the fence onto adjacent habitat. Cattle grazing and feral burros could threaten the survival and recovery of the tortoise in this area.

Potential Mitigation

Cattle grazing should be removed from all tortoise habitat in the vicinity of the project so that translocated tortoises are not competing with cattle for food.

Project should purchase the lost AUM's from the permittee and the BLM should reduce the total AUM's on the permit.

New fences should be funded by the project to move the allotment boundary and exclude tortoise habitat (and not impact bighorn sheep movement).

Project should install water source on lower elevation BLM lands to encourage the cattle to utilize areas of the allotment equally.

Project should fund the installation of wildlife friendly fencing of springs in the Preserve and placement of watering device outside the fence for cattle to utilize.

Comment Supp-8-11: As noted previously, impacts to late summer and fall flowering plants are not adequately identified or analyzed in either the DEIS or Supplemental DEIS. The Supplemental DEIS also fails to provide the needed identification and analysis of impacts from proposed changes in grazing and road and route realignments that are contemplated as part of the proposed project. For example, regarding changes in grazing the Supplemental DEIS does not actually evaluate the changes but rather defers the issue to a future time in violation of NEPA. The Supplemental DEIS states:

> The procedures and regulations that would be used by BLM to modify allotment boundaries and reduce the animal unit months (AUMs) permitted in the grazing lease would be the same for the proposed project and the Mitigated Ivanpah 3 Alternative. . . .

> The proposed project would require that BLM modify the allotment boundaries, and reduce the number of AUMs available within the allotment, currently a total of 1,428 AUMs, by approximately 70 AUMs."

SDEIS at 95. However, the Supplemental DEIS, like the DEIS, does not explain how changes in the grazing AUMs this would impact the resources of these public lands or how ongoing or reduced grazing would impact the tortoises that are proposed to be translocated into the areas that would still be grazed. At minimum the BLM needed to consider an alternative that would protect translocated tortoises and host tortoise which will be under increased stress from forage competition and other impacts due to grazing. The Center raised this issue in our comments on the DEIS and it remains unaddressed.

***Response**: The text in the FEIS has been modified to provide more information on the reduction of AUMs.*

19.0 NOISE

Comment Supp-17-2: The discussion of Noise and Vibration impacts in Section 4.6 starting on page 58 fails to state the level of noise in decibels that would occur and fails to address how far that noise would carry beyond the project site. NPS sound monitoring on Clark Mountain indicates the area is extremely quiet. Noise impacts could travel long distances and without specifics we can only assume that noise could adversely affect recreation visitors to the Mojave National Preserve.

Comment Supp-17-9: Impact: The Clark Mountain wilderness has some limited natural sound data that shows a very quiet wilderness experience currently exists on most days. Construction of the project site will generate considerable noise from heavy equipment that will disrupt the natural soundscapes. This will be of concern to the climbing community and other recreationists on the Clark Mountain (especially on the limestone faces, where presumably the noise will bounce off these shear walls) that noise will carry into the adjacent wilderness area and impact the recreational experience. We are also concerned about routine repetitive noises during the 30 year life of the project that may display species that communicate in those same audio ranges. In addition to the long term impact on the climbing community and other recreationalists, insects or birds could also be adversely affected in the area where the noise is audible, greatly increasing the impact footprint of the facility.

Potential Mitigation

Project should fund the monitoring of sound in the Preserve and be required to mitigate noise impacts if any are detected.

***Response**: The FEIS text has been revised to add information regarding the impact of noise on the Preserve. The analysis of biological impacts in the SDEIS acknowledged that noise could cause adverse imp[acts to wildlife. Section 4.7 includes mitigation*

measures intended to reduce noise levels, and to limit the timing of noise-generating activities.

20.0 PROJECT DESCRIPTION

20.1 Project Description – Grading

Comment Supp-8-12: The identification and description of the amount of grading for the proposed project remains inadequate and this omission undermines the analysis of air quality impacts from PM10 as well as the analysis of impacts to soils and water. The Supplemental DEIS, as the DEIS did, grossly understates the amount of grading that will occur on the site and conflates so-called "heavy" grading with all grading. While the specific information about a grading plan may be deferred to the construction plan in some instances (*see* SDEIS at 256), the likely *extent* of grading on the site must be disclosed as part of the NEPA review as it is a critical component needed to assess impacts to soils, water, and air quality. The BLM's failure to include this information undermines the NEPA analysis here.

***Response**: The analysis of air quality impacts associated with grading and operations has been based on very conservative assumptions, including extensive grading and full removal of all vegetation. Any vegetation that survives as a result of the Low-Impact Development approach would reduce potential impacts even further.*

23.0 SOIL AND WATER

23.1 Soil and Water - Surface Water/Stormwater

Comment Supp-20-6: The SDEIS does not provide detailed information about 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 artic1e1 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 with this Project.

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.

***Response**: Following the selection of the Low Impact Development approach to minimize modification of the site's natural hydrology, the agency remained concerned about the potential for stormwater flows to damage fencing and heliostats, and as a*

result, developed a mitigation measure: SOIL & WATER-5 requires the development of a Stormwater Monitoring and Response Plan to monitor the site for stormwater damage, and to take corrective actions in response to identified damage. The mitigation measures specifically requires inspection of fencing, corrective actions to identified damage, and consideration of more active stormwater management systems if unacceptable impacts occur.

24.0 TRAFFIC

Comment Supp-16-1: As you know, CCDOA previously filed comments on the Draft Environmental Impact Statement (DEIS) for the Ivanpah Solar Electric Generation System. In its comments, CCDOA identified four key concerns with the DEIS: (1) glare; (2) thermal effects; (3) adherence to the Ivanpah Lands Act (Public Law 106- 362); and (4) recognition of FAA's prior comments.

While the purpose of the Supplemental DEIS (SDEIS) was to analyze two new alternatives to the proposed action, CCDOA is disappointed that BLM did not use this as an opportunity to address
CCDOA's comments, particularly its serious concerns regarding the use of unjustified thresholds for significance for safety impacts associated with glare from the proposed heliostats. As noted below, CCDOA still has strong concerns on these matters. In addition, CCDOA has identified several other, more minor issues, in the SDEIS that merit brief comment. These issues merit full consideration and response before BLM issues its Final EIS.

Comment Supp-16-3: The analysis of the effects of the Modified 1-15 Alternative should better account for the effects on Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) aviation traffic. Because many VFR aircraft use 1-15 as a navigation route, the Modified 1-15 Alternative could result in greater impacts from heliostat glare, power towers and turbulence. The analysis should start with and include maps showing the location of VFR and IFR routes in relationship to the project alternatives. *(Compare,* SDEIS at pp. *164-5).*

Comment Supp-16-4: The heliostat positioning plan should be actually drafted and circulated for comment prior to the completion of the EIS and the relevant federal actions. The SDEIS assumes, without basis, that the impacts would be mitigable with little or no supporting analysis. The plan should be developed now and made available in a second SDEIS to ensure that full information on the potential safety effects are considered prior to action on the project and with full opportunities for public notice and comment. *(Compare,* SDEIS at pp. 268-69).

Comment Supp-16-5: CCDOA reiterates its request that BLM consult with FAA about the potential effect of the thermal plumes from the air cooled condensors on air navigation and on the potential turbulence hazards. This issue is not addressed in FAA's determinations of no hazard (which relate to height obstructions only). As noted

in CCDOA's earlier comments, the only way BLM can meet its mandate to properly evaluate potential effects to public health and safety is to consult with FAA on this issue and inform the public of the results of that consultation.

A discussion of the potential public safety issue of thermal updrafts that could potentially interfere with operation of light general aviation aircraft should be included in the discussion of each alternative. *(Compare* SDEIS at pp. 62 and 151 (public safety analysis) and pp. 75, 76 & 164-65 (traffic and transportation analysis)).

Comment Supp-16-6: CCDOA reiterates its comment that BLM does, in fact, have legal obligations under Public Law 106-362. Specifically, BLM cannot ignore the congressional concern regarding the shortage of airspace in the Las Vegas region; this is clearly a cumulative impact that must be addressed in the EIS. It would be arbitrary and capricious to examine the effects ofthe project on surface transportation capacity and congestion and then fail to do so with air routes and airspace capacity. To that end, BLM must coordinate with FAA to determine the degree to which the ISEGS may impact existing and planned flight tracks in the region.

Comment Supp 16-7: • The SNSA Site is not located in Jean, Nevada. *(Compare* SDIES at p. 29, 1st paragraph and p. 120, last paragraph). It is located in unincorporated Clark County, Nevada, between the communities of Jean and Primm, Nevada.

- The SNSA site is not 5,000 acres *(Compare* **SDEIS** at p. 46, **§** 4.2.4 and p. 135, **§** 6.2.5). As described in BLM Patent no. 27-2004-0104, the Southern Nevada Supplemental Airport site is approximately 5,752.33 acres.

- CCDOA reiterates its recommendation that the Final EIS include FAA in the list of regulatory agencies that administer laws, ordinances, regulations or standards that may be applicable to the proposed project; and that BLM include FAA's 2008 letter to Mr. George Meckfessel in the Table of scoping comments received by the agency on this project.

***Response**: The potential impact of thermal plumes on low-flying aircraft was evaluated on Page 6.10-22 of the DEIS. In response to the potential impact, the DEIS proposed Mitigation Measure TRANS-6, which requires the applicant to conduct additional coordination with FAA. In addition, the DEIS proposed a Mitigation Measure (TRANS-3) requiring a Heliostat Positioning Plan. In response to these comments, BLM contacted FAA to request additional coordination. As of the publication of the FEIS, the additional information from FAA has not been received.*

The specific comments regarding the acreage of the Southern Nevada Supplemental Airport and the inclusion of the FAA information have been addressed through text changes in the FEIS.

Comment Supp-17-13: Impact: The primary access road from the east onto Clark Mountain currently crosses a mostly undeveloped desert bajada, once you get beyond

the golf course area. That road will have to be moved because it is in the middle of the project. The experience of driving across this desert bajada enroute to Clark Mountain will be significantly changed from one of a natural desert experience to more of a industrial development zone. In addition, the freeway exit at Yates Well Road where the access begins is now subject to a new California Port of Entry proposal, so just moving the access road now around the solar project may mean rerouting it again in a couple of years if this project gets approved.

Potential Mitigation

We recommend looking at creating a new road using the Nipton Road exit and skirting the foothills above tortoise habitat to create a new access road to Clark Mountain.

In addition to improving the access for recreationists, a wayside pullout and restroom could be developed at this exit that could have interpretive panels providing information about the solar project. This site would provide a good overview of the project and could be used for public education about renewable energy.

Response: *The modifications to the access roads between the golf course and the mountains to the west of ISEGS are minor, and are not expected to impede access. Consideration of replacing these routes with other routes is not necessary.*

25.0 VISUAL RESOURCES

Comment Supp-13-13: Visual resources are important public resources identified in both FLPMA and the CDCA Plan. The Clark Mountains, part of the Mojave National Preserve, rise to almost 8,000 feet from the Ivanpah Valley and view of the mountains from the valley will be marred by the ISEGS project's power towers, each rising to 459 feet above the valley and array of 428,000 mirrors. Scenic views from two wilderness areas (Mesquite and Stateline) will also be adversely affected. Hundreds of thousands of visitors pass through the Ivanpah Valley annually. While most of these simply pass through along the major highways, many visitors do stop to visit, use and enjoy the Ivanpah Valley's public lands, Mojave National Preserve, Wilderness Areas, and recreation areas. The two alternatives proposed in the SDEIS will significantly impact visual resources for these visitors. In the SDEIS and FSA/DEIS the BLM has failed to identify alternatives or mitigation measures that will avoid these impacts other than the "no action" alternative.

Comment Supp-16-2: The DEIS does not conclude that there would be no safety hazard associated with brightness. It concludes only that retinal damage from instantaneous exposures would not occur. Importantly, the DEIS also recognized the potential for longer-term harms. The DEIS analysis referenced in the SDEIS was based on the unsupported assumption that pilots and others would avert their gaze from the proposed project and thereby avoid injury on the grounds that any exposures would be transient. This assumption is entirely insufficient to address potential public safety

concerns. First, the basic assumption is simply false, insofar as pilots do not have the ability to simply not look at the flight environment. Pilots operating under visual flight rules and instrument flight rules have a legal and moral obligation to vigilantly observe the entire sky to see and avoid other aircraft, as well as to maintain adequate separation from obstacles on the ground. *See e.g.,* 14 C.F.R. § 91.113(b) ("vigilance shall be maintained by each person operating an aircraft so as to see and avoid other aircraft."). Pilots must also maintain views of the horizon to ensure proper control and navigation. Second, BLM' s "retinal injury" standard fails to take into account the obvious resulting safety hazard, namely pilots who will be averting their eyes rather than maintaining visual contact with the flight environment. Again, this is a legal and safety imperative, not a pleasant luxury. Third, the DEIS was based on the wholly unsupported assumption that the duration of exposure to pilots would be very short because light would be reflected at a constant stationary angle and the viewer would be travelling at a high rate of speed. This is neither quantified nor supported. Further, the SDEIS argument disregards the fact that the pilot would be exposed to the glare from each heliostat, possibly in sequence, which could dramatically increase the duration. Finally, as noted in our earlier comments, the use of retinal injury as the threshold inquiry for public safety is entirely inadequate, particularly given BLM's admission that pilots will be distracted. While causing distraction to hikers in the nearby mountains may not rise to the level of a public safety threat, causing distraction to pilots engaged in final approach or the initial stages of departure is another thing altogether and merits full examination in the Final EIS. *(Compare,* SDEIS at pp. 75, 76 & 164-65).

Comment Supp-17-3: Page 80 under visual resources is the first time that the supplemental DEIS recognizes the existence of the Mojave National Preserve. The DEIS acknowledges substantial adverse impacts to scenic resources, including the Preserve. These impacts are acknowledged as being adverse and unavoidable. Since these impacts are recognized as being unmitigatable, the NPS proposes that the applicant be required to compensate for these impacts. See our proposed mitigation measures below.

While the artist's rendering in figure 4-1 on page 82 shows the basic scale of the project footprint, it tends to significantly downplay the visual effect. Major parts of the rendering barely show any visibility of the thousands of heliostats on the south side. The north side of the rendering also does little to recognize the significant solar glare that will occur at times. These images do little to show the real visual impact of the project.

Comment Supp-17-12: Impact: The CEC staff assessment and BLM DEIS concludes unmitigatable significant impacts on visual resources. If this statement is true, we believe the project should be required to compensate for this significant impact on this public resource that Congress has recognized as significant to conserve. The NPS has experts in determining the value of a lost resource and could help determine an appropriate compensation amount.

Potential Mitigation

Establish a value for the required compensation and set up a fund for mitigation projects. Establish an interagency and public committee to determine criteria and appropriate projects to fund in the Ivanpah Valley and nearby on NPS or other public lands to offset this loss.

***Response**: As stated in the comments, the EIS states that direct adverse impacts to visual resources will occur, and cannot be mitigated. This information has been considered by BLM in the selection of a preferred alternative in the FEIS, and will be considered in the decision whether or not to authorize the ROW grant in the Record of Decision.*

Comment Supp-17-10: Impact: Arguably the project will not be the most significant impact on night skies in the Ivanpah Valley, given the presence of the Primm Casino and Hotel development. However, in order to ensure that the light pollution doesn't degrade any further in close proximity to the Preserve steps should be taken to minimize the impact.

Potential Mitigation

All external lighting should be shielded and shut off when not needed. Lights that are motion activated could be used to prevent lights from remaining on all night.

***Response**: The text in the FEIS regarding the impact of night-lighting has been revised.*

26.0 WILD HORSES AND BURROS

Comment Supp-13-9: The SDIES is incorrect in asserting that "wild horses are not present in the project area". There is at least one stallion present (photographs available on request) that was described by the grazing permittee as having been present for several seasons. Although the BLM has established the AML for burros in the Clark Mountain HMA at zero, there are many burros on the site that will be impacted. BLM cannot simply pronounce that because they have established a zero AML, wild horses and burros will not be impacted by any of the alternatives. BLM must address the actual impacts to the resident wild horse and burro population.

***Response:** The comments regarding other actions associated with burros in the Clark Mountain Herd Area are appreciated. The purpose of the EIS was to evaluate the specific impact of the proposed ISEGS project on the burros in the area. However, other management decisions regarding this herd are outside of the scope of this project-specific EIS.*

Comment Supp-17-8: Impact: Invasive species. Feral burros still exist in the area and are known to utilize the proposed project site. Fencing of this site may force the burros

onto the park more often. Disturbance of the site will provide a substrate that is suitable for additional invasive plant species to expand their area or get a foothold, bringing the threat close to the park where wind or avian transport could introduce these into the Clark Mountain wilderness area.

Potential Mitigation

Project should fund the removal of the remainder of the feral burros from the herd management area, which is to be zeroed out according to the BLM NEMO plan. Project should be required to have an invasive species management plan that includes the NPS lands

Response: *The comments regarding other actions associated with burros in the Clark Mountain Herd Area are appreciated. The purpose of the EIS was to evaluate the specific impact of the proposed ISEGS project on the burros in the area. However, other management decisions regarding this herd are outside of the scope of this project-specific EIS.*

Appendix B-1
Biology Appendices

Biological Resources Appendix A

Table A-1
Percentage of Statewide Documented Element Occurrences[1] for Special-Status Plant Species in the ISEGS Project

Name Scientific (Common)	CDFG's CNDDB Rank Global/State and CNPS List	Total Documented Occurrences in CNDDB* (including project occurrences)	Additional Occurrences from Consortium of California Herbaria**	Occurrences From Other Available Data (other projects)***	Project Site Occurrences (as reported by CNDDB 8/2009)	Project Site % of Documented Occurrences in California (List 2 plants) or Globally (List 1B)
Androstephium breviflorum (**small-flowered androstephium**)	G5 S1.2, List 2.2	82	0	1	3	3/(82+1) = 4%
Asclepias nyctaginifolia (**Mojave milkweed**)	G4G5 S1, List 2.1	22	1	1	16	16/(22+1+1) = 67%
Coryphantha chlorantha (**desert pincushion**)	G2G3 S1, List 2.1	22	1	n/a	8	8/(22+1) = 35%
Enneapogon desvauxii (**nine-awned pappus grass**)	G5 S2, List 2.2	21	0	1	3	3/(21+1) = 14%
Grusonia parishii (**Parish's club-cholla**)	G3G4 S2, List 2.2	16	0	1	5	5/(16+1) = 29%
Sphaeralcea rusbyi var. *eremicola* (**Rusby's desert-mallow**)	G4T2 S2, List 1B.2	29	4	n/a	7	7/(29+4) = 21%

* Number of CNDDB element occurrences (August 2009 update)
** Number of occurrences derived from herbarium records, California Consortium of Herbaria
*** Number of occurrences derived from EA for the SCE El Dorado to Ivanpah 220 kV transmission line project

Global Rank is a reflection of the overall condition of an element throughout its global range:

G2—Imperiled At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors;

G3—Vulnerable At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors;

G4—Apparently Secure Uncommon but not rare; some cause for long-term concern due to declines or other factors;

G5— Secure Common; widespread and abundant.

Some of the G-ranks above are expressed as a range. Subspecies receive a T-rank attached to the G-rank. The G-rank refers to the whole species range, but the T-rank refers to the global condition of variety *eremicola* only.

[1] The term "Element Occurrence (EO)" refers to populations or groups of individuals occurring in close proximity to each other, and is defined by the CNDDB as individuals of a particular species occurring within one-quarter mile of each other. When numerous localities are documented by a reporter within very close proximity of each other, CNDDB uses this standardized and nationally accepted mapping convention, which allows a common metric for comparison, using a quarter-mile grid. Data provided to CNDDB by the applicant (CH2M Hill 2008c, Table 5-1) were mapped by CNDDB using this convention into the number of EOs shown in the column "Project Site Occurrences as reported by CNDDB 8/2009." These numbers should not be confused with numbers of individual plants.

State Rank:

S1— Critically Imperiled	Critically imperiled in the state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province;
S2— Imperiled	Imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province;
S3— Vulnerable	Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation; Indicates some uncertainty about the rank.

State Rank Extension: 0.2—threatened

Table A-1 describes the status of the special-status plants found within the project footprint in terms of Element Occurrences (EOs) rather than numbers of individual plants. An EO is defined by CDFG's CNDDB as individuals of a particular species occurring within one-quarter mile of each other. Due to incomplete data, contributors to the CNDDB sometimes do not note the number of individuals when reporting CNDDB EOs and herbaria records, and the occurrence size in terms of individual plants cannot be ascertained. To provide a common metric for comparison with the CNDDB and herbarium data, Table A-1 expresses the occurrences of special-status plant species found on the ISEGS site during the 2007 and 2008 surveys in terms of EOs. Utah vine milkweed and desert portulaca are not included because they are not mapped in the CNDDB, as is the case for most CNPS List 4 plants.

BIOLOGICAL RESOURCES APPENDIX B:
Issues to Address in the Closure,
Revegetation and Rehabilitation Plan

Staff has reviewed the *Closure, Revegetation and Rehabilitation Plan for the Ivanpah Solar Electric Generating System, Eastern Mojave Desert, San Bernardino County, California*, June 2009 (CH2M Hill 2009q) and identified the following issues that need to be addressed in revisions to this document.

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D.
Chambers Group, Inc.
Based on 2009-06-29_Applicant_Data_Response_Set_2K_TN-52208
(Data_Response_Set_2K).

Policies

General

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Reference in Data_Response_Set_2K:

Approach: Key future actions will be cut and pasted with "will" substituted for might, should, etc.

Proposed Wording of Condition: future actions will be cut and pasted with "will" substituted for might, should, etc.

End use of the ROW after ISEGS closure

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Vague language

Reference in Data_Response_Set_2K: 1.1

Approach: The end use of the property 50 years from now is quality habitat of the types impacted by construction and operation. Contracts and permits may be amended by mutual agreement, but the current standards conform to laws and guidelines now in effect.

Proposed Wording of Condition: The objective of the revegetation plan and all related activities shall be re-creation of the types of habitat lost during construction and operation

of the proposed solar energy facility. No project approvals will be issued, nor shall any plans or applications be based on other potential end uses of the property.

Shading from Mirrors

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Reference in Data_Response_Set_2K: This topic is not discussed in the draft.

Approach: Point out that shading from the mirrors is serious and can lead to competitive disadvantages to plants with the crassulacean acid metabolism photosynthetic pathway (CAM).

Proposed Wording of Condition: The fraction of the land surface that is to be occupied by mirrors will have an impact on the vegetation. Shading has selective effects on wavelengths of light that are critical to desert plants that have crassulacean acid metabolism (CAM). These plants include many succulents. Shading will inhibit growth and reduce competitive ability of CAM plant species and is considered an impact under these Conditions of Approval. Native CAM plant species that are subject to shading will be moved to a succulent storage area or an unshaded portion of the operations area. Under no circumstances shall salvaged succulents be stored within Special-Status Plant Protection Areas. Any such moves of CAM plants not already approved under other Conditions of Approval shall be specifically verified in writing by BLM or its designated representative.

Submittal of final closure, revegetation, and rehabilitation plan

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Vague language

Reference in Data_Response_Set_2K: 7.1

Approach: Specify the importance of the final plan.

Proposed Wording of Condition: The Final Closure, Revegetation, and Rehabilitation Plan (final closure plan) shall be submitted and approved by BLM prior to issuance of the permit.

STANDARDS

Introduction of mid to late successional vegetation

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: the argument against introduction of late stages of succession during the restoration effort.

Reference in Data_Response_Set_2K: 7.3.1

Approach: Draw upon examples in which later stages of succession have been introduced, and provide standards to assure an effort to introduce plants other than ruderals.

Proposed Wording of Condition: Later stages of vegetation are not impossible to establish, and late successional species can be introduced at the same time as early stage species. Late stage species are often more dependent upon soil biological conditions and soil structure but can be successful in a mixture with early stage species. Performance standards

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: The low threshold being proposed for project success in Data_Response_Set_2K. Performance standards currently proposed by the applicant will not define a successful restoration project.

Reference in Data_Response_Set_2K: 7.8.1, Table 7-6

Approach: Specific and more stringent standards for project success;

Proposed Wording of Condition: Within each mapped pre-disturbance vegetation type, success criteria will be achieved as defined by performance and abundance of native and exotic plant species. Native plants in the vegetation shall reach over the first 10 years of growth 80 percent of the initial density, absolute cover, and species richness, with progressive improvement during the 10-year period. Exotic species shall reach over the first 10 years of growth no more than 4 times the absolute cover of exotic plants in the original vegetation. Every effort shall be made to minimize invasion by exotic species, and the performance standards shall include a maximum allowable cover of exotic species.

Standard for weed cover

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Lax weed cover standards

Reference in Data_Response_Set_2K: 3.5.3 and 7.3.1.1

Approach: Reduce tolerance for weedy species in the revegetation effort

Proposed Wording of Condition: The vegetation to be introduced to the site shall consist entirely of plant species native to the northern Mojave Desert. No exotic plant species shall be included on the seed lists nor introduced with native species. Exotic

species, regardless of their presence in the original vegetation, shall not be counted as successful vegetation establishment.

MONITORING

Baseline vegetation surveys

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Restoration surveys are not suitable for planning the restoration effort.

Reference in Data_Response_Set_2K: 3.5.4

Approach: Requirement for vegetation surveys that can guide restoration planning. There will have to be thorough sampling within each vegetation type. The current plan provides fewer transects than there are vegetation types.

Proposed Wording of Condition: Pre-construction surveys of all vegetation on the subject sites shall be carried out in a manner able to guide restoration efforts and provide baseline measurements for judging project success. The entire proposed project area shall be divided into vegetation types as described by Sawyer and Keeler-Wolf. The boundaries of each vegetation type shall be mapped to GPS accuracy of one meter or less and provided to BLM as a series of shape files. Each vegetation type will have soil, terrain, exposure, elevation, and slope clearly indicated. For each vegetation type provide a list of perennials and appropriate annuals. Surveys shall be performed at a season when the year's annuals are identifiable; generally from early March through late April. Survey methodology should emphasize accuracy rather than precision. Generally it is preferred to record a large number of rapid determinations rather than a small number of detailed determinations. BLM will accept rapid methods such as the step-point method (Bonham 1988) provided transects are laid out in a manner that captures the true composition of the vegetation. The combined length of step-point transects in each vegetation type shall approximate the square root of the area of the vegetation type or at least 400 intercepts and shall be laid out to give unbiased representation of all portions of the vegetation type. Vegetation need not be divided into herb and shrub layers as long as all species intercepted by points are included in the survey. Additional species not encountered on the transects shall be recorded separately on a diversity list.

Maintenance monitoring schedule

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Maintenance monitoring schedule must be frequent during early stages

Reference in Data_Response_Set_2K: 7.8.2.1

Approach: Monitoring. Performance standards currently proposed by the applicant will not define a successful restoration project.

Proposed Wording of Condition: Maintenance monitoring shall include visual inspection of all planting areas with brief e-mail reports to the applicant and all involved agencies. Monitoring shall be scheduled once per month during the first growing season after seed application, switching to once per quarter starting in July after seed application. Monitoring may be reduced to once per year in late March through mid May of each year after the second growing season.

Performance monitoring methods

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Performance standards currently proposed by the applicant will not define a successful restoration project.

Reference in Data_Response_Set_2K: 7.8.2

Approach: Methods and schedule for performance monitoring

Proposed Wording of Condition: Performance monitoring shall be conducted annually during the spring flowering season, between mid March and mid May to assess restoration performance. Performance monitoring surveys of all vegetation on the subject sites shall be carried out in a manner able to detect project success. The entire proposed project area shall be divided into vegetation types as described by Sawyer and Keeler-Wolf. The boundaries of each vegetation type shall be compared with the baseline survey maps, and if the boundaries have changed the maps shall be updated and provided to BLM as a series of shape files. Each vegetation type will have soil, terrain, exposure, elevation, and slope clearly indicated. For each vegetation type provide a list of perennials and appropriate annuals. Surveys shall be performed at a season when the year's annuals are identifiable; generally from early March through late April. Survey methodology should emphasize accuracy rather than precision. Generally it is preferred to record a large number of rapid determinations rather than a small number of detailed determinations. BLM will accept rapid methods such as the step-point method (Bonham 1988) provided transects are laid out in a manner that captures the true composition of the vegetation. The combined length of step-point transects in each vegetation type shall approximate the square root of the area of the vegetation type or at least 400 intercepts and shall be laid out to give unbiased representation of all portions of the vegetation type. Vegetation need not be divided into herb and shrub layers as long as all species intercepted by points are included in the survey. Additional species not encountered on the transects shall be recorded separately on a diversity list.

TRANSPLANTS

Records of succulent transplantation

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Lack of specificity on size and age of succulents to be transplanted.

Reference in Data_Response_Set_2K: 4.5

Approach: Present a table that shows by species the number of plants onsite, the lower threshold height for salvage, the number in each size class, and the fate of plants not salvaged.
Proposed Wording of Condition: Each area to be cleared or mowed under this application shall be surveyed in detail, and every succulent shall be inventoried and mapped. Applicant shall provide prior to breaking ground a table showing for each plant the species, height, UTM coordinates to an accuracy of one meter or less, and expected disposition of the specimen. Height above ground level shall be provided in the table. Separate height criteria will be agreed with BLM for each species of succulent. In no case shall the height criterion exclude all or most of a species, as would happen with a uniform criterion of one foot.

Succulent transplantation research

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Research responsibilities not adequately addressed

Reference in Data_Response_Set_2K: 1.3.4

Approach: Ivanpah 1 subject to experimental evaluation for methods to be used on Ivanpah 2 and 3.

Proposed Wording of Condition: Succulent transplants done during preparation of the Ivanpah 1 site shall be fully documented and shall serve as trials of methods to be used during plant salvage on the Ivanpah 2 and 3 areas. Full records shall be available immediately upon request of BLM or their designated representatives and shall contain for each transplanted specimen the species, height, number of branches or pads as appropriate, donor location by UTM coordinates, methods used to remove, transport and store the plant, period of temporary storage, location, facility description and planting medium used for storage, and frequency of watering during storage. The records shall include plant condition at the time of collection, at the time of planting at the storage area, and quarterly during storage until such time as each plant is sold, placed in the field, or dies. No salvaged individuals of desert pincushion or Parish's club-cholla shall be sold to

the public. These individuals shall be carefully collected and handled in accordance with the Special-Status Plant Remedial Action Plan.

CLEARING

Clearing of vegetation Proposed Conditions of Approval for ISEGS

Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Contradictory wording about extent of clearing.

Reference in Data_Response_Set_2K: 1.3.1, 1.3.2

Approach: No general clearing of vegetation will be carried out as stated in 1.3.2. Instead, 1.3.1 will apply.

Proposed Wording of Condition: Clearing of vegetation shall be limited to areas for which final maps are provided to BLM before approval of the ROW. Clearing of vegetation will be permitted on roads, utility routes, building and parking areas, and temporary staging areas provided these are specifically documented on a georeferenced aerial photo or shape file, showing the exact locations of soil disturbance. BLM will consider relocating specific installations prior to the beginning of construction but will not approve additional acreage under the current application.

Locations for mowing of vegetation

Proposed Conditions of Approval for ISEGS

Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Contradictory wording about extent of clearing.

Reference in Data_Response_Set_2K: 1.3.2 and 2.2.1

Approach: Mowing limited to pre-defined and agreed areas.

Proposed Wording of Condition: Vegetation within the operations area may be mowed within agreed and pre-defined limits as required for access and operation. The pre-defined limits for mowing shall be specifically documented on a georeferenced aerial photo or shape file, showing the exact locations of proposed mowing. BLM will consider relocating the boundaries of the mowed areas prior to the beginning of construction but will not approve additional acreage under the current application.

Methods for mowing vegetation

Proposed Conditions of Approval for ISEGS

Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Contradictory wording about extent of clearing.

Reference in Data_Response_Set_2K: 1.3.2

Approach: Methods and height of mowing.

Proposed Wording of Condition: Mowing may be carried out only by hand-operated string trimmers or tractor-mounted flail or rotary mowers. Tractors operated within native vegetation shall be provided with low ground pressure tires. The height of the mowing blade shall be at least 15 inches.

PLANTING

Seed collection

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Seed collection procedures

Reference in Data_Response_Set_2K: 7.3.1.4

Approach: Range of species, collect from all to be destroyed.

Proposed Wording of Condition: Seed collection shall be carried out within an area mapped and provided to BLM with the project application. Special-status plant seed shall be separated from other native plant seed and handled according to the Special-Status Plant Remedial Action Plan.Future changes in seed collection area shall be negotiated separately with BLM. Collection areas shall be within 10 miles of the boundaries of the project site and shall be on similar terrain, soil, exposure, slope and elevation to the project site. Seed collection guidelines shall conform to all laws and regulations in effect at the time of collection and shall follow the guidelines for native seed collection provided by California Native Plant Society. Seed collection shall include all plant species known to be removed by construction and operation of the facility. If insufficient seeds are provided by "seed farming" and collection within 10 miles of the site, BLM may approve collection from a greater distance provided other environmental factors at the collection site are good matches to the project site.

Seed testing

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Restoration Methods

Reference in Data_Response_Set_2K: 7.3.1.4, Table 7-1, 7.3.3.2

Approach: Seed testing

Proposed Wording of Condition: Batches of seeds collected or produced for this project shall be tested by a certified seed testing laboratory that will provide for each batch of seeds determinations of purity, germination, and seed count. Seed not sorted by plant species, including collections from under shrubs, from depressions in the soil, and from harvester ant caches, may be used to supplement defined seed batches but shall not be included in the claim of known seed applications.

Seed application

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Restoration Methods

Reference in Data_Response_Set_2K: 7.4.1

Approach: Seed application by methods that provide good soil contact and protection from granivores. Information about the imprinting process and model specifications for imprinting contracts are available in St. John and Dixon (1996).

Proposed Wording of Condition: Seed shall be applied by methods that provide good seed-soil contact. The most successful methods in similar conditions are land imprinting or broadcasting followed by a roller that will press seeds into the soil but not cause heavy compaction. Contrary to opinions expressed in the current application document, imprinting has often worked well on sandy loams and even pure sand. A communication to this effect is provided in an appendix from Dr. Robert Dixon, inventor of the land imprinter. Any imprinter must meet be able to form continuous imprints with two-inch berms between micro-watersheds of one square foot. Machines making imprints on only a small fraction of the soil surface shall not be substituted for Dixon imprinter. Pitting may be acceptable by agreement with BLM, with seed drilling a potential but not preferred choice.

SOIL PREPARATION

Soil description

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Vague language

Reference in Data_Response_Set_2K: 7.2.5.1

Approach: Exact contents of soil baseline characterization

Proposed Wording of Condition: A soil baseline characterization shall be conducted before ground is broken at the proposed site. The characterization shall include:

a. Profile description of three representative pedons. (A pedon is the smallest three dimensional sampling unit displaying the full range of characteristics of a particular

soil and typically occupies an area ranging from about 1 to 10 square yards [Brady and Weil, 2002]).

b. Characterization of surface condition (that is, is desert pavement or cryptogamic crust present). Description of cryptogamic crust shall include major groups of organisms identified at the site (filamentous cyanobacteria, other cyanobacteria, mosses, lichens, liverworts) and the characteristics by which they were identified. No identification shall be required apart from the general list presented in this paragraph.
c. Documentation of soil macro-invertebrates (that is, presence of ants, termites, and other significant macro-invertebrates)
d. Soil texture (that is, percent sand, silt, and clay), along with a reference to a widely accepted method for making the determination.
e. Bulk density, along with a reference to a generally accepted method for making the determination.
f. Fertility (that is, nutrient status, electrical conductivity, sodium adsorption ratio), along with methods by which composite samples were collected and the laboratory methods used to determine these properties. Composite samples shall contain equal contributions from at least six randomly-located collection points within the soil donor area.
g. Organic matter content and total carbon and nitrogen content, along with a reference to generally accepted methods for making the determinations.

Soil compaction shall be determined by measurement of bulk density in grams per cubic centimeter (or numerically equivalent units). Bulk density may be determined by any of several standard measurements, but the method used must be referenced to a widely-accepted soil methodology publication. In no case shall soil be compacted to bulk density that exceeds 1.6 g/cc except where no planting is to take place. Penetrometer measurements are not a substitute for bulk density measurements.

Mulch application

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Mulch application has potential disadvantages as well as advantages.

Reference in Data_Response_Set_2K: 7.4.2

Approach: Mulch application is rarely done in this kind of restoration effort, but it could be beneficial.

Proposed Wording of Condition: Mulch application is done at the option of the operator. Mulch application to the soil shall consist of local non-weedy materials, the collection of which is incidental to other activities onsite. In no case shall mowing or grading of native vegetation be carried out for the sole purpose of generating mulch. Mulch shall be applied only to the soil surface unless the soil has already been inverted or severely disturbed through other procedures. Materials of relatively high nitrogen content, including alfalfa hay, shall not be applied.

SOIL STORAGE

Topsoil collection and storage

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Restoration Methods

Reference in Data_Response_Set_2K: 7.2.3

Approach: Require certain stockpiling procedures

Proposed Wording of Condition: Topsoil for this project shall be defined as the soil volume from the original surface to 8 inches in depth. The upper 1/4 inch may be collected separately to preserve biological crust organisms as prescribed elsewhere in these Conditions of Approval. Topsoil may not be distinguishable by color or organic content but will have most fine roots during the active growing season. Topsoil shall be stored at locations agreed to by BLM and designated for this purpose. All stockpiles shall be on ground previously disturbed for another purpose, such as roads no longer in use. If no disturbed location is available for topsoil storage, applicant will propose locations for BLM approval, then add the material on top of native vegetation at the agreed locations. Soil shall be collected, transported, and formed into stockpiles only while the soil is dry. The vegetation in place at or immediately before topsoil collection will be healthy native vegetation with less than 15 percent absolute cover of exotic weed growth. Soil occupied by vegetation of high plant diversity shall be given priority over soil occupied by low diversity native vegetation. Soil may be collected with a front loader, bulldozer, or scraper and transported to storage areas by front loader, dump truck, or scraper. The equipment transporting the soil shall not travel across the stockpile more than the minimum number of times required to build the soil to its intended depth. If transported in scrapers, the equipment shall travel new paths at each crossing to minimize the compaction of previous layers. The depth of the stockpiles shall not exceed 4 feet in the case of sandy loam or loamy sand soils. Topsoil stockpiles shall be kept dry and covered if no vegetation is introduced, but covers shall not be allowed to promote greenhouse heating of the stockpiles. If native vegetation is grown on the stockpiles to increase seeds and soil organisms, no cover shall be required. Artificial watering may be provided at the operator's option. Stored topsoil may be reapplied as a layer over decompacted subgrade material as a means of implementing the restoration program. The topsoil layer shall be a minimum of 3 inches in depth. In general, topsoil may be applied to about twice the land area from which it was removed. The topsoil layer shall be bonded to the subgrade with a lightly-loaded sheepsfoot roller, a land imprinter, or other implement that interlocks material from the two layers without causing bulk density in excess of 1.6 grams per cubic centimeter. Seeds may be distributed concurrently with layer bonding if a land imprinter is employed for both purposes.

Seed farming

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Unproductive uses of topsoil stockpiles under current proposal.

Reference in Data_Response_Set_2K: 7.2.3, 7.3.1.4

Approach: Seed farming

Proposed Wording of Condition: Topsoil to be stockpiled under other provisions of these conditions shall be used to grow native plant species for the purpose of producing native seeds and building beneficial microorganisms in the soil volume. All native plant species encountered in the vegetation surveys shall be in the growing rotation on the stockpiles. Most growing space shall be dedicated to the species for which the most seeds will be required. At least half by area of the growing area during each growing cycle shall be dedicated to plant species known to be good mycorrhizal host plants. These are often fast-growing, short-lived perennial grasses and composites, although representatives of many other plant families may be mycorrhizal hosts as well. Members of the families Chenopodiaceae and Amaranthaceae shall be limited to less than half the area of the soil stockpiles, with the other half occupied by known mycorrhizal host plant species.

SOIL BIOLOGY

Mycorrhizal inoculation

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Document contains no specificity about mycorrhizal inoculation.

Reference in Data_Response_Set_2K: 6.2.3

Approach: Give plant species, locations, inoculation methods, sources of inoculum, and methods of application.

Proposed Wording of Condition: Mycorrhizal inoculation shall be carried out in all planting areas having fewer than one spore per cubic centimeter of topsoil, where topsoil is defined as soil between the surface and 8 inches depth, or to bedrock if the soil is less than 8 inches in depth. Spore counts shall be carried out by methods given in Johnson et al. or other accepted methodology as approved by the BLM project manager or his designated representative. Inoculation shall result in a minimum of one spore per cubic centimeter of soil as defined for initial spore counts. No inoculation shall be required in areas where the operator is able to demonstrate that all plant species on the list of final

desired vegetation are known to be non-host species. This condition might be found in saline or very alkaline soils.

Biological crust collection and storage

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: The lack of attention to soil biological crust in a setting where it should be present and should be restored.

Reference in Data_Response_Set_2K: 7.2

Approach: Point out the role of soil biological crust in protecting the soil and holding weeds at bay, and require that key components of the soil crust be restored.

Proposed Wording of Condition: Soil biological crust is defined here as a mixture of organisms that occupy and protect the surface of the soil in most desert ecosystems. The organisms often include filamentous and non-filamentous cyanobacteria, mosses, lichens, liverworts and fungi. Soil biological crust shall be preserved by collecting the upper 1/4 inch of topsoil from areas to be graded. Applicant may flag specific areas known to contain biological crust organisms or collect upper soil from the entire area. BLM or its designated representative must concur that the correct areas have been flagged if collections are to include less than the entire area over which the soil surface will be disturbed. Collections are to emphasize filamentous cyanobacteria; but other cyanobacteria, mosses, lichens, and liverworts are also considered valuable contributors to the soil biological crust and will be important in protecting against erosion and reducing weed invasion. Soil surface crust shall be air dried and stored dry in a shaded location in containers that allow air movement, such as loose-weave fabric bags. In no case shall the stored crust be subject to wetting or direct sunlight during storage. All containers shall be clearly labeled with date and location of original collection; name and contact information of persons responsible for identifying suitable material to collect; and the persons who collected, stored, and maintained collections.

Soil biological crust shall be re-applied at the time of replanting by crumbling the stored material and broadcasting it on the surface of the soil. Stored crust material may be applied to an area up to 10 times the area from which it was collected. Approximately 10 percent of the stored material shall be broadcast on topsoil storage areas among plants being grown for seed and soil microorganisms. When the growing cycle progresses to new planting, the soil supporting biological crust shall be collected and stored by the same methods prescribed for collections from the original soil, in clearly labeled bags or other suitable containers.

WEED MANAGEMENT

Mirror wash water

Proposed Conditions of Approval for ISEGS
Ted St. John, Ph.D. Chambers Group, Inc.

Deficiency Addressed by this Condition: Moisture from washing mirrors is not adequately addressed

Reference in Data_Response_Set_2K: 5.3

Approach: Wash water may very well cause weed growth and root diseases of nearby native plants.

Proposed Wording of Condition: Even though mirror washing will be infrequent, evaporation will not be certain to remove moisture from soil. Washing will be done at night and throughout the calendar year and is likely to collect in the upper soil at least locally. Stored moisture can support vigorous weed growth and will present a risk for root disease in nearby native plants that are adapted for soil that is usually dry. All weed growth brought on by mirror washing shall be controlled by trimming the weeds to less than six inches in height. Any native succulents or plant species of concern within the drainage area of mirror washing will be monitored quarterly. If wilting or other signs of stress occur, the plants will be moved to an unshaded portion of the operations area. Any such moves of plants not already approved under other Conditions of Approval shall be specifically verified in writing by BLM or its designated representative.

REFERENCES

Bonham, CD. 1989. Measurement for Terrestrial Vegetation. New York, NY: John Wiley and Sons. Inc. 338p.

CH2MHill 2009 Attachment DR125-3B Closure, Revegetation, and Rehabilitation Plan for the Ivanpah Solar Electric Generating System, Eastern Mojave Desert, San Bernardino County, California. Prepared for Ivanpah Solar Electric Generating System, June 2009

Sawyer, John O. and Keeler-Wolf, Todd 1995. A Manual of California Vegetation. California Native Plant Society Press, Berkeley, California.

St. John, Ted, Ph.D. and Bob Dixon, Ph.D. 1997. Land Imprinting: An overview and proposed technical specifications. Tree of Life Nursery, San Juan Capistrano, CA.

APPENDICES

Letter from Bob Dixon

Dr. Robert M. Dixon is a retired soil scientist with the USDA Agricultural Research Service in Tucson, Arizona. He spent many years studying water infiltration in desert soils and devised the land imprinter as a solution to the problem of physical crusts that develop on bare soils and inhibit infiltration. Received August 12, 2009, in response to my inquiry:

Ted,

Imprinting works well in sandy soils and is definitely superior to seed drills because imprinting provides better seed-to-soil contact and better capillary flow of moisture to the seed because of greater soil firming by imprinters. Early on, imprinting was shown to be greatly superior for establishing stands of alfalfa in sandy Minnesota soils for the 2 reasons given above. Land imprinting works well in the sandy soil of desert dry washes.

Best Regards,

Bob Dixon

Photos of successful desert restoration sites

Separate PDF

St. John and Dixon

Booklet in Separate PDF

Appendix B-2
Hazardous Materials Appendices

Hazardous Materials Appendix A

Hazardous Materials Proposed for Use At the ISEGS Power Project
September 2009

Trade Name	Chemical Name	CAS Number	Application	Maximum Quantity Onsite
Antiscalant (Permatreat PC-391)	Not Available	None	Antiscalant for boiler and steam turbine	70 gal
Cleaning chemicals/detergents	Various	None	Periodic cleaning of steam turbine	100 gal
Diesel No. 2	Oil	None	Fuel for fire pump engine/generators	9,000 gal
Hydraulic oil	Oil	None	High-pressure turbine starting system, turbine control valve actuators	500 gal
Lubrication oil	Oil	None	Lubricate rotating equipment (e.g., steam turbine bearings)	30,000 gal
Mineral insulating oil	Oil	801295-1	Transformers/switchyard	105,000 gal
Oxygen scavenger (Cortrol OS5607)	Carbonic Dyhdrazide	497-187	Oxygen scavenger for boiler cleaning solution and steam-water cycle	170 gal
Phosphate Treatment (Optisperse HP3100)	Sodium Hydroxide	131073-2	Phosphate treatment for boiler internal treatment	62 gal
Sodium Hydroxide Solution	Sodium hydroxide (30%)	131073-2	pH Control	170 gal
Steam Condensate Treatment (Steamate NA1321)	Ammonium Hydroxide	133621-6	Condensate and feedwater pH control	300 gal
Sulfuric Acid	Sulfuric acid (20%)	766493-9	pH control	670 gal
Lead Acid Batteries (Sulfuric Acid and Lead) size of batteries approx 10cm x 5cm x 7cm	Sulfuric acid (10%-30%) Lead (4560%)	766493-9 743992-1	Electrical power	272,000 batteries
Sulfur hexafluoride	Sulfur hexafluoride	255162-4	Switchyard/switchgear devices	200 lb

a. Source: CH2M Hill 2007, Tables 5.5-3, 5.5-4

Appendix B-3
Noise Appendices

Noise Appendix A
Fundamental Concepts Of Community Noise

To describe noise environments and to assess impacts on noise-sensitive area, a frequency weighting measure, which simulates human perception, is customarily used. It has been found that "A-weighting" of sound intensities best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. Decibels are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. **NOISE Table A1** provides a description of technical terms related to noise.

Noise environments and consequences of human activities are usually well represented by an equivalent A-weighted sound level over a given time period (Leq), or by average day and night A-weighted sound levels with a nighttime weighting of 10 dBA (Ldn). Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. Outdoor day-night sound levels vary over 50 dBA depending on the specific type of land use. Typical Ldn values might be 35 dBA for a wilderness area, 50 dBA for a small town or wooded residential area, 65 to 75 dBA for a major metropolis downtown (e.g., San Francisco), and 80 to 85 dBA near a freeway or airport. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, those higher levels nevertheless are considered to be levels of noise adverse to public health.

Various environments can be characterized by noise levels that are generally considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding average daytime levels. The day-to-night difference in rural areas away from roads and other human activity can be considerably less. Areas with full-time human occupation that are subject to nighttime noise, which does not decrease relative to daytime levels, are often considered objectionable. Noise levels above 45 dBA at night can result in the onset of sleep interference effects. At 70 dBA, sleep interference effects become considerable (U. S. Environmental Protection Agency, Effects of Noise on People, December 31, 1971).

To help the reader understand the concept of noise in decibels (dBA), **NOISE Table A2** illustrates common noises and their associated sound levels, in dBA.

NOISE Table A1
Definition of Some Technical Terms Related to Noise

Terms	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.

Terms	Definitions
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this testimony are A-weighted.
L_{10}, L_{50}, & L_{90}	The A-weighted noise levels that are exceeded 10%, 50%, and 90% of the time, respectively, during the measurement period. L_{90} is generally taken as the background noise level.
Equivalent Noise Level, L_{eq}	The energy average A-weighted noise level during the noise level measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 4.8 decibels to levels in the evening from 7:00 p.m. to 10:00 p.m., and after addition of 10 decibels to sound levels in the night between 10:00 p.m. and 7:00 a.m.
Day-Night Level, L_{dn} or DNL	The Average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 p.m. and 7:00 a.m.
Ambient Noise Level	The composite of noise from all sources, near and far. The normal or existing level of environmental noise at a given location.
Intrusive Noise	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.
Pure Tone	A pure tone is defined by the Model Community Noise Control Ordinance as existing if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the two contiguous bands by 5 decibels (dB) for center frequencies of 500 Hz and above, or by 8 dB for center frequencies between 160 Hz and 400 Hz, or by 15 dB for center frequencies less than or equal to 125 Hz.

NOISE Table A2
Typical Environmental and Industry Sound Levels

Noise Source (at distance)	A-Weighted Sound Level in Decibels (dBA)	Noise Environment	Subjective Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		Very Loud
Very Loud Music	110	Rock Music Concert	
Pile Driver (50')	100		
Ambulance Siren (100')	90	Boiler Room	
Freight Cars (50')	85		
Pneumatic Drill (50')	80	Printing Press Kitchen with Garbage Disposal Running	Loud
Freeway (100')	70		Moderately Loud
Vacuum Cleaner (100')	60	Data Processing Center Department Store/Office	
Light Traffic (100')	50	Private Business Office	
Large Transformer (200')	40		Quiet

Noise Source (at distance)	A-Weighted Sound Level in Decibels (dBA)	Noise Environment	Subjective Impression
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing

Source: Guidelines for the Preparation and Content of Noise Elements of the General Plan, Model Community Noise Control Ordinance, California Department of Health Services 1976, 1977. Source: Handbook of Noise Measurement, Arnold P.G. Peterson, 1980

Subjective Response to Noise

The adverse effects of noise on people can be classified into three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction.
- Interference with activities such as speech, sleep, and learning.
- Physiological effects such as anxiety or hearing loss.

The sound levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants can experience noise effects in the last category. There is no completely satisfactory way to measure the subjective effects of noise or of the corresponding reactions of annoyance and dissatisfaction, primarily because of the wide variation in individual tolerance of noise.

One way to determine a person's subjective reaction to a new noise is to compare the level of the existing (background) noise, to which one has become accustomed, with the level of the new noise. In general, the more the level or the tonal variations of a new noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

With regard to increases in A-weighted noise levels, knowledge of the following relationships can be helpful in understanding the significance of human exposure to noise.

1. Except under special conditions, a change in sound level of 1 dB cannot be perceived.
2. Outside of the laboratory, a 3-dB change is considered a barely noticeable difference.
3. A change in level of at least 5 dB is required before any noticeable change in community response would be expected.
4. A 10-dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response (Kryter, Karl D., The Effects of Noise on Man, 1970).

Combination of Sound Levels

People perceive both the level and frequency of sound in a non-linear way. A doubling of sound energy (for instance, from two identical automobiles passing simultaneously)

creates a 3-dB increase (i.e., the resultant sound level is the sound level from a single passing automobile plus 3 dB). **NOISE Table A3** indicates the rules for decibel addition used in community noise prediction.

NOISE Table A3
Addition of Decibel Values

When two decibel values differ by:	Add the following amount to the larger value
0 to 1 dB 2 to 3 dB 4 to 9 dB 10 dB or more	3 dB 2 dB 1 dB 0
Figures in this table are accurate to ± 1 dB.	

Source: Architectural Acoustics, M. David Egan, 1988.

Sound and Distance

Doubling the distance from a noise source reduces the sound pressure level by 6 dB. Increasing the distance from a noise source 10 times reduces the sound pressure level by 20 dB.

Worker Protection

OSHA noise 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 the worker is exposed, as shown in **NOISE Table A4**.

NOISE Table A4
OSHA Worker Noise Exposure Standards

Duration of Noise (Hrs/day)	A-Weighted Noise Level (dBA)
8.0 6.0 4.0 3.0 2.0 1.5 1.0 0.5 0.25	90 92 95 97 100 102 105 110 115

Source: 29 CFR §1910.95.

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Appendix B-4
Soil and Water Appendices

Soil And Water Resources Appendix A
Facts For Wastewater Discharge

1. Reason for Action and Regulatory Authority

   The applicant filed an Application for Certification (AFC) with the California Energy Commission (Energy Commission) on August 31, 2007. The AFC proposed the construction and operation of the Ivanpah Solar Electric Generating System (ISEGS) project in the Ivanpah Valley in San Bernardino County, California. In conjunction with ISEGS project construction, the applicant proposes to discharge wastes, dredged, and/or fill material to State waters. Additionally, construction and operation of the ISEGS project would have the potential to impact water quality via storm water runoff.

   Under the Warren-Alquist Act, and Governor's Executive Order S-14-08, the Energy Commission has the authority to streamline permitting for renewable energy generation facilities. The Lahontan Regional Water Quality Control Board (Lahontan RWQCB) requirements for this project would be issued to the applicant through the Energy Commission's certification process.

   In a May 28, 2009 letter, the U.S. Army Corps of Engineers determined that the drainages on the site are not waters of the United States (U.S.). However, the drainages affected by the Project are waters of the State, as defined by California Water Code (Water Code) section 13050, and are subject to State requirements in accordance with Water Code section 13260 and to the Water Quality Control Plan for the Lahontan Region (Basin Plan). All actions impacting or potentially impacting these drainages, including dredge and fill activities and construction and industrial activities, would be regulated through these requirements, which would be incorporated in the Energy Commission's certification process.

2. Waste Discharge Requirements History

   The ISEGS project would be a new facility. There are no previous Lahontan RWQCB actions for the ISEGS project or location. The *Facts, Requirements,* and *Surface Water Monitoring and Reporting Program* for waste discharge address storm water, dredge and fill, and groundwater requirements for the proposed ISEGS project are presented herein.

3. Climate

   The Mojave Desert has a typical desert climate, i.e., extreme daily temperature changes, low annual precipitation, strong seasonal winds, and mostly clear skies. The annual highest temperature in the Mojave Desert exceeds 100 degrees Fahrenheit. Winter temperatures are more moderate, with mean maximum temperatures in the 60s and lows in the 30s. For the period of 1971 to 2000, the average annual precipitation in the vicinity of the ISEGS project ranged from 5 to 7 inches. Most of the precipitation occurs between December and March. However, occasional heavy precipitation occurs in the summer due to thunderstorms.

4. Site Geology
   a. Setting

      The ISEGS project would be located in the Basin and Range Geomorphic Province, which is characterized by an extensional tectonic regime, i.e., block-faulted mountain ranges separated by down-dropped, sediment filled basins. The proposed project site is on the western flank of the Ivanpah Valley in the eastern Mojave Desert. Ivanpah Valley is an elongate, internally draining, structural basin, which extends north into Las Vegas Valley. The ISEGS project would be situated on the mid portion of a bajada (a broad apron of coalesced alluvial fans) on the east side of the Clark Mountains.

   b. Faulting and Seismicity

      The active northwest-trending State Line, Ivanpah, and Clark Mountain faults transect the Ivanpah Valley.

   c. Soils

      The proposed ISEGS project surface is covered by coarse-grained, gravelly soils that are characterized by the Natural Resource Conservation Service as well drained to excessively well drained with negligible to medium runoff potential.

5. Groundwater

   The Ivanpah Valley is underlain by the Ivanpah Valley Groundwater Basin (Department of Water Resources Basin No. 6-30). The north-south trending basin extends into Nevada and includes Jean Lake Valley at its northern extent. It is bounded by bedrock mountains, which have shed the detritus that forms the unconsolidated alluvial deposits of the basin. These deposits appear to extend to depths of 8,000 feet or more near the axis of the basin.

   Groundwater in the basin appears to be largely unconfined. In the vicinity of the ISEGS project, the depth to groundwater ranges from approximately 200 to 700 feet below ground surface. The shallower depth to groundwater occurs in the topographically lowest portion of the proposed ISEGS project, near Ivanpah Lake. In the western portion of the proposed ISEGS project area, which is topographically higher on the bajada, the depth to groundwater is the greatest. The groundwater flow direction is generally east toward Ivanpah Lake.

   Groundwater quality in the groundwater basin is generally good, although total dissolved solids (TDS) can be high in some areas. TDS at the ISEGS project site is estimated to be between 300 to 600 milligrams per liter (mg/L). TDS levels increase in the proximity of Ivanpah Lake.

The applicant plans to install two groundwater wells and to use the wells to supply water during construction and operation. The ISEGS project would use a dry-cooling technology to avoid the use of water for power plant cooling.

6. Surface Water and Storm Water

   Ivanpah Valley is an arid, internally draining basin. In the southern portion of the valley, surface water flow is toward Ivanpah Lake, a predominately dry lakebed.

Numerous ephemeral channels (i.e., washes) drain from the Clark Mountains, across the bajada surface where the ISEGS project would be located, and terminate at Ivanpah Lake. The ephemeral washes are characterized by natural processes that, to varying degrees, support native desert wash vegetation and provide wildlife habitat.

Surface water drainage at the proposed ISEGS project area is a complex network of interconnected or anastomosing channels. The channels represent ephemeral washes that only flow when storm events generate runoff from the Clark Mountains. During such events, the proposed ISEGS project site can be subject to flash flooding and mass erosion. A hydrologic study and modeling performed by the applicant and the U. S. Bureau of Land Management (BLM) found that the 100-year flood event would inundate most of the proposed ISEGS project area through canalized and sheet flows, and would be primarily erosive in nature.

7. Land Uses and Existing Site Conditions

   The proposed ISEGS project site and adjacent areas are federal lands managed by the BLM's California Desert District and are used for low intensity livestock grazing. The Primm Valley Golf Club is approximately 0.5 miles east of the proposed ISEGS project area.

   The 4,073-acre ISEGS project consists of a relatively undisturbed Mojave creosote bush scrub environment, which supports a diversity of plant communities and a high diversity of wildlife, including the Federal and State Endangered desert tortoise.

8. Description of Dredge and Fill Impacts to State Waters

   The ISEGS project involves the proposed discharge of structural materials and/or earthen wastes (fill) as described in Table 1.

9. Mitigation Plan

   See Mitigation Measure **BIO-20** for a description of the compensation requirements for impacts to waters of the State.

10. Storm Water Discharges

    The existing slope and drainage of the proposed ISEGS project site have not been previously modified from their natural state. Topographically, the proposed site is relatively uniform and slopes down to the east at a gradient of approximately 5 percent. Grading would be minimized to the extent feasible (i.e., restricted to the three power blocks, support area, and areas with higher topographic relief in the northern portion of the proposed site). Outside of those specified areas, existing conditions would be largely maintained during construction and operation.

    The *Requirements* contained in Attachment 3 regulate construction-related and industrial-related waste discharges in storm water runoff and other discharges that would be associated with ISEGS project. The requirements also direct the applicant to maintain pre-development infiltration, surface retention, and recharge rates in order to minimize post-development impacts to offsite water bodies and underlying groundwater. The applicant would be required to avoid adverse effects of altering

the hydrologic characteristics (i.e., avoid hydromodification) of the ISEGS project area by site design and construction practices.

a. *Construction Storm Water Management* The ISEGS project would be divided into three power-generating phases, referred to as Ivanpah 1, 2, and 3. The project phases would be built sequentially and the applicant estimates that construction would be ongoing for a total of 24 months for each phase. Under the Storm Water Pollution Prevention Plan (SWPPP) and Drainage, Erosion, and Sediment Control Plan (DESCP), site grading would be minimized and most storm water would be allowed to flow unimpeded across the site in existing channels and as sheet flow. The applicant would implement Best Management Practices (BMPs) as described in the SWPPP and DESCP to prevent water quality impacts during construction.

b. *Post-Construction Storm Water Management* Impacts to the onsite ephemeral washes would be minimized through the implementation of a low impact development approach (i.e., measures that maintain or mimic pre-development hydrology) as described in the DESCP. Storm water diversion structures would only be constructed around the substation and the three power blocks. The applicant proposes to manage storm water, erosion, and sedimentation at the completed ISEGS project through a comprehensive system of source controls, treatment BMPs, and site design. The final storm water management system must replicate pre-development hydrographs for the 2-year through the 10-year, 24-hour storm events. At a minimum, the applicant would adhere to detention and retention requirements of State Water Resources Control Board's *Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activity, General Permit No CAS00002*; *Waste Discharge Requirements For Discharges of Storm Water Associated With Industrial Activities, General Permit No. CAS00001*; and all subsequent revisions and amendments to these general permits.

11. Wastewater Discharges Wastewater generated by ISEGS project operation would be from three sources: wastewater generated after the piping and vessel hydrostatic testing, wastewater generated from washing the heliostats and, domestic waste discharged to onsite septic systems. The hydrostatic test water would either be trucked to a licensed treatment facility or disposed to land under a low threat to groundwater waiver in accordance with SWRCB Water Quality Order 2003-003-DWQ. The excess heliostat wash water would drain to the ground surface beneath the heliostats where it would evaporate. The septic systems would be sited and designed in accordance to the Basin Plan and San Bernardino County requirements.

12. Receiving Waters The receiving waters are the "minor surface waters of the Ivanpah Hydrologic Area" (Hydrologic Subunit 612.00) and groundwaters of the Ivanpah Groundwater Basin (Department of Water Resources No. 6-30).

13. Basin Plan

The Lahontan RWQCB adopted the Basin Plan, which became effective on March 31, 1995. The *Requirements* and *Surface Water Monitoring and Reporting Program*, Attachments 2 and 3, respectively, implement the Basin Plan.

14. Beneficial Uses - Surface Waters

The Basin Plan designates beneficial uses for surface waters in each watershed of the Lahontan Region. The beneficial uses listed for minor surface waters of the Ivanpah Hydrologic Area include:

a. municipal and domestic water supply (MUN),
b. agricultural supply (AGR),
c. groundwater recharge (GWR),
d. water contact recreation (REC-1),
e. non-contact water recreation (REC-2),
f. commercial and sportsfishing (COMM),
g. warm freshwater habitat (WARM),
h. wildlife habitat (WILD).

15. Beneficial Uses - Groundwaters

The Basin Plan designates beneficial uses for groundwaters in each watershed of the Lahontan Region. Beneficial uses of groundwaters of the Ivanpah Groundwater Basin include:

a. municipal and domestic water supply (MUN),
b. agricultural supply (AGR),
c. industrial surface supply (IND),
d. freshwater replenishment (FRSH).

16. Non-Degradation

The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 (*Statement of Policy with Respect to Maintaining High Quality of Waters in California*). Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings or facts. The Basin Plan implements and incorporates by reference State antidegradation policies.

17. 17. Other Considerations and Requirements for Discharge

Pursuant to Water Code section 13241, the *Facts, Requirements*, and *Surface Water Monitoring and Reporting Program* take into consideration:

a. *Past, present, and probable future beneficial uses of water.* These requirements identify past, present, and probable future beneficial uses of water as described in Facts Nos. 14 and 15. The proposed discharge would not adversely affect present or probable future beneficial uses of the receiving waters.
b. *Environmental characteristics of the hydrologic unit and the groundwater basin under consideration, including the quality of water available thereto.* Facts Nos. 3

through 7 describe the environmental characteristics and quality of waters in the hydrologic unit and groundwater basin.

c. *Water quality conditions that could reasonably be achieved through the coordinated control of all factors that affect water quality in the area.*

These requirements would not result in changes to groundwater quality. Adverse effects to surface water quality would be minimized.

d. *Economic considerations.* The Energy Commission's certification authorizes the applicant to implement closure and post-closure maintenance actions at the ISEGS project as proposed by the applicant. These requirements accept the applicant's proposed actions as meeting the best practicable control method for protecting water quality from impacts from the ISEGS project.

e. *The need for developing housing in the region.* The applicant is not responsible for developing housing in the region.

f. *The need to develop and use recycled water.* The water requirements for the ISEGS project would be minimized by the incorporation of dry-cooling technology. Additionally, there are no feasible sources of recycled water in the vicinity of the proposed ISEGS project.

Soil and Water Resources Appendix B

Dredge and Fill Impacts to Waters of the State*

		Linear Impacts[4] (feet):	Impact Area (acres)	Fill Volume (cubic yards)	Dredge Volume (cubic yards)
30-foot-wide asphalt roads (including 3-foot shoulder)	Amount	11,639	---	---	---
	Temporary1		0.995	0	0
	Long-term2		0.5	806	806
	Permanent3		1.346	2,172	2,172
24-foot-wide asphalt roads	Amount	4,433	---	---	---
	Temporary		0.13	0	0
	Long-term		0.31	500	500
	Permanent		0.059	95	95
15-foot-wide dirt roads	Amount	2,022	---	---	---
	Temporary		0	0	0
	Long-term		0.192	0	0
	Permanent		0	0	0
12-foot-wide dirt roads	Amount	16,171	---	---	---
	Temporary		0.154	0	0
	Long-term		2.19	0	0
	Permanent		0.113	0	0
12-foot-wide rerouted trails	Amount	1,194	---	---	---
	Temporary		0	0	0
	Long-term		0.061	0	0
	Permanent		0.188	0	0
12-foot-wide gravel road	Amount	487	---	---	---
	Temporary		0	0	0
	Long-term		0	0	0
	Permanent		0.028	0	0
10-foot-wide heliostat maintenance paths	Amount	154,800	---	---	---
	Temporary		0	0	0
	Long-term		21.57	0	0
	Permanent		0	0	0
10-foot-wide heliostat arrays	Amount	158,285	---	---	---
	Temporary		21.8	0	0
	Long-term		0.031	0	0
	Permanent		0	0	0
Natural gas line corridor	Amount	7,380	---	---	---
	Temporary		0.939	0	0
	Long-term		0	0	0
	Permanent		0	0	0
Gas and water utility lines	Amount	1,126	---	---	---
	Temporary		0.215	2,828	2,828
	Long-term		0.19	0	0
	Permanent		0	0	0

		Linear Impacts[4] (feet):	Impact Area (acres)	Fill Volume (cubic yards)	Dredge Volume (cubic yards)
Metering sets	Amount	80	---	---	---
	Temporary		0	0	0
	Long-term		0.005	0	0
	Permanent		0	0	0
Power blocks, diversion channels and berms	Amount	17,177	---	---	---
	Temporary		0	0	0
	Long-term		1.284	1,419	503
	Permanent		0.15	75	289
Gen-tie lines and towers	Amount	0	---	---	---
	Temporary		0	0	0
	Long-term		0	0	0
	Permanent		0	0	0
Administration/Maintenance Building	Amount	3,618	---	---	---
	Temporary		0	0	0
	Long-term		0.444	666	0
	Permanent		0	0	0
Substation	Amount	4,670	---	---	---
	Temporary		0	0	0
	Long-term		0	0	0
	Permanent		0.572	845	0
Construction laydown, staging and stockpiling	Amount		---	---	---
	Temporary		2.674	0	0
	Long-term		0	0	0
	Permanent		0	0	0
Perimeter fence installation	Amount	0	---	---	---
	Temporary		76	0	0
	Long-term		0	0	0
	Permanent		0	0	0
Total Dredge and Fill Impacts	Amount	383,082			
	Temporary		26.91	2,828	2,828
	Long-term		26.78	3,391	1,809
	Permanent		2.46	3,187	2,556

NOTES: *Table 1 is based on Ivanpah Solar Electric Generating System's Data Response to Energy Commission, Set 1P, *Beneficial Use and Dredge/Fill Analyses for Waters of the State,* September 9, 2009 1 Temporary impacts are associated with construction activities, and these areas would be restored upon completion o construction. 2 Long-term impacts would continue for the duration of ISEGS project operations, which is estimated at approximately 50 years. At ISEGS project decommissioning, these areas would be rehabilitated and revegetated.3 Permanent impacts are associated with roads and structures that would remain following ISEGS project closure. 4 Note that linear distances are likely overestimated since there is redundancy among values for temporary, long-term, and permanent impacts.

Soil And Water Resources Appendix C
Requirements For Wastewater Discharge

I. Discharge Specifications

A. Storm Water Discharges

Waste in discharges of storm water must be reduced or prevented to achieve the best practicable treatment level using controls, structures, and management practices. The applicant shall comply with all requirements (with the exception of purely administrative requirements, e.g., filing a Notice of Intent) contained in State Water Resources Control Board's (SWRCB) *Waste Discharge Requirements For Discharges of Storm Water Runoff Associated With Construction Activity, General Permit No. CAS00002*; *Waste Discharge Requirements For Discharges of Storm Water Associated With Industrial Activities, General Permit No. CAS00001*; and all subsequent revisions and amendments.

These requirements do not preclude the applicant from requirements imposed by municipalities, counties, drainage districts, and other local agencies regarding discharges of storm water to separate storm sewer systems or other water, conveyances, and water bodies under their jurisdiction.

B. Receiving Water Limitations

Receiving water limitations are narrative and numerical water quality objectives contained in the Water Quality Control Plan for the Lahontan Region (Basin Plan). As such, the objectives are required to be met.

1. Surface Water Objectives

The discharge of waste to surface waters shall not cause or contribute to a violation of the following water quality objectives for waters of the Ivanpah Hydrologic Unit (No. 612.00).

a. Ammonia

Ammonia concentrations shall not exceed the values listed in Tables 3-1 through 3-4 of the Basin Plan for the corresponding conditions in these tables. Tables 3-1 through 3-4 of the Basin Plan are incorporated into these requirements by reference.

b. Bacteria, Coliform

i. Waters shall not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes.

ii. The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 milliliter (ml) nor shall more than 10 percent of all samples collected during any 30-day period exceed 40/100 ml. The log mean shall ideally be based on a minimum of not less than five samples collected as evenly spaced as practicable during any 30-day period. However, a log mean concentration

exceeding 20/100 ml, or one sample exceeding 40/100 ml, for any 30-day period shall indicate violation of this objective even if fewer than five samples were collected.

c. Biostimulatory Substances

Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect the water for beneficial uses.

d. *Chemical Constituents*

i. Waters designated as MUN (municipal and domestic supply) shall not contain concentrations of chemical constituents in excess of the primary or secondary maximum contaminant levels (MCL) based upon drinking water standards specified in provisions of the California Code of Regulations (CCR), Title 22, Division 4, Chapter 15, hereby incorporated by reference into these requirements. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

ii. Waters shall not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses.

e. *Chlorine, Total Residual*

For the protection of aquatic life, total chlorine residual shall not exceed either a median value of 0.002 milligrams/liter (mg/L) or a maximum value of 0.003 mg/L. Median values shall be based on daily measurements taken within any six-month period.

f. Color

Waters shall be free of coloration that causes nuisance or adversely affects the water for beneficial uses.

g. Dissolved Oxygen

i. The dissolved oxygen concentration as percent saturation shall not be depressed by more than 10 percent, nor shall the minimum dissolved oxygen concentration be less than 80 percent of saturation.

ii. For waters with the beneficial uses of COLD (cold freshwater habitat) or WARM (warm freshwater habitat), the minimum dissolved oxygen concentration shall not be less than that specified in Table 3-6 of the Basin Plan. Table 3-6 of the Basin Plan is incorporated herein by reference.

h. *Floating Materials*

i. Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect the water for beneficial uses.

ii. The concentrations of floating material shall not be altered to the extent that such alterations are discernible at the 10 percent significance level.

i. *Oil and Grease*

i. Waters shall not contain oils, greases, waxes or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect the water for beneficial uses.

ii. The concentration of oils, greases, or other film or coat generating substances shall not be altered.

j. *Pesticides*

i. For the purposes of these requirements, pesticides are defined to include insecticides, herbicides, rodenticides, fungicides, pesticides and all other economic poisons. An economic poison is any substance intended to prevent, repel, destroy, or mitigate the damage from insects, rodents, predatory animals, bacteria, fungi, or weeds capable of infesting or harming vegetation, humans, or animals (California Agriculture Code 12753).

ii. Pesticide concentrations, individually or collectively, shall not exceed the lowest detectable levels, using the most recent detection procedures available. There shall not be an increase in pesticide concentrations found in bottom sediments. There shall be no detectable increase in bioaccumulation of pesticides in aquatic life.

iii. Waters designated as MUN shall not contain concentrations of pesticides or herbicides in excess of the limiting concentrations set forth in the CCR, Title 22, Division 4, Chapter 15. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

k. *pH*

In fresh waters with designated beneficial use of COLD or WARM, changes in normal ambient pH levels shall not exceed 0.5 pH units.

l. *Radioactivity*

i. Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life nor which result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

ii. Waters designated as MUN shall not contain concentrations of radionuclides in excess of the limits specified by the more restrictive of the CCR Title 22 Division 4, Article 5 sections 64441 et seq. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

m. *Sediment*

The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect the water for beneficial uses.

n. Settleable Materials

Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or that adversely affects the water for beneficial uses. The concentration of settleable materials shall not be raised by more than 0.1 milliliters/liter.

o. *Suspended Materials*

i. Waters shall not contain suspended materials in concentrations that cause nuisance or that adversely affect the water for beneficial uses.

ii. The concentration of total suspended materials shall not be altered to the extent that such alterations are discernible at the 10 percent significance level.

p. *Taste and Odor*

Waters shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish or other edible products of aquatic origin, that cause nuisance, or that adversely affect the water for beneficial uses. The taste and odor shall not be altered.

q. Temperature

i. The natural receiving water temperature of all waters shall not be altered unless it can be demonstrated to the satisfaction of the BLM Authorized Officer that such an alteration in temperature does not adversely affect the water for beneficial uses.

ii. For waters designated COLD, the temperature shall not be altered. For waters designated WARM, water temperature shall not be altered by more than 5 degrees Fahrenheit above or below the natural temperature.

r. *Toxicity*

i. All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

ii. The survival of aquatic life in surface waters subjected to a waste discharge, or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge, or when necessary, for other control water that is consistent with the requirements for "experimental water" as defined in the most

recent edition of *Standard Methods for the Examination of Water and Wastewater* (American Public Health Association, et al.).

s. *Turbidity*

Waters shall be free of changes in turbidity that cause nuisance or adversely affect the water for beneficial uses. Increases in turbidity shall not exceed natural levels by more than 10 percent.

2. Groundwater Objectives

The discharge of waste to groundwaters shall not cause, or contribute to, a violation of the following water quality objectives for waters of the Ivanpah Groundwater Basin (Department of Water Resources No. 6-30).

a. Bacteria, Coliform

In groundwaters designated as MUN, the median concentration of coliform organisms over any seven-day period shall be less than 1.1/100 ml.

b. *Chemical Constituents*

i. Groundwaters designated as MUN shall not contain concentrations of chemical constituents in excess of the primary or secondary MCLs based upon drinking water standards specified in provisions of the CCR, Title 22, Division 4, Chapter 15, hereby incorporated by reference into these requirements. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

ii. Groundwaters shall not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses.

c. *Radioactivity*

Groundwaters designated as MUN shall not contain concentrations of radionuclides in excess of the limits specified by the more restrictive of the CCR Title 22 Division 4, Article 5 sections 64441 et seq. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

d. Taste and Odor

Waters shall not contain taste or odor-producing substances in concentrations that cause nuisance or that adversely affect beneficial uses. For groundwaters designated MUN, at a minimum, concentrations shall not exceed adopted secondary MCLs based upon drinking water standards specified in provisions of the CCR, Title 22, Division 4, Chapter 15, hereby incorporated by reference into these requirements. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

II. Prohibitions and Requirements

The discharge of wastes and fill associated with the ISEGS project must not violate the following waste discharge prohibitions. These waste discharge prohibitions do not apply to discharges of storm water when wastes in the discharge are controlled through the application of management practices or other means and the discharge does not cause a violation of water quality objectives. The Energy Commission expects that control measures would be implemented in an iterative manner as needed to meet applicable receiving water quality objectives.

A. Regionwide Prohibitions

1. The discharge of waste[i] that causes violation of any narrative water quality objective contained in the Basin Plan, including the Nondegradation Objective, is prohibited.
2. The discharge of waste that causes a violation of any numeric water quality objective contained in the Basin Plan is prohibited.
3. Where any numeric or narrative water quality objective contained in the Basin Plan is already being violated, the discharge of waste that causes further degradation or pollution is prohibited.
4. The discharge of untreated sewage, garbage, or other solid wastes into surface waters of the Lahontan Region is prohibited. (For the purposes of this prohibition, "untreated sewage" is that which exceeds secondary treatment standards of the Federal Water Pollution Control Act, which are incorporated in the Basin Plan in section 4.4 under "Surface Water Disposal of Sewage Effluent.")
5. For municipal[ii] and industrial[iii] discharges:
   a. The discharge, bypass, or diversion of raw or partially treated sewage, sludge, grease, or oils to surface waters is prohibited.
   b. The discharge of wastewater except to the designated disposal site (as defined and in accordance with California Water Code [Water Code] section 13000 et seq.) is prohibited.
   c. The discharge of industrial process wastes[iv] to surface waters designated for the Municipal and Domestic Supply (MUN) beneficial use is prohibited.

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[i] "Waste" is defined to include any waste or deleterious material including, but not limited to, waste earthen materials (such as soil, silt, sand, clay, rock, or other organic or mineral material) and any other waste as defined in the California Water Code § 13050(d).

[ii] "Municipal waste" is defined in section 4.4 of the Basin Plan.

[iii] "Industry" is defined in section 4.7 of the Basin Plan.

[iv] "Industrial process wastes" are wastes produced by industrial activities that result from one or more actions, operations, or treatments which modify raw material(s) and that may (1) add to or create within the effluent, waste, or receiving water a constituent or constituents not present prior to processing, or (2) alter water temperature and/or the concentration(s) of one or more naturally occurring constituents within the effluent, waste or receiving water. Certain non-storm water discharges may occur at industrial facilities that are not considered to be industrial process wastes for the purposes of Prohibition 5(c). Examples

The discharge of industrial process wastes to surface waters not designated for the MUN use may be permitted if such discharges comply with the *General Discharge Limitations* in section 4.7 of the Basin Plan and if appropriate findings under State and federal anti-degradation regulations can be made.

Prohibitions 5(b) and 5(c) do not apply to industrial storm water. For control measures applicable to industrial storm water, see section 4.3 of the Basin Plan, entitled "Stormwater Runoff, Erosion, and Sedimentation," specifically the requirements, which mandate the use of best available technology economically available (BAT) and best conventional pollution control technology (BCT) to reduce pollutants, and any more stringent controls necessary to meet water quality standards. Compliance with the requirements of a variety of laws and regulations for the control of hazardous materials and hazardous wastes may help to reduce potential storm water pollutants. Such programs include State and local laws to control toxic air pollutants, hazardous material storage and emergency response planning, the workers' right-to-know program, and hazardous waste source reduction and management review.

Prohibitions 5(b) and 5(c) do not apply to surface water disposal of treated groundwater. For control measures applicable to surface water disposal of treated ground water, see Lahontan Regional Water Quality Board Order No. R6T-2004-0025.

B. ISEGS Project Discharge Prohibitions

1. Activities and waste discharges associated with the ISEGS project must not cause or threaten to cause a nuisance or pollution as defined in Water Code section 13050.
2. The discharge, including discharges of fill material, must be limited to that described in the applicant's final Drainage, Erosion, and Sediment Control Plan.
3. The discharge or deposition of any wastes into channels, surface water, or any place where it would be discharged or deposited where it would be eventually transported to surface waters, including the 100-year floodplain, must not contain or consist of any substance in concentrations toxic to animal or plant life.
4. The discharge or deposition of any wastes into channels, surface water, or any place where it would be discharged or deposited where it would be eventually transported to surface waters, including the 100-year floodplain, must not contain or consist of oil or other floating materials from any activity in quantities sufficient to cause deleterious bottom deposits, turbidity, or discoloration in surface waters.

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include: fire hydrant flushing, atmospheric condensates from refrigeration and air conditioning systems, and landscape watering.

5. The discharge of waste, as defined in the Water Code that causes violation of any narrative water quality objective contained in the Basin Plan is prohibited.
6. The discharge of waste that causes violation of any numeric water quality objective contained in the Basin Plan is prohibited.
7. Where any numeric or narrative water quality objective contained in the Basin Plan is already being violated, the discharge of waste that causes further degradation or pollution (as defined in Water Code section 13050) is prohibited.
8. The discharge of septic tank pumpings (septage) or chemical toilet wastes to other than a sewage treatment plant or a waste hauler is prohibited.

C. Requirements

1. The applicant shall develop a final Storm Water Pollution Prevention Program (SWPPP) that is consistent with the requirements of State Water Board's General Permit No. CAS00001 and General Permit No. CAS00002. This SWPPP, or any future revision to this SWPPP, shall be implemented after approval by the BLM Authorized Officer.
2. The applicant must, at all times, maintain appropriate types and sufficient quantities of material on site to contain any spill or inadvertent release of materials that may cause a condition of pollution or nuisance if the materials reach waters of the State.
3. Discharges of wastewater generated by the ISEGS project's operations are not allowed to be released to the offsite environment.
4. The applicant must permit BLM Authorized Officer or its authorized representative upon presentation of credentials:
   a. Entry onto ISEGS project premises;
   b. Access to copy any record required to be kept under the terms and conditions of the Record of Decision (ROD);
   c. Inspection of any treatment equipment, monitoring equipment, or monitoring method required by the ROD;
   d. Sampling of any discharge or surface water covered by the ROD.
5. The applicant must immediately notify the BLM Authorized Officer by telephone whenever an adverse condition occurs as a result of this discharge. Such a condition includes, but is not limited to, a violation of the conditions of the ROD, a significant spill of petroleum products or toxic chemicals, or damage to control facilities that would cause noncompliance. A written notification of the adverse condition must be provided to the BLM Authorized Officer within two weeks of occurrence. The written notification must identify the adverse condition, describe the actions necessary to remedy the condition, and specify a timetable, subject to any modifications by BLM Authorized Officer, for the remedial actions.

6. The applicant must comply with the *Surface Water Monitoring and Reporting Program* Attachment 3.

III **Provisions**

A. Special Provisions for Fill Impacts to State Waters

1. Detailed final grading plans must be provided to the BLM Authorized Officer a minimum of 90 days prior to commencement of construction activities.
2. Construction equipment must be clean and free from oil, grease, and loose metal material and must be removed from service if necessary to protect water quality.
3. Restoration of temporary disturbances and temporary discharges of fill to waters of the State must be achieved immediately following completion of work in an area of the temporary impacts. Restoration must include implementing measures to fully restore conditions to support all beneficial uses for the water body temporarily impacted in the shortest feasible time. Restoration must include, but is not limited to, grading to pre-project contours and revegetation with native species. The applicant must implement Best Management Practices (BMPs) to control erosion and runoff from areas associated with temporary fills.
4. Mitigation for 29.2 acres of permanent and long-term impacts must be proposed prior to initiation of construction and approved by the BLM Authorized Officer.
5. No debris, cement, concrete (or wash water there from), oil, or petroleum products must be allowed to enter into or be placed where it may be washed from the ISEGS project site by rainfall or runoff into waters of the State. When operations are completed, any excess material must be removed from the ISEGS project work area and any areas adjacent to the work area where such material may be transported into waters of the State.
6. No equipment may be operated in areas of flowing or standing water; no fueling, cleaning, or maintenance of vehicles or equipment must take place within any areas where a discharge to ephemeral channels or other waters of the State may occur; construction materials and heavy equipment must be stored outside of the channel perimeter of the waters of the State. When work within the boundaries of waters of the State is necessary, the entire stream flow must be diverted around the work area, temporarily, as needed to control waste discharge.
7. The applicant must immediately notify the BLM's Authorized Officer by telephone whenever an adverse condition occurs as a result of this discharge. Such a condition includes, but is not limited to, a violation of these mitigation measures, a significant spill of petroleum products or toxic chemicals, or damage to control facilities that would cause noncompliance. A written notification of the adverse condition must be provided to the BLM's Authorized Officer within two weeks of the occurrence. The written notification

must identify the adverse condition, describe the actions necessary to remedy the condition, and specify a timetable subject to any modifications by BLM's Authorized Officer for the remedial actions.

B. Special Provisions for Storm Water

1. The applicant must ensure that storm water discharges and non-storm water discharges do not cause or contribute to an exceedance of any applicable water quality standards.
2. Industrial storm water discharges must use best available technology economically available (BAT) and best conventional pollution control technology (BCT) to reduce pollutants, and any more stringent controls necessary to meet water quality standards.
3. Post-construction storm water flows (volume and velocity) emanating from the ISEGS project site must not exceed two (2) percent of the volume and five (5) percent of the peak velocity discharge of the predevelopment levels. Runoff from newly constructed impervious areas that is greater than predevelopment levels must be treated and detained to predevelopment runoff levels. Methods such as low impact development may be used to achieve this requirement (see State Board Resolution No. 2008-0030).
4. The applicant must implement BMPs to prevent or reduce the discharge of wastes associated with water contacting construction materials or equipment.
5. The applicant must provide effective cover, mulch, fiber blankets, or other erosion control for soils disturbed by construction activities.
6. The applicant must provide BMPs for erosion stabilization for all areas of disturbed soil regardless of time of year, including erosion from rainfall, non-storm water runoff, and wind.
7. The applicant must stabilize to prevent erosion all finished slopes, open space, utility backfill, and graded or filled lots within two weeks from when excavation or grading activity has been completed.
8. The applicant must control runon from offsite areas, route flows away from disturbed areas in a manner that does not cause onsite or offsite erosion, and provide controls to minimize runon and problems from storm water flows to the ISEGS project area from offsite areas.
9. The applicant must, at all times, maintain effective perimeter controls (i.e., control around the ISEGS project area and all areas where there could be erosion or sediment discharges from the site), and stabilize all construction entrances/exits sufficiently to control erosion and soil or sediment discharges from the site.
10. The applicant must properly install and effectively maintain all BMPs for storm drain inlets and perimeter controls, runoff control BMPs, and stabilized entrances/exits.

11. The applicant must ensure that construction activity traffic to and from the ISEGS project is limited to entrances and exits that employ effective controls to prevent offsite tracking of soil.
12. The applicant must ensure that all storm drain inlets, perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits are maintained and protected from activities that could reduce their effectiveness.
13. The applicant must comply with the following source control requirements:
    a. Maintain vegetative cover to the extent possible by developing the ISEGS project in a way that reduces the amount of soil exposed to erosion at any time.
    b. Inspect and remove accumulated deposits of soil at all inlets to the storm drain system at frequent intervals during rainy periods.
    c. Provide buffer strips and/or vegetation protection fencing between the active construction area and any water bodies.
    d. Provide "good housekeeping" measures for construction materials, waste management, vehicle storage and maintenance, and landscape materials at all times including, but not limited to, the list of required measures in Attachment 2 of the *Surface Water Monitoring and Reporting Program*, (Attachment 3), which is made a part of these requirements.
14. The applicant must maintain, in perpetuity, post-construction control and treatment measures for storm water, or must identify in writing to the BLM's Authorized Officer, the entity that is legally responsible for maintaining the post-construction controls at the ISEGS project site.
15. The applicant shall have in place adequate emergency response plans in order to clean up any spill or release of any waste at the ISEGS project site.

Soil And Water Resources - Appendix D
Surface Water Monitoring And Reporting Program For Wastewater Discharge

I. Monitoring

A. General Requirements

1. The applicant must comply with the "General Provisions for Monitoring and Reporting," which is attached to and made part of this Monitoring and Reporting Program (Attachment A).
2. In addition to General Provision 1 of Attachment A, the following provisions apply to sampling and analysis under this program:
   a. Quality assurance/quality control (QA/QC) procedures must be followed and a QA/QC plan must be included in the Sampling and Analysis Plan (SAP) that is provided to the California Energy Commission (Energy Commission). The SAP may be part of the Storm Water Pollution Prevention Program (SWPPP).
   b. The applicant may conduct their own field analysis of pH and turbidity if the applicant has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.
   c. All monitoring instruments and equipment (including an applicant's own field instruments for measuring pH and turbidity) must be calibrated and maintained in accordance with manufacturer's specifications to ensure accurate measurements.
   d. With the exception of field analyses conducted by the applicant for pH and turbidity, all analyses must be sent to and conducted at a laboratory certified for such analysis by the California Department of Public Health.
3. The applicant must comply with the "Good Housekeeping Best Management Practices," which is attached to and made part of this Monitoring and Reporting Program (Attachment B).

B. Construction Site Storm Event Water Monitoring

The applicant must monitor site precipitation continuously and keep a record of storm events that produce more than 0.5 inch of precipitation at the site. During storms and/or within one business day after each 0.5 inch of precipitation from a storm event, the applicant must visually observe and document observations of storm water discharges from the site. For visual observations, the applicant must look for and document the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

The applicant must visually observe and document observations of the discharge of stored or contained storm water that is discharged subsequent to a storm event. The applicant is only required to visually observe such discharges if they occur during daylight hours. Stored or contained storm water that will likely

discharge after operating hours due to anticipated precipitation must be observed prior to the discharge to determine whether controls and best management practices (BMPs) are in place and functioning as required.

For the purposes of these requirements, a "potential storm event" is defined as any storm event with a 30 percent or greater chance of precipitation as predicted by the National Weather Service's nearest weather station for the local climate zone. Forty-eight (48) hours prior to each potential storm event, the applicant must visually observe and implement appropriate corrective action for:

1. all storm water drainage areas, to identify any spills, leaks, or uncontrolled pollutant sources,
2. all BMPs (see Attachment 3B), to identify whether they have been properly installed and maintained, and
3. any storm water storage and containment areas, to detect leaks and ensure maintenance of adequate freeboard.

Within one business day after each storm event that produces precipitation of 0.5 inch or more, the applicant must conduct a post-storm event inspection to:

a. identify whether BMPs were adequately designed, implemented, and effective,
b. identify if and where additional BMPs are needed, and where BMPs are in need of maintenance.

Within one business day after the initial 0.5 inch of precipitation from a storm event, and every 1 inch thereafter, the applicant must collect and analyze samples of storm water discharged from any detention basins. If no discharge occurs from a basin, no sample is required, but the absence of discharge must be documented.

Storm water sampling and analyses must be performed in accordance with the following requirements:

a. The applicant must analyze the samples for pH and turbidity.
b. The applicant is not required to physically collect samples or conduct visual observations during dangerous weather conditions or outside of scheduled site operation hours.

The applicant must perform sampling of storm water discharges from all drainage areas associated with construction activity. The storm water discharge collected and observed must represent the worst quality storm water discharge in each drainage area based on visual observation of the water and upstream conditions. For example, if there has been concrete work recently in an area, or drywall scrap is exposed to the rain, a pH sample must be taken of drainage from the relevant work area. Similarly, if muddy water is flowing through some parts of a silt fence, samples must be taken of the muddy water even if most water flowing through the fence is clear.

C. Construction Site Monitoring

1. On a daily basis, the applicant must inspect all public and private paved roads serving the ISEGS project and daily remove, by vacuuming or sweeping, visible accumulations of sediment or other construction activity-related materials that are deposited on the roads. All inspections under this provision must be documented in writing.
2. The applicant must ensure that inspections and observations at locations where runoff may discharge from the ISEGS project site are performed weekly, and at least once each 24-hour period during extended storm events, to identify any problems and/or BMPs that:
   a. need maintenance to operate effectively,
   b. have failed, or
   c. are inadequate to achieve effective control.
3. The applicant must visually observe construction areas and each drainage area for the presence of (or indication of prior) non-storm water discharges and their sources to ensure that all BMPs are in place and effective.
   a. One visual observation must be conducted quarterly in each of the following periods: January through March, April through June, July through September, and October through December. Visual observations are only required during daylight hours (sunrise to sunset).
   b. Visual observations must document evidence of any non-storm water discharge, pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. The applicant must maintain onsite records indicating the personnel performing the visual observation, the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate non-storm water discharges and to reduce or prevent pollutants from contacting non-storm water discharges.
4. The applicant must monitor and report runon from surrounding areas that may contribute to exceedances or excursions from requirements (violations).

D. Post-Construction Monitoring

On a semi-annual basis, the applicant must inspect and document inspections of post-construction treatment controls at the ISEGS project. Maintenance must be provided to address any controls that are not in compliance with requirements.

E. Receiving Water Monitoring

1. Receiving water sampling must be conducted at the sample locations designated in the final SWPPP.
2. Twice monthly and at no less than 10-day intervals from November through May of each year, the applicant must sample the ISEGS project's receiving waters with grab samples. The samples must be analyzed, at a minimum, for the following constituents:

a. Turbidity,
b. Temperature,
c. Dissolved Oxygen,
d. Suspended Solids,
e. Total Dissolved Solids, and
f. pH.

If no water is present (documented by photographs), no sampling is required.

3. The applicant must also sample the receiving waters for the above parameter(s) when discharge from any detention basin occurs.

II. Reporting

A. Required Program Reports

1. The applicant must develop and implement a final SWPPP, as described in II.B, below, and provide the final SWPPP to the BLM Authorized Officer 90 days prior to commencement of construction activities. The SWPPP must include receiving water monitoring locations as required above.
2. The applicant must provide a Sampling and Analysis Plan (SAP) as referenced in I.A, above, to the BLM Authorized Officer 90 days prior to commencement of construction activities. The SAP may be part of the SWPPP as described under I.A.2.

B. Storm Water Pollution Prevention Program

1. The final SWPPP must be developed and implemented to address the following objectives:
   a. To demonstrate that the site is in compliance with these requirements (Requirements in Attachment 2 and this Monitoring and Reporting Program). To determine whether immediate corrective actions, additional BMP implementation, or SWPPP revisions are necessary to reduce pollutants and wastes in storm water discharges and non-storm water discharges; and
   b. To determine whether BMPs included in the SWPPP are effective in preventing or reducing pollutants in storm water discharges.
2. The applicant must develop a final SWPPP that includes all monitoring procedures and instruction, location maps, forms, and checklists as required in these requirements and this MRP.

C. Storm Water Pollution Prevention Plan Annual Report

1. The applicant must prepare and provide an annual report no later than January 30 of each year.
2. The Annual Report must include a summary and evaluation of all sampling and analysis results, original laboratory reports, a summary of all corrective actions taken during the compliance year, and identification of any

recommended compliance activities or corrective actions that were not implemented.

3. The Annual Report must include all records and reports of visual observations and sample collection exceptions, the analytical method, method reporting unit, and method detection limit of each analytical parameter.

D. Records

1. The applicant must maintain records on site of all visual observations, personnel performing the observations, observation dates, weather condition, locations observed, and corrective actions taken in response to the observations.
2. All inspections and observations pursuant to Section I.C. above must be documented in writing and must include:
   a. Inspector's name, title, and signature.
   b. Inspection date and date the inspection report was written.
   c. Weather information: estimate of beginning of storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall (inches).
   d. A list and description of BMPs evaluated and any deficiencies noted. If there are no deficiencies, the report must indicate (under penalty of perjury) that the ISEGS project is in compliance with these discharge requirements.
   e. Report the presence of noticeable odors or any visible sheen on the surface of any discharges.
   f. Corrective actions required, including any changes necessary to comply with requirements, and implementation dates for completing corrective actions.
   g. Photographs taken during the inspection.
3. Records of all storm water monitoring information and copies of all reports (including Annual Reports) required by these requirements must be retained for a period of at least three years from the date of the sample, measurement, report, or application. This period may be extended when requested by the BLM Authorized Officer. Records must be retained on site while construction is ongoing. The records must include:
   a. The date, place, time of project inspections, sampling, visual observation, and/or measurement, including precipitation;
   b. The individual(s) who performed the project inspections, sampling, visual observations, and/or measurement;
   c. The date and approximate time of analyses;
   d. The individual(s) and company who performed the analyses;

e. A summary of all analytical results from the last five years, the method detection limits and reporting units, and the analytical techniques or methods used;

f. QA/QC records and results;

g. Non-storm water discharge inspections and visual observations and storm water discharge visual observation records; and

h. Visual observation and sample collection exception records.

Attachment A
General Provisions For Monitoring And Reporting

1. Sampling And Analysis
   a. All analyses shall be performed in accordance with the current edition(s) of the following documents:
      i. Standard Methods for the Examination of Water and Wastewater, American Public Health Association, et al.
      ii. Methods for Chemical Analysis of Water and Wastes, USEPA
   b. All analyses shall be performed in a laboratory certified to perform such analyses by the California Department of Public Health or a laboratory approved by the BLM Authorized Officer. Specific methods of analysis must be identified on each laboratory report.
   c. Any modifications to the above methods to eliminate known interferences shall be reported with the sample results. The methods used shall also be reported. If methods other than the methods listed above are used, the exact methodology must be submitted for review and must be approved by the BLM Authorized Officer prior to use.
   d. The applicant shall establish chain-of-custody procedures to insure that specific individuals are responsible for sample integrity from commencement of sample collection through delivery to an approved laboratory. Sample collection, storage, and analysis shall be conducted in accordance with an approved SAP. The most recent version of the approved SAP shall be kept at the ISEGS project.
   e. The applicant shall calibrate and perform maintenance procedures on all monitoring instruments and equipment to ensure accuracy of measurements, or shall insure that both activities will be conducted.
   f. A grab sample is defined as an individual sample collected in fewer than 15 minutes.
   g. A composite sample is defined as a combination of no fewer than eight individual samples obtained over the specified sampling period at equal intervals. The volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling. The sampling period shall equal the discharge period, or 24 hours, whichever period is shorter.
2. Operational Requirements
   h. Sample Results

      The applicant shall maintain all sampling and analytical results including: strip charts; date, exact place, and time of sampling; date analyses were performed; sample collector's name; analyst's name; analytical techniques used; and results of all analyses. Such records shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved

litigation regarding this discharge, or when requested by the BLM Authorized Officer.

i. Operational Log

An operation and maintenance log shall be maintained at the ISEGS project. All monitoring and reporting data shall be recorded in a permanent log book.

3. Reporting

j. For every item where the requirements are not met, the applicant shall submit a statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time, and shall submit a timetable for correction.

k. All sampling and analytical results shall be made available to the BLM Authorized Officer upon request. Results shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the BLM Authorized Officer.

l. The applicant shall provide a brief summary of any operational problems and maintenance activities to the BLM Authorized Officer with each monitoring report. Any modifications or additions to, or any major maintenance conducted on, or any major problems occurring to the wastewater conveyance system, treatment facilities, or disposal facilities shall be included in this summary.

m. Monitoring reports shall be signed by:

iii. In the case of a corporation, by a principal executive officer at least of the level of vice-president or his duly authorized representative, if such representative is responsible for the overall operation of the ISEGS project from which the discharge originates;

iv. In the case of a partnership, by a general partner;

v. In the case of a sole proprietorship, by the proprietor; or

vi. In the case of a municipal, state or other public project, by either a principal executive officer, ranking elected official, or other duly authorized employee.

n. Monitoring reports are to include the name and telephone number of an individual who can answer questions about the report.

Attachment B
Good Housekeeping Best Management Practices

1. Good housekeeping measures for construction materials include:
   a. Maintaining an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced.
   b. Covering and berming loose stockpiled construction materials (e.g. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).
   c. Storing chemicals in watertight containers or in a bermed storage shed (completely enclosed) with appropriate secondary containment.
   d. Minimizing contact of construction materials with precipitation.
   e. Implementing BMPs to reduce or prevent the offsite tracking of loose construction and landscape materials.
2. Good housekeeping measures for waste management include:
   a. Preventing disposal of any rinse/wash waters or materials into the storm drain system.
   b. Berming sanitation facilities (e.g. Porta Potties) and preventing them from being kept within the curb and gutter or on sidewalks or adjacent to a storm drain.
   c. Cleaning or replacing sanitation facilities and inspecting them regularly for leaks and spills.
   d. Covering waste disposal containers when they are not in use and preventing them from overflowing.
   e. Berming and securely protecting stockpiled waste material from wind and rain at all times unless actively being used where a spill or spills would enter surface drainage systems.
   f. Implementing procedures to deal with hazardous and non-hazardous spills.
   g. Preparing and implementing a spill response and implementation plan prior to commencement of construction activities, including:
   h. Lining and berming of concrete washout areas so there is no leakage or overflow into the underlying soil or the surrounding areas. Washout areas must be positioned away from drain inlets and waterways and be clearly labeled.
3. Good housekeeping measures for vehicle storage and maintenance include:
   a. Not allowing oil, grease, or fuel to leak in to the soil.
   b. Placing all equipment or vehicles to be fueled, maintained and/or stored in a designated area fitted with appropriate BMPs.
   c. Cleaning leaks immediately and disposing of leaked materials and sorbents properly.
   d. Fixing leaks immediately or removing equipment for service.

4. To assess the potential pollutant sources and identify all areas of the site where good housekeeping or additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and non-storm water discharges, the applicant must assess and report on the following:
   a. The quantity, physical characteristic (liquid, powder, solid, etc.), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.
   b. The degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.
   c. The direct and indirect pathways that pollutants may be exposed to storm water discharges and non-storm water discharges. This must include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.
   d. Sampling, visual observation, and inspection records.
   e. Effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and non-storm water discharges.

Appendix B-5
Traffic Appendices

Traffic and Transportation Appendix A
Highway Capacity Manual

The *Highway Capacity Manual* is prepared by the Transportation Research Board, Committee on Highway Capacity and Quality of Service. It represents a concentrated, multi-agency effort by the Transportation Research Board, the Federal Highway Administration, the American Association of Highway and Transportation Officials, and other traffic/transportation related agencies. It is the most widely used resource for traffic analysis. Several versions of the Highway Capacity Manual have been published. The current edition was published in 2000. It contains concepts, guidelines, and computational procedures for computing the capacity and quality of service of various highway facilities, including freeways, signalized and unsignalized intersections, rural highways, and the effects of transit, pedestrians, and bicycles on the performance of these systems.

Level Of Service

The description and procedures for calculating capacity and level of service are found in the *Highway Capacity Manual 2000*. The *Highway Capacity Manual 2000* represents the latest research on capacity and quality of service for transportation facilities.

Quality of service requires quantitative measures to characterize operational conditions within a traffic stream. Level of service is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience.

Six levels of service are defined for each type of facility that has analysis procedures available. Letters designate each level, from A to F, with level of service A representing the best operating conditions and level of service F the worst. Each level of service represents a range of operating conditions and the driver's perception of these conditions. Safety is not included in the measures that establish service levels. A general description of service levels for various types of facilities is shown in **Table A-1**.

Traffic and Transportation Table A-1
Level of Service Description

Facility Type	Uninterrupted Flow	Interrupted Flow
	Freeways Multi-Lane Highways Two-Lane Highways Urban Streets	Signalized Intersections Unsignalized Intersections - Two-Way Stop Control - All-Way Stop Control
Level of Service		
A	Free-flow	Very low delay
B	Stable flow. Presence of other users noticeable.	Low delay
C	Stable flow. Comfort and convenience starts to decline.	Acceptable delay
D	High density stable flow	Tolerable delay
E	Unstable flow	Limit of acceptable delay
F	Forced or breakdown flow	Unacceptable delay

Source: Highway Capacity Manual 2000

Interrupted Flow

One of the more important elements limiting, and often interrupting, the flow of traffic on a highway is the intersection. Flow on an interrupted facility is usually dominated by points of fixed operation such as traffic signals and stop and yield signs. These all operate quite differently and have differing impacts on overall flow.

Signalized Intersections

The capacity of a highway is related primarily to the geometric characteristics of the facility, as well as to the composition of the traffic stream on the facility. Geometrics are a fixed, or non-varying, characteristic of a facility.

At the signalized intersection, an additional element is introduced into the concept of capacity: time allocation. A traffic signal essentially allocates time among conflicting traffic movements seeking use of the same physical space. The way in which time is allocated has a significant impact on the operation of the intersection and on the capacity of the intersection and its approaches.

Level of service for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions (i.e., in the absence of traffic control, geometric delay, any incidents, and any other vehicles). Specifically, level of service criteria for traffic signals is stated in terms of average control delay per vehicle, typically for a 15-minute analysis period. Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the ratio of green time to cycle length and the volume-tocapacity ratio for the lane group.

For each intersection analyzed, the average control delay per vehicle per approach is determined for the peak hour. A weighted average of control delay per vehicle is then determined for the intersection. A level of service designation is given to the control delay to better describe the level of operation. Descriptions of levels of service for signalized intersections can be found in **Table A-2**.

Traffic and Transportation Table A-2
Description of Level of Service for Signalized Intersections

Level of Service	Description
A	Very low control delay, up to 10 seconds per vehicle. Movement forward (progression) is extremely favorable, and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.
B	Control delay greater than 10 and up to 20 seconds per vehicle. There is good progression or short cycle lengths or both. More vehicles stop causing higher levels of delay.
C	Control delay greater than 20 and up to 35 seconds per vehicle. Higher delays are caused by fair progression or longer cycle lengths or both. Individual cycle failures may begin to appear. Cycle failure occurs when a given green phase does not serve a waiting line of vehicles, and overflow occurs. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.
D	Control delay greater than 35 and up to 55 seconds per vehicle. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volumes. Many vehicles stop, the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Control delay greater than 55 and up to 80 seconds per vehicle. The limit of acceptable delay. High delays usually indicate poor progression, long cycle lengths, and high volumes. Individual cycle failures are frequent.
F	Control delay in excess of 80 seconds per vehicle. Unacceptable to most drivers. Oversaturation and arrival flow rates exceed the capacity of the intersection. Many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to higher delay.

Source: Highway Capacity Manual 2000

The use of control delay, often referred to as signal delay, was introduced in the 1997 update to the *Highway Capacity Manual*. It represents a departure from previous updates. In the third edition of the *Highway Capacity Manual*, published in 1985 and the 1994 update to the third edition, delay only included stop delay. Thus, the level of service criteria listed in Table B differs from earlier criteria.

Unsignalized Intersections

The current procedures on unsignalized intersections were first introduced in the 1997 update to the *Highway Capacity Manual* and represent a revision of the methodology published in the 1994 update to the 1985 *Highway Capacity Manual*. The revised procedures use control delay as a measure of effectiveness to determine level of

service. Delay is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions (i.e., in the absence of traffic control, geometric delay, any incidents, and any other vehicles). Control delay is the increased time of travel for a vehicle approaching and passing through an unsignalized intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection.

Two-Way Stop Controlled Intersections

Two-way stop controlled intersections in which stop signs are used to assign the right-of-way, are the most prevalent type of intersection in the United States. At two-way stop-controlled intersections, the stop-controlled approaches are referred as the minor street approaches and can be either public streets or private driveways. The approaches that are not controlled by stop signs are referred to as the major street approaches.

The capacity of movements subject to delay is determined using the "critical gap" method of capacity analysis. Expected average control delay based on movement volume and movement capacity is calculated. A level of service designation is given to the expected control delay for each minor movement. Level of service is not defined for the intersection as a whole. Control delay is the increased time of travel for a vehicle approaching and passing through an all-way, stop-controlled intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection. A description of levels of service for two-way stop-controlled intersections is found in **Table A-3**.

Traffic and Transportation Table A-3
Description of Level of Service for Two-Way Stop Controlled Intersections

Level of Service	Description
A	Very low control delay less than 10 seconds per vehicle for each movement subject to delay.
B	Low control delay greater than 10 and up to 15 seconds per vehicle for each movement subject to delay.
C	Acceptable control delay greater than 15 and up to 25 seconds per vehicle for each movement subject to delay.
D	Tolerable control delay greater than 25 and up to 35 seconds per vehicle for each movement subject to delay.
E	Limit of acceptable control delay greater than 35 and up to 50 seconds per vehicle for each movement subject to delay.
F	Unacceptable control delay in excess of 50 seconds per vehicle for each movement subject to delay.

Source: Highway Capacity Manual 2000

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Appendix B-6
Visual Resources Appendices

Vendor Resources Appendix A
Energy Commission Visual Resource Analysis Evaluation Criteria

Energy Commission staff conducts a visual resource analysis according to Appendix G, "Environmental Checklist Form—Aesthetics," California Environmental Quality Act (CEQA). The CEQA analysis requires that commission staff make a determination of impact ranging from "Adverse and Significant" to "Not Significant."

Staff's analysis is based on Key Observation Points or KOPs. KOPs are photographs of locations within the project area that are highly visible to the public — for example, travel routes; recreational and residential areas; and bodies of water as well as other scenic and historic resources.

Those photographs are taken to indicate existing conditions without the project and then modified to include a simulation of the project. Consequently, staff has a visual representation of the viewshed before and after a project is introduced and makes its analysis accordingly. Information about that analytical process follows.

Visual Resource Analysis Without Project

When analyzing KOPs of existing conditions without the project, staff considers the following conditions: visual quality, viewer concern, visibility, number of viewers, duration of view. Those conditions are then factored into an overall rating of viewer exposure and viewer sensitivity. Information about each condition and rating follows.

Visual Quality

An expression of the visual impression or appeal of a given landscape and the associated public value attributed to the resource. Visual quality is rated from *high* to *low*. A high rating is generally reserved for landscapes viewers might describe as picture-perfect.

Landscapes rated high generally are memorable because of the way the components combine in a visual pattern. In addition, those landscapes are free from encroaching elements, thus retaining their visual integrity. Finally, landscapes with high visual quality are visually coherent and harmonious when each element is considered as part of the whole. On the contrary, landscapes rated *low* are often dominated by visually discordant human alterations.

Viewer Concern

Viewer concern represents the reaction of a viewer to visible changes in the viewshed — an area of land visible from a fixed vantage point. For example, viewers have a high expectation for views formally designated as a scenic area or travel corridor as well as for recreational and residential areas. Viewers generally expect that those views will be preserved. Travelers on highways and roads, including those in agricultural areas, are generally considered to have moderate viewer concerns and expectations.

However, viewers tend to have low-to-moderate viewer concern when viewing commercial buildings. And industrial uses typically have the lowest viewer concern. Regardless, the level of concern could be lower if the existing landscape contains

discordant elements. In addition, some areas of lower visual quality and degraded visual character may contain particular views of substantially higher visual quality or interest to the public.

Visibility

Visibility is a measure of how well an object can be seen. Visibility depends on the angle or direction of views; extent of visual screening; and topographical relationships between the object and existing homes, streets, or parks. In that sense, visibility is determined by considering any and all obstructions that may be in the sightline—trees and other vegetation; buildings; transmission poles or towers; general air quality conditions such as haze; and general weather conditions such as fog.

Number of Viewers

Number of viewers is a measure of the number of viewers per day who would have a view of the proposed project. *Number of viewers* is organized into the following categories: residential according to the number of residences; motorist according to the number of vehicles; and recreationists.

Duration of View

Duration of view is the amount of time to view the site. For example, a high or extended view of a project site is one reached across a distance in two minutes or longer. In contrast, a low or brief duration of view is reached in a short amount of time—generally less than ten seconds.

Viewer Exposure

Viewer exposure is a function of three elements previously listed, *visibility*, *number of* viewers, and *duration of view*. Viewer exposure can range from a *low* to *high*. A partially obscured and brief background view for a few motorists represents a low value; and unobstructed foreground view from a large number of residences represents a high value.

Visual Sensitivity

Visual sensitivity is comprised of three elements previously listed, *visual quality*, *viewer concern*, and *viewer exposure*. Viewer sensitivity tends to be higher for homeowners or people driving for pleasure or engaged in recreational activities and lower for people driving to and from work or as part of their work.

Visual Resource Analysis with Project

Visual resource analyses with photographic simulations of the project involve the elements of contrast, dominance, view blockage, and visual change. Information about each element follows.

Contrast

Contrast concerns the degree to which a project's visual characteristics or elements — form, line, color, and texture — differ from the same visual elements in the existing

landscape. The degree of contrast can range from *low* to *high*. A landscape with forms, lines, colors, and textures similar to those of a proposed energy facility is more visually absorbent; that is, more capable of accepting those characteristics than a landscape in which those elements are absent.[1] Generally, visual absorption is inversely proportional to visual contrast.

Dominance

Dominance is a measure of (a) the proportion of the total field of view occupied by the field; (b) a feature's apparent size relative to other visible landscape features; and (c) the conspicuousness of the feature due to its location in the view.

A feature's level of dominance is lower in a panoramic setting than in an enclosed setting with a focus on the feature itself. A feature's level of dominance is higher if it is (1) near the center of the view; (2) elevated relative to the viewer; or (3) has the sky as a backdrop. As the distance between a viewer and a feature increases, its apparent size decreases; and consequently, its dominance decreases. The level of dominance ranges from *low* to *high*.

View Blockage

The extent to which any previously visible landscape features are blocked from view constitutes view disruption. The view is also disrupted when the continuity of the view is interrupted. When considering a project's features, higher quality landscape features can be disrupted by lower quality project features, thus resulting in adverse visual impacts. The degree of view disruption can range from *none* to *high*.

Visual Change

Visual change is a function of *contrast*, *dominance*, and *view disruption*. Generally, *contrast* and *dominance* contribute more to the degree of visual change than does *view disruption*.

[1] Typically, the Energy Commission does not consider texture in its visual analyses.

Appendix C-1
Facility Design

FACILITY DESIGN

Prepared by Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

U.S. Bureau of Land Management (BLM) and California Energy Commission staff (hereafter jointly referred to as staff) conclude that the design, construction, and eventual closure of the Ivanpah Solar Electric Generating System (ISEGS) project and its linear facilities would likely comply with applicable engineering laws, ordinances, regulations, and standards. The proposed conditions of certification, below, would ensure compliance with these laws, ordinances, regulations, and standards. Conditions of Certification referred to herein serve the purpose of both the Energy Commission's Conditions of Certification for purposes of the California Environmental Quality Act (CEQA) and BLM's Mitigation Measures for purposes of the National Environmental Policy Act (NEPA).

INTRODUCTION

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

- verify that the laws, ordinances, regulations, and standards (LORS) that apply to the engineering design and construction of the project have been identified;
- verify that both the project and its ancillary facilities are sufficiently described, including proposed design criteria and analysis methods, in order to provide reasonable assurance that the project will be designed and constructed in accordance with all applicable engineering LORS, in a manner that also ensures the public health and safety;
- determine whether special design features should be considered during final design to address conditions unique to the site that could influence public health and safety; and
- describe the design review and construction inspection process and establish the conditions of certification used to monitor and ensure compliance with the engineering LORS, in addition to any special design requirements.

Subjects discussed in this analysis include:

- identification of the engineering LORS that apply to facility design;
- evaluation of the applicant's proposed design criteria, including identification of criteria essential to public health and safety;
- proposed modifications and additions to the application for certification (AFC) necessary for compliance with applicable engineering LORS; and
- conditions of certification proposed by staff to ensure that the project will be designed and constructed to assure public health and safety and comply with all applicable engineering LORS.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Lists of LORS applicable to each engineering discipline (civil, structural, mechanical, and electrical) are described in the AFC (BSE 2007a, Appendix 2.0). Key LORS are listed in **Facility Design Table 1** below.

Facility Design Table 1
Key Engineering Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	Description
Federal	Title 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health standards
State	2007 California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations)
Local	San Bernardino County regulations and ordinances
General	American National Standards Institute (ANSI) American Society of Mechanical Engineers (ASME) American Welding Society (AWS) American Society for Testing and Materials (ASTM)

SETTING

The ISEGS would be built on 4,073 acres located in Southern California's Mojave Desert, in San Bernardino County, approximately 3.1 miles west of the California/Nevada border. The site lies in seismic zone 3. For more information on the site and related project description, please see the **Project Description** section of this document. Additional engineering design details are contained in the AFC, Appendix 2.0 (BSE 2007a; CH2ML2008g) and in the applicant's updated Project Description (CH2ML2009f).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

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

PROPOSED PROJECT

SITE PREPARATION AND DEVELOPMENT

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage, and site access, in addition to the criteria for designing and constructing linear support facilities such as natural gas and electric transmission interconnections. The applicant proposes the use of accepted industry standards (see BSE 2007a, Appendix 2.0, for a representative list of applicable industry standards), design practices, and construction methods in preparing and developing the site. Staff concludes that this project, including its linear facilities, would most likely comply with all applicable site preparation LORS, and proposes conditions of certification (see below and the **Geology and Paleontology** section of this document) to ensure that compliance.

MAJOR STRUCTURES, SYSTEMS, AND EQUIPMENT

Major structures, systems, and equipment are defined as structures and their associated components or equipment that are necessary for power production; are costly or time consuming to repair or replace; are used for the storage, containment, or handling of hazardous or toxic materials; or could become potential health and safety hazards if not constructed according to applicable engineering LORS. Major structures and equipment are identified in the proposed Condition of Certification **GEN-2,** below. Typically, **Facility Design Table 2** in Condition of Certification **GEN-2** lists the major structures and equipment identified in the AFC and other project related information available before project licensing; this list is based on the preliminary design of the project. The master drawing and master specifications lists described in Condition of Certification **GEN-2**, however, include the project-related documents based on the project's detailed design and may include additional documents for structures and equipment not identified in **Facility Design Table 2**. (Detailed project design typically occurs after project licensing and is not available at this time.)

ISEGS would be designed and constructed to the 2007 California Building Standards Code (CBSC), also known as Title 24, California Code of Regulations, which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and other applicable codes and standards in effect when the design and construction of the project actually begin. If the initial designs are submitted to the chief building official (CBO) for review and approval after the update to the 2007 CBSC takes effect, the 2007 CBSC provisions would be replaced with the updated provisions.

Certain structures in a power plant may be required, under the CBC, to undergo dynamic lateral force (structural) analysis; others may be designed using the simpler static analysis procedure. In order to ensure that structures are analyzed according to their appropriate lateral force procedure, staff has included Condition of Certification

STRUC-1, below, which, in part, requires the project CBO's review and approval of the owner's proposed lateral force procedures before construction begins.

PROJECT QUALITY PROCEDURES

The project's AFC (BSE 2007a, § 2.3.2.5) describes a quality program intended to inspire confidence that its systems and components will be designed, fabricated, stored, transported, installed, and tested in accordance with all appropriate power plant technical codes and standards. Compliance with design requirements would be verified through specific inspections and audits. Implementation of this quality assurance/quality control (QA/QC) program would ensure that ISEGS is actually designed, procured, fabricated, and installed as described in this analysis.

COMPLIANCE MONITORING

Under section 104.1 in Appendix Chapter 1 of the CBC, the CBO is authorized and directed to enforce all provisions of the CBC. The Energy Commission itself serves as the building official and has the responsibility to enforce the code for all of the energy facilities it certifies. In addition, the Energy Commission has the power to interpret the CBC and adopt and enforce both rules and supplemental regulations that clarify application of the CBC's provisions.

The Energy Commission's design review and construction inspection process conforms to CBC requirements and ensures that all facility design conditions of certification are met. As provided by section 103.3 in Appendix Chapter 1 of the CBC, the Energy Commission appoints experts to perform design review and construction inspections and act as delegate CBOs on behalf of the Energy Commission. These delegates typically include the local building official and/or independent consultants hired to provide technical expertise that is not provided by the local official alone. The applicant, through permit fees provided by the CBC, section 108 in Appendix Chapter 1, pays the cost of these reviews and inspections. While building permits in addition to Energy Commission certification are not required for this project, the applicant, consistent with CBC section 108, would pay in lieu of CBC permit fees to cover the costs of these reviews and inspections.

Engineering and compliance staff would invite San Bernardino County or a third-party engineering consultant to act as CBO for this project. When an entity has been assigned CBO duties, Energy Commission staff would complete a memorandum of understanding (MOU) with that entity to outline both its roles and responsibilities and those of its subcontractors and delegates.

Staff has developed proposed conditions of certification to ensure public health and safety and compliance with engineering design LORS. Some of these conditions address the roles, responsibilities, and qualifications of the engineers who would design and build the proposed project (Conditions of Certification **GEN-1** through **GEN-8**). These engineers must be registered in California and sign and stamp every submittal of design plans, calculations, and specifications submitted to the CBO. These conditions require that every element of the project's construction (subject to CBO review and approval) be approved by the CBO before it is performed. They also require that

qualified special inspectors perform or oversee special inspections required by all applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility in scheduling construction activities, these conditions are written so that no element of construction (of permanent facilities subject to CBO review and approval) which could be difficult to reverse or correct could proceed without prior CBO approval. Elements of construction that are not difficult to reverse would be able to proceed without approval of the plans. The applicant would bear the responsibility to fully modify construction elements in order to comply with all design changes resulting from the CBO's subsequent plan review and approval process. Closure and Decommissioning Impacts and Mitigation The removal of a facility from service (decommissioning) when it reaches the end of its useful life ranges from mothballing, to the removal of all equipment and appurtenant facilities and subsequent restoration of the site. Future conditions that could affect decommissioning are largely unknown at this time.

In order to ensure that decommissioning would be completed in a manner that is environmentally sound and safe and would protect the public health and safety, the applicant would submit a decommissioning plan to the Energy Commission for review and approval before the project's decommissioning begins. The plan would include a discussion of:

- proposed decommissioning activities for the project and all appurtenant facilities that were constructed as part of the project;
- all applicable LORS, local/regional plans, and proof of adherence to those applicable LORS and local/regional plans;
- the activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and
- decommissioning alternatives other than complete site restoration.

Satisfying the above requirements should serve as adequate protection, even in the unlikely event that the project is abandoned. Staff has proposed general conditions (see **General Conditions**) to ensure that these measures are included in the Facility Closure Plan.

NO PROJECT / NO ACTION ALTERNATIVE

In the No Project / No Action Alternative, the proposed action would not be undertaken. The BLM land on which the project is proposed would continue to be managed within BLM's framework of a program of multiple use and sustained yield, and the maintenance of environmental quality [43 U.S.C. 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 BLM's land use plan, including another solar 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 this project is 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. For example, there are three large solar projects proposed on BLM land in Nevada within a few miles of the Ivanpah site. In addition, there are currently 66 applications for solar projects covering 611,692 acres pending with BLM in the California Desert District. The No Project / No Action Alternative would not cause any impacts associated with Facility Design.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments have been received from agencies or the public.

CONCLUSIONS AND RECOMMENDATIONS

The laws, ordinances, regulations, and standards (LORS) identified in the AFC and supporting documents directly apply to the project.

Staff has evaluated the proposed engineering LORS, design criteria, and design methods in the record, and concludes that the design, construction, and eventual closure of the project will likely comply with applicable engineering LORS.

The proposed conditions of certification will ensure that ISEGS is designed and constructed in accordance with applicable engineering LORS. This would be accomplished through design review, plan checking, and field inspections that would be performed by the CBO or other Energy Commission delegate. Staff would audit the CBO to ensure satisfactory performance.

Though future conditions that could affect decommissioning are largely unknown at this time, it can reasonably be concluded that if the project owner submits a decommissioning plan as required in the **General Conditions** portion of this document prior to decommissioning, decommissioning procedures would comply with all applicable engineering LORS.

Energy Commission staff recommends that:

1. the proposed conditions of certification be adopted to ensure that the project is designed and constructed in a manner that protects the public health and safety and complies with all applicable engineering LORS;

2. the project be designed and built to the 2007 CBSC (or successor standards, if in effect when initial project engineering designs are submitted for review); and
3. the CBO reviews the final designs, checks plans, and performs field inspections during construction and that BLM's Authorized Officer and Energy Commission staff audit and monitor the CBO to ensure satisfactory performance.

MITIGATION MEASURES/PROPOSED CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct, and inspect the project in accordance with the 2007 California Building Standards Code (CBSC), also known as Title 24, California Code of Regulations, which encompasses the California Building Code (CBC), California Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and all other applicable engineering LORS in effect at the time initial design plans are submitted to the chief building official (CBO) for review and approval (the CBSC in effect is the edition that has been adopted by the California Building Standards Commission and published at least 180 days previously). The project owner shall ensure that all the provisions of the above applicable codes are enforced during the construction, addition, alteration, moving, demolition, repair, or maintenance of the completed facility (2007 CBC, Appendix Chapter 1, section 101.2, Scope). All transmission facilities (lines, switchyards, switching stations, and substations) are covered in the conditions of certification in the **Transmission System Engineering** section of this document.

In the event that the initial engineering designs are submitted to the CBO when the successor to the 2007 CBSC is in effect, the 2007 CBSC provisions shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction, or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

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

Verification: Within 30 days following receipt of the certificate of occupancy, the project owner shall submit to BLM's Authorized Officer and the Compliance Project Manager (CPM) a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation, and inspection requirements of the applicable LORS and the Energy Commission's decision have been met in the area of facility design. The project owner shall provide BLM's Authorized Officer and the CPM a copy of the certificate of occupancy within 30 days of receipt from the CBO (2007 CBC, Appendix Chapter 1, section 110, Certificate of Occupancy).

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

GEN-2 Before submitting the initial engineering designs for CBO review, the project owner shall furnish BLM's Authorized Officer, the CPM and the CBO with a schedule of facility design submittals and master drawing and master specifications lists. The schedule shall contain a list of proposed submittal packages of designs, calculations, and specifications for major structures and equipment. To facilitate audits by BLM's Authorized Officer and/or Energy Commission staff, the project owner shall provide specific packages to BLM's Authorized Officer and/or the CPM upon request.

Verification: At least 60 days (or within a project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO, BLM's Authorized Officer and to the CPM the schedule, the master drawing and master specifications lists of documents to be submitted to the CBO for review and approval. These documents shall be the pertinent design documents for the major structures and equipment listed in **Facility Design Table 2,** below. Major structures and equipment shall be added to or deleted from the table only with BLM's Authorized Officer and CPM approval. The project owner shall provide schedule updates in the monthly compliance report.

Facility Design Table 2
Major Structures and Equipment List

Equipment/System	Quantity (Plant)
Turbine Generator Foundation and Connections	3
Boiler Structure, Foundation and Connections	10
Air Cooled Condenser Structure, Foundation and Connections	3
Feed Water Preheater Structure, Foundation and Connections	3
Deaerator Structure, Foundation and Connections	3
Steam Distributor Structure, Foundation and Connections	3
Water Treatment Plant, Administration and Electrical Building Structure, Foundation and Connections	4
Water Storage Tanks Structure, Foundation and Connections	3
Maintenance Wing Structure, Foundation and Connections	3
Turbine Lubrication System Foundation and Connections	3
Emergency Generator Foundation and Connections	3
Diesel Fire Pump Foundation and Connections	3
Reheat Tower Structure, Foundation and Connections	3
Emergency Generator Exhaust Structure, Foundation and Connections	3
Pipe Bridge Structure, Foundation and Connections	3
Solar Fields and Towers Structures, Foundations and Connections	3 Lots
Evaporation Pits	3 Lots
Drainage Systems (including sanitary drain and waste)	3 Lots
High Pressure and Large Diameter Piping and Pipe Racks	3 Lots
HVAC and Refrigeration Systems	3 Lots
Temperature Control and Ventilation Systems (including water and sewer connections)	3 Lots
Building Energy Conservation Systems	3 Lots
Switchyard, Buses, and Towers	3 Lots
Substation	1 Lot
Electrical Duct Banks	3 Lots

GEN-3 The project owner shall make payments to the CBO for design review, plan checks, and construction inspections, based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. These fees may be consistent with the fees listed in the 2007 CBC (2007 CBC, Appendix Chapter 1, section 108, Fees; Chapter 1, section 108.4, Permits, Fees, Applications and Inspections), adjusted for inflation and other appropriate adjustments; may be based on the value of the facilities reviewed; may be based on hourly rates; or may be otherwise agreed upon by the project owner and the CBO.

Verification: The project owner shall make the required payments to the CBO in accordance with the agreement between the project owner and the CBO. The project owner shall send a copy of the CBO's receipt of payment to BLM's Authorized Officer and the CPM in the next monthly compliance report indicating that applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California-registered architect, structural engineer, or civil engineer, as the resident engineer (RE) in charge of the project (2007 California Administrative Code, section 4-209, Designation of Responsibilities). All transmission facilities (lines, switchyards, switching stations, and substations) are addressed in the conditions of certification in the **Transmission System Engineering** section of this document.

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

The RE shall:

1. Monitor progress of construction work requiring CBO design review and inspection to ensure compliance with LORS;
2. Ensure that construction of all facilities subject to CBO design review and inspection conforms in every material respect to applicable LORS, these conditions of certification, approved plans, and specifications;
3. Prepare documents to initiate changes in approved drawings and specifications when either directed by the project owner or as required by the conditions of the project;
4. Be responsible for providing project inspectors and testing agencies with complete and up-to-date sets of stamped drawings, plans, specifications, and any other required documents;
5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and
6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests when they do not conform to approved plans and specifications.

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

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications, and registration number of the

newly assigned engineer to the CBO for review and approval. The project owner shall notify BLM's Authorized Officer and the CPM of the CBO's approval of the new engineer.

Verification: At least 30 days (or within a project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the resume and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify BLM's Authorized Officer and the CPM of the CBO's approvals of the RE and other delegated engineer(s) within 5 days of the approval.

If the RE or the delegated engineer(s) is subsequently reassigned or replaced, the project owner has 5 days to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify BLM's Authorized Officer and the CPM of the CBO's approval of the new engineer within 5 days of the approval.

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: a civil engineer; a soils, geotechnical, or civil engineer experienced and knowledgeable in the practice of soils engineering; and an engineering geologist. Prior to the start of construction, the project owner shall assign at least one of each of the following California registered engineers to the project: a design engineer who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; a mechanical engineer; and an electrical engineer. (California Business and Professions Code section 6704 et seq., and sections 6730, 6731, and 6736 require state registration to practice as a civil engineer or structural engineer in California.) All transmission facilities (lines, switchyards, switching stations, and substations) are handled in "Conditions of Certification" in the **Transmission System Engineering** section of this document.

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

The project owner shall submit, to the CBO for review and approval, the names, qualifications, and registration numbers of all responsible engineers assigned to the project (2007 CBC, Appendix Chapter 1, section 104, Duties and Powers of Building Official).

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible

engineer to the CBO for review and approval. The project owner shall notify BLM's Authorized Officer and the CPM of the CBO's approval of the new engineer.

A. The civil engineer shall:

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

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

1. Review all the engineering geology reports;
2. Prepare the foundation investigations, geotechnical, or soils reports containing field exploration reports, laboratory tests, and engineering analysis detailing the nature and extent of the soils that could be susceptible to liquefaction, rapid settlement, or collapse when saturated under load (2007 CBC, Appendix J, section J104.3, Soils Report; Chapter 18, section 1802.2, Foundation and Soils Investigations);
3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with requirements set forth in the 2007 CBC, Appendix J, section J105, Inspections, and the 2007 California Administrative Code, section 4-211, Observation and Inspection of Construction (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both); and
4. Recommend field changes to the civil engineer and RE.

This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform to the predicted conditions used as the basis for design of earthwork or foundations (2007 CBC, Appendix Chapter 1, section 114, Stop Orders).

C. The engineering geologist shall:

1. Review all the engineering geology reports and prepare a final soils grading report; and
2. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 2007 California Administrative Code, section 4-211, Observation and Inspection of Construction (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both).

D. The design engineer shall:

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

E. The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform to all of the mechanical engineering design requirements set forth in BLM's Right-of-Way Decision and the Energy Commission's decision.

F. The electrical engineer shall:

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

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

At least 30 days (or within a project owner- and CBO-approved alternative time frame) prior to the start of construction, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible design engineer, mechanical engineer, and electrical engineer assigned to the project.
The project owner shall notify BLM's Authorized Officer and the CPM of the CBO's approvals of the responsible engineers within 5 days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has 5 days in which to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify BLM's Authorized Officer and the CPM of the CBO's approval of the new engineer within 5 days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, the project owner shall assign to the project a qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 2007 CBC, Chapter 17, section 1704, Special Inspections; Chapter 17A, section 1704A, Special Inspections; and Appendix Chapter 1, Section 109, Inspections. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in "Conditions of Certification" in the **Transmission System Engineering** section of this document.

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

The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;
2. Observe the work assigned for conformance with the approved design drawings and specifications;
3. Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO, BLM's Authorized Officer and the CPM for corrective action (2007 CBC, Chapter 17, section 1704.1.2, Report Requirements); and
4. Submit a final signed report to the RE, CBO, BLM's Authorized Officer and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans, specifications, and other provisions of the applicable edition of the CBC.

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

If the special inspector is subsequently reassigned or replaced, the project owner has 5 days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify BLM's Authorized Officer and the CPM of the CBO's approval of the newly assigned inspector within 5 days of the approval.

GEN-7 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend required corrective actions (2007 CBC, Appendix Chapter 1, section 109.6, Approval Required; Chapter 17, section 1704.1.2, Report Requirements). The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this condition of certification and, if appropriate, applicable sections of the CBC and/or other LORS.

Verification: The project owner shall transmit a copy of the CBO's approval of any corrective action taken to resolve a discrepancy to BLM's Authorized Officer and the CPM in the next monthly compliance report. If any corrective action is disapproved, the project owner shall advise BLM's Authorized Officer and the CPM, within 5 days, of the reason for disapproval and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work that has undergone CBO design review and approval. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. The project owner shall notify BLM's Authorized Officer and the CPM after obtaining the CBO's final approval. The project owner shall retain one set of approved engineering plans, specifications, and calculations (including all approved changes) at the project site or at an alternative site approved by BLM's Authorized Officer and the CPM during the operating life of the project (2007 CBC, Appendix Chapter 1, section 106.3.1, Approval of Construction Documents). Electronic copies of the approved plans, specifications, calculations, and marked-up as-builts shall be provided to the CBO for retention by BLM's Authorized Officer and the CPM.

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

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

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

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils, geotechnical, or foundation investigations reports required by the 2007 CBC, Appendix J, section J104.3, Soils Report, and Chapter 18, section 1802.2, Foundation and Soils Investigation.

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

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible soils engineer, geotechnical engineer, or the civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications, and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area (2007 CBC, Appendix Chapter 1, section 114, Stop Work Orders).

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

CIVIL-3 The project owner shall perform inspections in accordance with the 2007 CBC, Appendix Chapter 1, section 109, Inspections, and Chapter 17, section 1704, Special Inspections. All plant site-grading operations, for which a grading permit is required, shall be subject to inspection by the CBO.

If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, BLM's Authorized Officer and the CPM (2007 CBC, Chapter 17, section 1704.1.2, Report Requirements). The project owner shall prepare a written report, with copies to the CBO, BLM's Authorized Officer and the CPM, detailing all discrepancies, non-compliance items, and the proposed corrective action.

Verification: Within 5 days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO, BLM's Authorized Officer and the CPM a non-conformance report (NCR) and the proposed corrective action for review and approval.

Within 5 days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO, BLM's Authorized Officer and the CPM. A list of NCRs for the reporting month shall also be included in the following monthly compliance report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage work, the project owner shall obtain the CBO's approval of the final grading plans (including final changes) for the erosion and sedimentation control work. The civil engineer shall state that the work within his/her area of responsibility was done in accordance with the final approved plans (2007 CBC, Chapter 17, section 1703.2, Written Approval).

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

STRUC-1 Prior to the start of any increment of construction of any major structure or component listed in **Facility Design Table 2** of Condition of Certification **GEN-2**, above, the project owner shall submit to the CBO for design review and approval the proposed lateral force procedures for project structures and the applicable designs, plans, and drawings for project structures. Proposed lateral force procedures, designs, plans, and drawings shall be those for the following items (from **Table 2**, above):

1. Major project structures;
2. Major foundations, equipment supports, and anchorage; and
3. Large field-fabricated tanks.

Construction of any structure or component shall not begin until the CBO has approved the lateral force procedures to be employed in designing that structure or component.

The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;
2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (for example, highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations,

and specifications (2007 CBC, Appendix Chapter 1, section 109.6, Approval Required);
3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation (2007 California Administrative Code, section 4-210, Plans, Specifications, Computations and Other Data);
4. Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations, and specifications shall be signed and stamped by the responsible design engineer (2007 CBC, Appendix Chapter 1, section 106.3.4, Design Professional in Responsible Charge); and
5. Submit to the CBO the responsible design engineer's signed statement that the final design plans conform to applicable LORS (2007 CBC, Appendix Chapter 1, section 106.3.4, Design Professional in Responsible Charge).

Verification: At least 60 days (or within a project owner- and CBO-approved alternative time frame) prior to the start of any increment of construction of any structure or component listed in **Facility Design Table 2** of Condition of Certification **GEN-2**, above, the project owner shall submit to the CBO the above final design plans, specifications, and calculations, with a copy of the transmittal letter to BLM's Authorized Officer and the CPM.

The project owner shall submit to BLM's Authorized Officer and the CPM, in the next monthly compliance report, a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and comply with the requirements set forth in applicable engineering LORS.

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

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);
2. Concrete pour sign-off sheets;
3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);
4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing [NDT] procedure and results, welder qualifications, certifications, qualified procedure description or number [ref: AWS}); and

5. Reports covering other structural activities requiring special inspections shall be in accordance with the 2007 CBC, Chapter 17, section 1704, Special Inspections, and Section 1709.1, Structural Observations.

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within 5 days, prepare and submit an NCR describing the nature of the discrepancies and the proposed corrective action to the CBO, with a copy of the transmittal letter to BLM's Authorized Officer and the CPM (2007 CBC, Chapter 17, section 1704.1.2, Report Requirements). The NCR shall reference the condition(s) of certification and the applicable CBC chapter and section. Within 5 days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to BLM's Authorized Officer and the CPM within 15 days. If disapproved, the project owner shall advise BLM's Authorized Officer and the CPM, within 5 days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 2007 CBC, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes and shall give to the CBO prior notice of the intended filing (2007 CBC, Appendix Chapter 1, section 106.1, Submittal Documents; section 106.4, Amended Construction Documents; 2007 California Administrative Code, section 4-215, Changes in Approved Drawings and Specifications).

Verification: On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to BLM's Authorized Officer and the CPM. The project owner shall notify BLM's Authorized Officer and the CPM, via the monthly compliance report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in the 2007 CBC, Chapter 3, Table 307.1(2), shall, at a minimum, be designed to comply with the requirements of that chapter.

Verification: At least 30 days (or within a project owner- and CBO-approved alternate time frame) prior to the start of installation of the tanks or vessels containing the above-specified quantities of toxic or hazardous materials, the project owner shall submit to the CBO for design review and approval final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification. The project owner shall send copies of the CBO approvals of plan checks to BLM's Authorized Officer and the CPM in the following monthly compliance report. The project owner shall also transmit a copy of the CBO's inspection approvals to BLM's Authorized

Officer and the CPM in the monthly compliance report following completion of any inspection.

MECH-1 The project owner shall submit, for CBO design review and approval, the proposed final design, specifications, and calculations for each plant major piping and plumbing system listed in **Facility Design Table 2**, Condition of Certification **GEN-2**, above. Physical layout drawings and drawings not related to code compliance and life safety need not be submitted. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of that construction (2007 CBC, Appendix Chapter 1, section 106.1, Submittal Documents; section 109.5, Inspection Requests; section 109.6, Approval Required; 2007 California Plumbing Code, section 301.1.1, Approvals).

The responsible mechanical engineer shall stamp and sign all plans, drawings, and calculations for the major piping and plumbing systems, subject to CBO design review and approval, and submit a signed statement to the CBO when the proposed piping and plumbing systems have been designed, fabricated, and installed in accordance with all of the applicable laws, ordinances, regulations and industry standards (2007 CBC, Appendix Chapter 1, section 106.3.4, Design Professional in Responsible Charge), which may include, but are not limited to:

- American National Standards Institute (ANSI) B31.1 (Power Piping Code);
- ANSI B31.2 (Fuel Gas Piping Code);
- ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
- ANSI B31.8 (Gas Transmission and Distribution Piping Code);
- Title 24, California Code of Regulations, Part 5 (California Plumbing Code);
- Title 24, California Code of Regulations, Part 6 (California Energy Code, for building energy conservation systems and temperature control and ventilation systems);
- Title 24, California Code of Regulations, Part 2 (California Building Code); and
- San Bernardino County codes.

The CBO may deputize inspectors to carry out the functions of the code enforcement agency (2007 CBC, Appendix Chapter 1, section 103.3, Deputies).

Verification: At least 30 days (or within a project owner- and CBO-approved alternative time frame) prior to the start of any increment of major piping or plumbing construction listed in **Facility Design Table 2**, Condition of Certification **GEN-2,** above, the project owner shall submit to the CBO for design review and approval the final plans, specifications, and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with applicable LORS, and shall send BLM's Authorized Officer and the CPM a copy of the transmittal letter in the next monthly compliance report.

The project owner shall transmit to BLM's Authorized Officer and the CPM, in the monthly compliance report following completion of any inspection, a copy of the transmittal letter conveying the CBO's inspection approvals.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal/OSHA), prior to operation, the code certification papers and other documents required by applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal/OSHA inspection of that installation (2007 CBC, Appendix Chapter 1, section 109.5, Inspection Requests).

The project owner shall:

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

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

The project owner shall transmit to BLM's Authorized Officer and the CPM, in the monthly compliance report following completion of any inspection, a copy of the transmittal letter conveying the CBO's and/or Cal/OSHA inspection approvals.

MECH-3 The project owner shall submit to the CBO for design review and approval the design plans, specifications, calculations, and quality control procedures for any heating, ventilating, air conditioning (HVAC), or refrigeration system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

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

drawings, and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications, and calculations conform with the applicable LORS (2007 CBC, Appendix Chapter 1, section 109.3.7, Energy Efficiency Inspections; section 106.3.4, Design Professionals in Responsible Charge).

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

ELEC-1 Prior to the start of any increment of electrical construction for all electrical equipment and systems 480 volts or higher (see a representative list, below), with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications, and calculations (2007 CBC, Appendix Chapter 1, section 106.1, Submittal Documents). Upon approval, the above-listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS (2007 CBC, Appendix Chapter 1, section 109.6, Approval Required; section 109.5, Inspection Requests). All transmission facilities (lines, switchyards, switching stations, and substations) are handled in "Conditions of Certification" in the **Transmission System Engineering** section of this document.

A. Final plant design plans shall include:

1. One-line diagrams for the 13.8-kV, 4.16-kV, and 480-volt systems; and
2. System grounding drawings.

B. Final plant calculations must establish:

1. Short-circuit ratings of plant equipment;
2. Ampacity of feeder cables;
3. Voltage drop in feeder cables;
4. System grounding requirements;
5. Coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8-kV, 4.16-kV, and 480-volt systems;
6. System grounding requirements; and
7. Lighting energy calculations.

C. The following activities shall be reported to BLM's Authorized Officer and the CPM in the monthly compliance report:

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

Verification: At least 30 days (or within a project owner- and CBO-approved alternative time frame) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for design review and approval the above-listed documents. The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS and shall send BLM's Authorized Officer and the CPM a copy of the transmittal letter in the next monthly compliance report.

REFERENCES

BSE 2007a – Bright Source Energy/ Solar Partners I, LLC/ J. Woolard (tn: 42174). Application for Certification, Volumes I and II, for the Ivanpah Solar Electric Generating System. Submitted to CEC/Docket Unit on 8/31/2007.

CH2ML2008g – CH2ML HILL/ J. Carrier (tn: 46239). Data Responses Set 1D. Dated on 5/09/2008. Submitted to CEC / Docket Unit on 5/09/2008.

CH2ML2009f – CH2M Hill/J. Carrier (tn: 51597). Data Responses Set 2I. Dated 05/18/2009.

Appendix C-2
Power Plant Efficiency

POWER PLANT EFFICIENCY

Prepared by Shahab Khoshmashrab and Steve Baker

SUMMARY OF CONCLUSIONS

The Ivanpah Solar Electric Generating System (ISEGS), if constructed and operated as proposed, would generate 400 megawatts (MW) (maximum net output) of electricity. This project would consist of two 100 MW plants (Ivanpah 1 and Ivanpah 2) and one 200 MW plant (Ivanpah 3), employing advanced solar power and modern steam turbine technologies. The ISEGS would use solar energy to generate up to 95 percent of its capacity, and natural gas to generate up to five percent of its capacity.

The project would decrease reliance on fossil fuel, and would increase reliance on renewable energy resources. It would not create significant adverse effects on fossil fuel energy supplies or resources, would not require additional sources of energy supply, and would not consume fossil fuel energy in a wasteful or inefficient manner. No efficiency standards apply to this project. U.S. Bureau of Land Management (BLM) and Energy Commission staff (hereafter jointly referred to as staff) therefore conclude that this project would present no significant adverse impacts on fossil fuel energy resources.

The ISEGS, if constructed and operated as proposed would occupy over nine acres per MW of power output, a figure about double that of some other solar power technologies. Employing a less land-intensive solar technology, such as the Compact Linear Fresnel Reflector technology or linear parabolic trough technology, would potentially reduce land-related impacts by approximately 50 percent. However, staff recognizes there is a wide range of environmental issues to analyze to compare the merits and impacts of one technology compared to another. This is done in more detail in the **Alternatives** section of this document. In conclusion, ISEGS would utilize solar energy potential from a site that is currently not being harnessed for power production. Thus from an efficiency perspective, ISEGS would not result in a less efficient utilization of the site's solar energy potential than is occurring currently.

Conditions of Certification referred to herein serve the purpose of both the Energy Commission's Conditions of Certification for purposes of the California Environmental Quality Act (CEQA) and BLM's Mitigation Measures for purposes of the National Environmental Policy Act (NEPA).

INTRODUCTION

FOSSIL FUEL USE EFFICIENCY

One of the responsibilities of the California Energy Commission (Energy Commission) is to make findings on whether the energy use by a power plant, including the proposed ISEGS power plant, would result in significant adverse impacts on the environment, as

defined in CEQA. If the Energy Commission finds that the ISEGS' energy consumption creates a significant adverse impact, it must further determine if feasible mitigation measures could eliminate or minimize that impact. In this analysis, staff addresses the inefficient and unnecessary consumption of energy. Power plant efficiency is not normally considered under NEPA.

In order to support the Energy Commission's findings, this analysis will:

- examine whether the facility would likely present any adverse impacts upon energy resources;
- examine whether these adverse impacts are significant; and if so,
- examine whether feasible mitigation measures or alternatives could eliminate those adverse impacts or reduce them to a level of insignificance.

SOLAR LAND USE EFFICIENCY

Solar thermal power plants typically consume much less fossil fuel (usually in the form of natural gas) than other types of thermal power plants. Therefore, common measures of power plant efficiency such as those described above are less meaningful. So far as staff can determine, methods for determining the efficiency of a solar power plant have yet to be standardized; research has uncovered no meaningful attempt to quantify efficiency. The solar power industry appears to have begun discussing the issue, but a consensus is forthcoming (CEC 2008n). In the absence of accepted standards, staff proposes the following approach.

Solar thermal power plants convert the sun's energy into electricity in three basic steps:

- Mirrors and/or collectors capture the sun's rays.
- This solar energy is converted into heat.
- This heat is converted into electricity, typically in a heat engine such as a steam turbine generator or a Stirling Engine-powered generator.

The effectiveness of each of these steps depends on the specific technology employed; the product of these three steps determines the power plant's overall solar efficiency. The greater the project's solar efficiency, the less land the plant must occupy to produce a given power output.

The most significant environmental impacts caused by solar power plants result from occupying large expanses of land. Even in a desert environment, disturbing and shading hundreds or thousands of acres of land can impact biological, cultural and paleontological resources, and can affect drainage, runoff and percolation of rainfall. The extent of these impacts is likely in direct proportion to the number of acres affected. For this reason, staff will evaluate the land use efficiency of proposed solar power plant projects. This efficiency will be expressed in terms of power produced, or MW per acre, and in terms of energy produced, or MW-hours per acre-year. Specifically:

- Power-based solar land use efficiency is calculated by dividing the maximum net power output in MW by the total number of acres impacted by the power plant, including roads and electrical switchyards and substations.
- Energy-based solar land use efficiency is calculated by dividing the annual net electrical energy production in MW-hours per year by the total number of acres impacted by the power plant. Since different solar technologies consume differing quantities of natural gas for morning warm-up, cloudy weather output leveling and heat transfer fluid freeze protection (and some consume no gas at all), this effect will be accounted for. Specifically, gas consumption will be backed out by reducing the plant's net energy output by the amount of energy that could have been produced by consuming the project's annual gas consumption in a modern combined cycle power plant. (See **EFFICIENCY Appendix A**, immediately following.) This reduced energy output will then be divided by acres impacted.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

No federal, state, or local/county laws, ordinances, regulations, and standards (LORS) apply to the efficiency of this project.

SETTING

The applicant proposes to build and operate the ISEGS, a solar thermal power plant facility, comprised of Ivanpah 1, Ivanpah 2, and Ivanpah 3, producing a total of 400 MW (maximum net output), and employing BrightSource's Distributed Power Tower (DPT) advanced solar power technology (BSE 2007a, AFC §§1.1, 1.2, 2.1). Ivanpah 1 and Ivanpah 2 would each consist of a heliostat solar field, a solar receiver boiler, a reheat steam turbine generator, an air-cooled condenser, and associated equipment. Ivanpah 3 would consist of a heliostat solar field, five solar receiver boilers, a reheat steam turbine generator, a solar reheater boiler, an air-cooled condenser, and associated equipment (**CH2ML2009f**).

The project's power cycle would be based on a steam cycle (also known as the Rankine cycle) with three pressure stages. Each plant would include a small package natural gas-fired start-up boiler to provide heat for plant start-up and during temporary cloud cover. The heliostat mirrors are arranged around each solar receiver boiler. Each mirror tracks the sun throughout the day and reflects the solar energy to the receiver boiler. Steam is generated in the boilers and is expanded through the steam turbine to generate electricity. No intermediate fluid is used.

The solar field and power generation equipment are started each morning after sunrise once solar radiation builds up, and are shut down in the evening when solar radiation drops below the level required for keeping the steam turbines online. As explained above, natural gas-fired boilers would be used to bring the system up to operating temperature in the morning and periodically to keep system temperatures up when clouds briefly block sunlight. Natural gas would be delivered to the ISEGS via a new 6-

mile-long, 4- to 6-inch diameter natural gas distribution pipeline that would provide natural gas from the Kern River Gas Transmission (KRGT) line to the project (BSE 2007a, AFC §§1.2, 2.1, 2.2.6).

ASSESSMENT OF IMPACTS — FOSSIL FUEL ENERGY USE

METHOD AND THRESHOLD FOR DETERMINING THE SIGNIFICANCE OF FOSSIL FUEL ENERGY RESOURCES

CEQA guidelines state that the environmental analysis "...shall describe feasible measures which could minimize significant adverse impacts, including where relevant, inefficient and unnecessary consumption of energy" (Title 14 CCR §15126.4[a][1]). Appendix F of the guidelines further suggests consideration of such factors as the project's energy requirements and energy use efficiency; its effects on local and regional energy supplies and energy resources; its requirements for additional energy supply capacity; its compliance with existing energy standards; and any alternatives that could reduce the wasteful, inefficient, and unnecessary consumption of energy (Title 14, CCR §15000 et seq., Appendix F).

The inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas and oil, constitutes an adverse environmental impact. An adverse impact can be considered significant if it results in:

- adverse effects on local and regional energy supplies and energy resources;
- a requirement for additional energy supply capacity;
- noncompliance with existing energy standards; or
- the wasteful, inefficient, and unnecessary consumption of fuel or energy.

PROJECT ENERGY REQUIREMENTS AND ENERGY USE EFFICIENCY

The ISEGS would burn natural gas at a nominal rate of approximately 833 million British thermal units (MMBtu) per hour, LHV, during maximum load operation, for a total annual consumption of 432,432 MMBtu LHV (BSE 2007a, AFC Tables 5.1-13, 5.1-15). Compared to a typical natural gas-fired power plant of equal capacity, this rate is very low. Further, average daily operation of the natural gas boilers would be limited to one hour. Therefore, staff considers the impact of the project's fuel consumption on energy supplies and energy efficiency to be less than significant.

ADVERSE EFFECTS ON ENERGY SUPPLIES AND RESOURCES

The applicant has described its sources of natural gas for the project (BSE 2007a, AFC §§1.2, 2.1, 2.2.6). Natural gas would be delivered to the ISEGS via a new 6-milelong, 4- to 6-inch diameter natural gas distribution pipeline that would provide natural gas from the Kern River Gas Transmission (KRGT) line to the project site. Natural gas would be used to generate only up to five percent of the project's capacity. The KRGT system is

capable of delivering the gas that the ISEGS would require; this natural gas supply constitutes a reliable source of natural gas for this project. Therefore, it appears highly unlikely that the project would create a substantial increase in natural gas demand.

ADDITIONAL ENERGY SUPPLY REQUIREMENTS

Natural gas fuel would be supplied to the project by the KRGT via a new pipeline connection (BSE 2007a, AFC §§1.2, 2.1, 2.2.6)). There appears to be little likelihood that the ISEGS would require additional supply.

COMPLIANCE WITH ENERGY STANDARDS

No standards apply to the efficiency of the ISEGS or other non-cogeneration projects.

ALTERNATIVES TO REDUCE WASTEFUL, INEFFICIENT, AND UNNECESSARY ENERGY CONSUMPTION

The ISEGS could create significant adverse impacts on energy resources if alternatives reduced the project's fuel use. The evaluation of alternatives to the project (that could reduce wasteful, inefficient, or unnecessary energy consumption) requires the examination of the project's energy consumption. Even though staff does not believe the project's fuel consumption would be significant, staff evaluates alternatives that could reduce or eliminate the use of natural gas.

Efficiency of Alternatives to the Project

The Ivanpah SEGS' objectives include the generation of electricity using BrightSource's DPT solar power technology (BSE, 2007a, AFC §6.6).

Alternative Generating Technologies

Alternative generating technologies for the ISEGS are considered in the AFC (BSE 2007a, AFC §6.6). For purposes of this analysis, natural gas, oil, coal, nuclear, biomass, hydroelectric, and wind technologies are all considered. Given the project objectives, location, air pollution control requirements, and the commercial availability of the above technologies, staff agrees with the applicant that the selected solar thermal technology is a feasible selection.

Alternative Heat Rejection System

The applicant proposes to employ a dry cooling system (air-cooled condensers) as the means for rejecting power cycle heat from the steam turbines (BSE 2007a, AFC §§1.2, 2.1). An alternative heat rejection system would utilize evaporative cooling towers.

The local climate in the project area is characterized by high temperatures and low relative humidity (low wet-bulb temperature). In low temperatures and high relative humidity (low dry-bulb temperature), the air-cooled condenser performs relatively efficiently compared to the evaporative tower. However, at the project area (low wet-bulb temperature and high dry-bulb temperature) the air-cooled condenser performance is relatively poor compared to that of an evaporative cooling tower. Furthermore, the performance of the heat rejection system affects the performance of the steam turbine,

impacting turbine efficiency. However, to conserve water in the project site's desert environment, the applicant proposes to employ dry cooling. Even though evaporative cooling can offer a higher efficiency rating for this project, staff believes the applicant's selection of dry cooling is a reasonable tradeoff as it would prevent potentially significant environmental impacts that could result from consumption of the large quantities of water required by wet cooling.
Staff, therefore, believes that the ISEGS would not constitute a significant adverse impact on fossil fuel energy resources compared to feasible alternatives.

ASSESSMENT OF IMPACTS — SOLAR LAND USE

The solar insolation falling on the earth's surface can be regarded as an energy resource. Since this energy is inexhaustible, its consumption does not present the concerns inherent in fossil fuel consumption. What is of concern, however, is the extent of land area required to capture this solar energy and convert it to electricity. Setting aside hundreds or thousands of acres of land for solar power generation removes it from alternative uses. Constructing buildings, solar collector foundations and roads can disturb and destroy cultural and paleontological resources. Shading large tracts of land can destroy its use as habitat for flora and fauna. Finally, the earthwork involved in leveling large areas for optimum solar energy collection can disturb the drainage, runoff and percolation of rainfall.

As discussed above, staff is unaware of any accepted standard for evaluating the efficiency of a solar power plant such as ISEGS. Accordingly, staff proposes to tabulate the land use efficiency of the project (described above) and compare it to similar measures for other solar power plant projects that have passed through, or are passing through, the Energy Commission's siting process.

METHOD AND THRESHOLD FOR DETERMINING THE SIGNIFICANCE OF SOLAR LAND USE ENERGY RESOURCES

Staff proposes to compare the land use of a solar power plant project to that of other solar projects in the Energy Commission's siting process. It has not been determined how great a difference in land use would constitute a significant difference; staff proposes to compare the five solar projects currently in the process.

As this is written, there are currently five solar power plant projects in the Energy Commission siting process. These projects' power and energy output, and the extent of the land occupied by them, are summarized in **EFFICIENCY Table 1**, below. The solar land use efficiency for a typical natural gas-fired combined cycle power plant is shown only for comparison.

Adverse Effects on Land Use

While the Energy Commission customarily requires full mitigation for such impacts, such mitigation is generally regarded as less effective in protecting resources than avoiding

the impact entirely. A solar power project that occupies twice as much land as another project holds the potential to produce twice the environmental impacts.

PROPOSED PROJECT – LAND USE

The ISEGS would produce power at the rate of 400 MW net, and would generate energy at the rate of 960,000 MW-hours net per year, while occupying 3,744 acres (CH2ML2008g, pp. 2-3). It would consume 432,432 MMBtu LHV of natural gas annually. Staff calculates power-based land use efficiency thus:

Power-based efficiency: 400 MW ÷ 3,744 acres = **0.11 MW/acre** or **9.4 acres/MW**

Staff calculates energy-based land use efficiency thus:

Energy-based efficiency: 960,000 MWh/year ÷ 3,744 acres = **256 MWh/acre-year**

Natural gas proxy: 432,432 MMBtu/year ÷ 3,413 Btu/kWh = 126,701 MWh/year
126,701 MWh/year x 53.7%[1] = 68,039 MWh/year
960,000 MWh/year – 68,039 MWh/year = 891,961 MWh/year

Energy-based efficiency (net of natural gas use):
891,961 MWh/year ÷ 3,744 acres = **238 MWh/acre-year**

[1] See EFFICIENCY Appendix A, immediately following

EFFICIENCY Table 1 — Solar Land Use Efficiency

Project	Generating Capacity (MW net)	Annual Energy Production (MWh net)	Annual Fuel Consumption (MMBtu LHV)	Footprint (Acres)	Land Use Efficiency (Power-Based) (MW/acre)	Land Use Efficiency (Energy – Based) (MWh/acre-year)	
						Total	Solar Only[1]
Ivanpah SEGS (07-AFC-5)	400	960,000	432,432	3,744	0.11	256	238
Carrizo Energy (07-AFC-8)	177	375,000	0	640	0.28	586	586
Beacon Solar (08-AFC-2)	250	600,000	36,000	1,321	0.19	454	450
SES Solar Two (08-AFC-5)	750	1,620,000	0	6,500	0.12	249	249
SES Solar One (08-AFC-13)	850	1,840,000	0	8,200	0.11	224	224
Avenal Energy (08-AFC-1)[2]	600	3,023,388	24,792,786	25	24.0	120,936	N/A

[1] Net energy output is reduced by natural gas-fired combined cycle proxy energy output; see **EFFICIENCY Appendix A**.

[2] Example natural gas-fired combined cycle plant.

As seen in **EFFICIENCY Table 1**, ISEGS, employing solar power tower technology, is roughly half as efficient in use of land as the Compact Linear Fresnel Reflector technology and the linear parabolic trough technology. The Stirling Energy Systems Solar One and Two projects match Ivanpah SEGS in solar land use efficiency.

Proposed Project – Closure and Decommissioning and Mitigation

The closure or decommissioning of the ISEGS project would not maintain utilization of a solar renewable energy resource and could cause an increase in the reliance on fossil fuel. While this would not be the case if another solar power generation project were to follow in the place of ISEGS, this potential outcome is not assured at this time. Therefore, the closure and decommissioning of ISEGS could result in a potentially negative impact in discontinuing to utilize renewable solar resources for power production. However, this impact would not be the responsibility of the project owner to mitigate.

TECHNOLOGIES THAT WOULD REDUCE SOLAR LAND USE IMPACTS

While building and operating a natural gas-fired combined cycle power plant would yield a much higher land use efficiency than any solar power plant (see **EFFICIENCY Table 1**), it would not achieve the basic project objective, to generate electricity from the renewable energy of the sun. While building a solar power plant employing a different technology, such as the Compact Linear Fresnel Reflector technology or the linear parabolic trough technology, would appear to nearly double the solar land use efficiency of the ISEGS site or approximately halve the land use to accomplish the same generation capacity, there is a wide range of environmental issues to analyze to compare the merits and impacts of one technology compared to another. This is done in more detail in the **Alternatives** section of this document.

The applicant expressed concern in its Preliminary Staff Assessment (PSA) comments that staff presented a comparative measure of land use efficiency with other representative generation technologies as shown in **EFFICIENCY Table 1.** The applicant expressed that a comparison of efficiency based solely on capacity is misleading as it ignores energy production and site-specific conditions that affect the capacity factor of a project and thus the potential energy production potential (CH2ML2009a, Page 6.3-2 and 6.3-99, Solar Land Use Efficiency).

Staff has presented the relative comparison of land use efficiency from the perspective of both capacity and annual energy production, and believes that while this is a gross indicator, it is still a telling one. Staff has also explained that so far as staff can determine, methods for determining the efficiency of a solar power plant have yet to be standardized; research has uncovered no meaningful attempt to quantify efficiency. The solar power industry appears to have begun discussing the issue, but a consensus is forthcoming. In the absence of accepted standards, staff has proposed an approach it believes is reasonable and necessary for its Efficiency analysis. ISEGS would utilize solar energy potential from a site that is currently not being harnessed for power

production. Thus from an efficiency perspective, ISEGS would not result in a less efficient utilization of the site's solar energy potential than is occurring currently.

No Project / No Action Alternative

In the No Project / No Action Alternative, the proposed action would not be undertaken. The BLM land on which the project is proposed would continue to be managed within BLM's framework of a program of multiple use and sustained yield, and the maintenance of environmental quality [43 U.S.C. 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 BLM's land use plan, including another solar 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 this project is 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. For example, there are three large solar projects proposed on BLM land in Nevada within a few miles of the Ivanpah site. In addition, there are currently 66 applications for solar projects covering 611,692 acres pending with BLM in the California Desert District.

CUMULATIVE IMPACTS

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (California Code Regulation, Title 14, section 15130). NEPA states that cumulative effects can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR §1508.7).

There is the potential for substantial future development in the Ivanpah Valley area and throughout the southern California desert region. Analysis of cumulative impacts is based on data provided in the following maps and tables (see **Cumulative Scenario** section of this document):

- Cumulative Impacts Figure 1, Regional Renewable Applications;
- Cumulative Impacts Figure 2, Regional Renewable Applications (Detail);

- Cumulative Impacts Figure 3, Ivanpah Valley Existing and Future/Foreseeable Projects;
- Cumulative Impacts Table 1, Regional Renewable Energy Projects;
- Cumulative Impacts Table 2, Existing Development in the Ivanpah Valley; and
- Cumulative Impacts Table 3, Future Foreseeable Projects in the Ivanpah Valley Area.

Nearby power plant projects include the existing gas-fired, combined cycle Big Horn Generating Station near Primm, and the foreseeable potential for four proposed power plants consisting of the 300 MW GEN-3 photovoltaic (PV) solar energy project that would be immediately east of ISEGS on 4,160 acres, the 500 MW gas-fired combined cycle Ivanpah Energy Center near Primm, and two wind energy projects on Mountain Pass.

Staff believes that the construction and operation of ISEGS would not create indirect impacts (in the form of additional fuel consumption) that would not have otherwise occurred without this project. Because the ISEGS would consume significantly less natural gas than a typical natural gas-fired power plant, it should compete favorably in the California power market and replace fossil fuel burning power plants. The project would therefore not impact the cumulative amount of natural gas consumed for power generation. ISEGS would also utilize solar energy from a site that is currently not being harnessed for power production, as would the proposed GEN-3 PV project. Thus from an efficiency perspective, ISEGS would not contribute to a cumulatively considerable impact resulting in a less efficient utilization of the site's solar energy potential than is occurring currently.

NOTEWORTHY PUBLIC BENEFITS

The ISEGS would employ an advanced solar thermal technology. Solar energy is renewable and unlimited. The project would have less than significant adverse impact on nonrenewable energy resources (natural gas). Consequently, the project would help in reducing California's dependence on fossil fuel-fired power plants.

RESPONSES TO AGENCY AND PUBLIC COMMENTS

Staff has received the following agency and public comments regarding power plant efficiency.

Comments from Jenny Wilder (letter dated January 14, 2009): Where is the demand/need for the power to be produced by this project? How much electrical power is 400 megawatts? How many homes would that serve and where are those homes/businesses located? Can that amount of electric power (which requires water and natural gas) be produced more efficiently and without destroying habitat in some other way such as at the place of demand (houses or businesses)?

Staff's Response: One of the project objectives is to assist in increasing electrical generation from renewable energy in conformance with the state's policy. 400 MW of electricity can serve approximately 320,000 homes. Approximately five percent would be produced from natural gas. The quantities of natural gas used to generate this capacity would be insignificant compared to a typical natural gas plant of 400 MW. A solar power plant uses the renewable energy of sun. For the most part (95 percent of its capacity), ISEGS would use the sun's energy. Therefore, from an energy resources perspective, ISEGS would offer one the most efficient power plant technologies available. Placing the plant near the demand center may mean placing it in populated areas, where the large open lands necessary for a solar power plant may not be available.

Comment from Basin Range and Watch (letter dated January 31, 2009): For the natural gas-fired start-up boiler- What percentage of the megawatts would be from natural gas?

Staff's Response: Approximately five percent of ISEGS annual generation would be produced from natural gas.

CONCLUSIONS AND RECOMMENDATIONS

FOSSIL FUEL ENERGY USE

The Ivanpah SEGS, if constructed and operated as proposed, would use solar energy to generate up to 95 percent of its capacity, and natural gas to generate up to five percent of its capacity. The project would decrease reliance on fossil fuel, and would increase reliance on renewable energy resources. It would not create significant adverse effects on energy supplies or resources, would not require additional sources of energy supply, and would not consume energy in a wasteful or inefficient manner. No energy standards apply to this project. Staff therefore concludes that this project would present no significant adverse impacts on energy resources.

No cumulative impacts on energy resources are likely. Facility closure would not likely present significant impacts on electric system efficiency.

LAND USE AND SOLAR RESOURCE UTILIZATION

The ISEGS, if constructed and operated as proposed, would occupy over nine acres per MW of power output, a figure about double that of some other solar power technologies. Employing a less land-intensive solar technology, such as the Compact Linear Fresnel Reflector technology or linear parabolic trough technology, would potentially reduce land-related impacts by approximately 50 percent. However, staff recognizes there is a wide range of environmental issues to analyze to compare the merits and impacts of one technology compared to another. This is done in more detail in the **Alternatives** section of this document. In conclusion, ISEGS would utilize solar energy potential from a site that is currently not being harnessed for power production. Thus from an

efficiency perspective, ISEGS would not result in a less efficient utilization of the site's solar energy potential than is occurring currently.

MITIGATION MEASURES/PROPOSED CONDITIONS OF CERTIFICATION

No conditions of certification are proposed.

REFERENCES

BSE 2007a – Bright Source Energy/ Solar Partners I, LLC/ J. Woolard (tn: 42174). Application for Certification, Volumes I and II, for the Ivanpah Solar Electric Generating System. Submitted to CEC/Docket Unit on 8/31/2007.

CH2ML2008g – CH2ML HILL/ J. Carrier (tn: 46239). Data Responses Set 1D. Submitted to CEC / Docket Unit on 5/9/2008.

CH2ML2009a – CH2M HILL / J. Carrier (tn 49839). Preliminary Staff Assessment Comments, Set 1. Dated on 01/23/2009. Submitted to CEC / J. Kessler on 01/23/2009.

CH2ML2009f – CH2M HILL / J. Carrier (tn 51597). Data Response Set 2I – Project Description and Stormwater Plans. Dated on 05/18/2009. Submitted to CEC / J. Kessler on 05/18/2009.

CEC2008n – CEC / S. Baker (tn: 47155). Record of Conversation Re: Efficiency Measurement of Solar Power Plants. Dated on 2/22/2008. Submitted to CEC / Docket Unit on 7/21/2008.

EFFICIENCY Appendix A
Solar Power Plant Efficiency Calculation
Gas-Fired Proxy

In calculating the efficiency of a solar power plant, it is desired to subtract the effect of natural gas burned for morning startup, cloudy weather augmentation and Therminol freeze protection. As a proxy, we will use an average efficiency based on several recent baseload combined cycle power plant projects in the Energy Commission siting process. Baseload combined cycles were chosen because their intended dispatch most nearly mirrors the intended dispatch of solar plants, that is, operate at full load in a position high on the dispatch authority's loading order.

The most recent such projects are:

Colusa Generating Station (06-AFC-9) Nominal 660 MW 2-on-1 Combined Cycle with GE Frame 7FA CGTs Air cooled condenser, evaporative inlet air cooling Efficiency with duct burners on: 666.3 MW @ 52.5% LHV Efficiency with duct burners off: 519.4 MW @ 55.3% LHV Efficiency (average of these two): **53.9% LHV**

San Gabriel Generating Station (07-AFC-2) Nominal 696 MW 2-on-1 Combined Cycle with Siemens 5000F CGTs Air cooled condenser, evaporative inlet air cooling Efficiency with duct burners on: 695.8 MW @ 52.1% LHV Efficiency with duct burners off: 556.9 MW @ 55.1% LHV Efficiency (average of these two): **53.6% LHV**

KRCD Community Power Plant (07-AFC-7) Nominal 565 MW 2-on-1 Combined Cycle with GE or Siemens F-class CGTs Evaporative cooling, evaporative or fogging inlet air cooling Efficiency with GE CGTs: 497 MW @ 54.6% LHV Efficiency with Siemens CGTs: 565 MW @ 56.1% LHV Efficiency (average of these two): **55.4% LHV**

Avenal Energy (08-AFC-1) Nominal 600 MW 2-on-1 Combined Cycle with GE Frame 7FA CGTs Air cooled condenser, inlet air chillers Efficiency with duct burners on: 600.0 MW @ 50.5% LHV Efficiency with duct burners off: 506.5 MW @ 53.4% LHV Efficiency (average of these two): **52.0% LHV**

Average of these four power plants: **53.7% LHV**

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Appendix C-3
Power Plant Reliability

POWER PLANT RELIABILITY

Prepared by Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

The applicant predicts an equivalent availability factor of 92 to 98 percent, which U.S. Bureau of Land Management (BLM) and California Energy Commission staff (hereafter jointly referred to as staff) believe is achievable. (The availability factor of a power plant is the percentage of time it is available to generate power; both planned and unplanned outages subtract from this availability.) Based on a review of the proposal, staff concludes that the Ivanpah Solar Electric Generating System (ISEGS) would be built and would operate in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability. Conditions of Certification referred to herein serve the purpose of both the Energy Commission's Conditions of Certification for purposes of the California Environmental Quality Act and BLM's Mitigation Measures for purposes of the National Environmental Policy Act (NEPA).

INTRODUCTION

In this analysis, staff addresses the reliability issues of the ISEGS project to determine if the power plant is likely to be built in accordance with typical industry norms for reliable power generation. Staff uses this norm as a benchmark because it ensures that the resulting project would not be likely to degrade the overall reliability of the electric system it serves (see the "Setting" subsection, below).

The scope of this power plant reliability analysis covers:

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

Staff examined the project design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliable power generation. While the applicant has predicted an equivalent availability factor of 92 to 98 percent for the ISEGS (see below), staff uses typical industry norms as the benchmark, rather than the applicant's projection, to evaluate the project's reliability.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

No federal, state, or local/county laws, ordinances, regulations, or standards (LORS) apply to the reliability of this project. Power plant reliability is not normally considered under NEPA.

SETTING

In the restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the state's control area operators, such as the California Independent System Operator (California ISO), that purchase, dispatch, and sell electric power throughout the state. Determining how the California ISO and other control area operators would ensure system reliability has been an ongoing effort. Protocols have been developed and put in place that allow sufficient reliability to be maintained under the competitive market system. "Must-run" power purchase agreements and "participating generator" agreements are two mechanisms that have been employed to ensure an adequate supply of reliable power.

In September 2005, California AB 380 (Núñez, Chapter 367, Statutes of 2005) became law. This modification to the Public Utilities Code requires the California Public Utilities Commission to consult with the California ISO to establish resource adequacy requirements for all load-serving entities (basically, publicly and privately owned utility companies). These requirements include maintaining a minimum reserve margin (extra generating capacity to serve in times of equipment failure or unexpected demand) and maintaining sufficient local generating resources to satisfy the load-serving entity's peak demand and operating reserve requirements.

In order to fulfill this mandate, the California ISO has begun to establish specific criteria for each load-serving entity under its jurisdiction. These criteria guide each load-serving entity in deciding how much generating capacity and ancillary services to build or purchase, after which the load-serving entity issues power purchase agreements to satisfy these needs. According to the applicant, the ISEGS is currently in negotiation with Southern California Edison to secure a power purchase agreement.

The California ISO's mechanisms to ensure adequate power plant reliability apparently were devised under the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. However, there has been valid cause to believe that, under free market competition, financial pressures on power plant owners to minimize capital outlays and maintenance expenditures may act to reduce the reliability of many power plants, both existing and newly constructed (McGraw-Hill 1994). It is possible that, if significant numbers of power plants were to exhibit individual reliability sufficiently lower than this historical level, the assumptions used by California ISO to ensure system reliability would prove invalid, with potentially disappointing results. Accordingly, staff has recommended that power plant owners continue to build and operate their projects to the level of reliability to which all in the industry are accustomed.

As part of its plan to provide needed reliability, the applicant proposes to operate the 400-megawatt (MW) (net power output) ISEGS, a solar thermal power plant facility, comprised of two 100-MW plants (Ivanpah 1 and Ivanpah 2) and one 200-MW plant (Ivanpah 3), employing advanced solar power technology. This project, using renewable solar energy, would provide dependable power to the grid, generally during the hours of

peak power consumption by the interconnecting utility(s) (BSE 2007a, AFC §§1.1, 1.2, 2.1, 2.2). This project would help serve the need for renewable energy in California, as 95 percent of the generated electricity would be produced by solar energy, a reliable source of energy that is available during the hot summer afternoons, when power is needed most. Small natural gas-fired boilers would be used to bring the system up to operating temperature in the morning and periodically to keep system temperatures up when clouds briefly block the sunlight. These boilers are expected to be in use to produce only 5 percent of the average annual energy.

The project is expected to achieve an equivalent availability factor in the range of 92 to 98 percent (BSE 2007a, AFC §2.3.2.1). The project is anticipated to normally operate at high average annual capacity factors during periods of sunlight (BSE 2007a, AFC §2.3.21).

ASSESSMENT OF IMPACTS

METHOD FOR DETERMINING RELIABILITY

The Energy Commission must make findings as to how a project is designed, sited, and operated in order to ensure its safe and reliable operation (Title 20, CCR §1752[c]). Staff takes the approach that a project is acceptable if it does not degrade the reliability of the utility system to which it is connected. This is likely the case if a project is at least as reliable as other power plants on that system.

The availability factor of a power plant is the percentage of time it is available to generate power; both planned and unplanned outages subtract from this availability. Measures of power plant reliability are based upon both the plant's actual ability to generate power when it is considered to be available and upon starting failures and unplanned (or forced) outages. For practical purposes, reliability can be considered a combination of these two industry measures, making a reliable power plant one that is available when called upon to operate. Throughout its intended 50-year life, the ISEGS is expected to operate reliably. Power plant systems must be able to operate for extended periods without shutting down for maintenance or repairs. Achieving this reliability requires adequate levels of equipment availability, plant maintainability with scheduled maintenance outages, fuel and water availability, and resistance to natural hazards. Staff examines these factors for a project and compares them to industry norms. If the factors compare favorably for this project, staff will then conclude that the ISEGS would be as reliable as other power plants on the electric system and would not degrade system reliability.

PROPOSED PROJECT

Equipment Availability

Equipment availability would be ensured by adoption of appropriate quality assurance/quality control (QA/QC) programs during the design, procurement, construction, and operation of the plant and by providing for the adequate maintenance and repair of the equipment and systems discussed below.

Quality Control Program

The applicant describes a QA/QC program (BSE 2007a, AFC §2.3.2.5) that is typical of the power industry. Equipment would be purchased from qualified suppliers based on technical and commercial evaluations. Suppliers' personnel, production capability, past performance, QA programs, and quality history would be evaluated. The project owner would perform receipt inspections, test components, and administer independent testing contracts. Staff expects that implementation of this program would result in standard reliability of design and construction. To ensure this implementation, staff has proposed appropriate conditions of certification in the section of this document entitled **Facility Design**.

Plant Maintainability

Equipment Redundancy

The project, as proposed in the AFC, would be able to operate only when the sun is shining. Maintenance or repairs could be done when the plant is shut down at night. This would help to enhance the project's reliability. Also, the applicant proposes to provide redundant pieces of equipment for those that are most likely to require service or repair. This redundancy would allow service or repair to be done during sunny days when the plant is in operation, if required.

The applicant plans to provide an appropriate redundancy of function for the project (BSE 2007a, AFC §2.3.2.2, Table 2.3-1). Because the project consists of three independent steam turbine generators, it is inherently reliable. A single equipment failure could not disable more than one plant, which would allow the other two plants to continue to generate at their full output. All other major plant systems are also designed with adequate redundancy to ensure their continued operation if equipment fails. Staff believes that this project's proposed equipment redundancy would be sufficient for its reliable operation.

Maintenance Program

Equipment manufacturers provide maintenance recommendations for their products, and the applicant is expected to base the project's maintenance program on those recommendations. The program would encompass both preventive and predictive maintenance techniques. Maintenance outages would probably be planned for periods of low electricity demand. Staff expects that the project would be adequately maintained to ensure an acceptable level of reliability.

Fuel and Water Availability

The long-term availability of fuel and of water for cooling or process use is necessary to ensure the reliability of any power plant. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant could be curtailed, threatening both the power supply and the economic viability of the plant.

Fuel Availability

Natural gas would be delivered to the project site through a new 6-mile, 4- to 6-inch diameter gas pipeline connected to the existing Kern River Gas Transmission Pipeline owned by Kern River Gas Transmission Company (KRGT). The natural gas service would be provided to ISEGS by Southwest Gas Company. The ISEGS would connect to the KRGT pipeline 0.5 miles north of Ivanpah 3 (BSE 2007a, AFC §§1.2, 4.1). The KRGT pipeline system is a vital artery bringing natural gas into Utah, Nevada, and California. This system extends from the oil and gas producing fields of southwestern Wyoming through Utah and Nevada to the San Joaquin Valley near Bakersfield, California. According to KRGT, the pipeline currently has a design capacity of more than 1.7 billion cubic feet per day (KRGT 2007). The ISEGS would be a solar thermal power plant and the use of natural gas would be limited to unit warm up and brief periods of cloud cover. The use of natural gas is not anticipated to exceed 4 hours per day maximum and an average of 1 hour per day on average, and would not contribute to more than 5 percent of the average annual energy. The very limited use of fuel would have minimal impact on gas supplies. Staff believes that there will be adequate natural gas supply and pipeline capacity to meet the project's needs.

Water Supply Reliability

The ISEGS would use well water for domestic and industrial water needs. Two 100-percent capacity wells would be located at the northwest corner of Ivanpah 1, just outside the perimeter fence but within the construction logistics area and would supply water to all three plants. The wells would be connected to the project via a 570-foot water line to Ivanpah 2, from which the line would be extended to each plant (BSE 2007a, AFC §§1.2, 2.1, 2.2.7, 2.3.2.4). To minimize process water use associated with cooling, air-cooled condensers would be used. Package treatment plants would be used to provide potable water for drinking and sanitary uses. Staff believes these sources represent a reliable supply of water for the project. For further discussion of water supply, see the **Soil and Water Resources** section of this document.

Power Plant Reliability In Relation To Natural Hazards

Natural forces can threaten the reliable operation of a power plant. High winds, tsunamis (tidal waves), and seiches (waves in inland bodies of water) are not likely to present hazards for this project, but seismic shaking (earthquakes) and flooding could present credible threats to the project's reliable operation.

Seismic Shaking

The site lies within Seismic Zone 3 (BSE 2007a, AFC §2.3.1.1.1); see the "Faulting and Seismicity" portion of the **Geology, Paleontology & Minerals** section of this document. The project will be designed and constructed to the latest appropriate LORS (BSE 2007a, AFC Appendix 2). Compliance with current seismic design LORS represents an upgrading of performance during seismic shaking compared to older facilities since these LORS have been continually upgraded. Because it would be built to the latest seismic design LORS, this project would likely perform at least as well as, and perhaps better than, existing plants in the electric power system. Staff has proposed conditions of certification to ensure this; see the section of this document entitled **Facility Design**. In light of the general historical performance of California power plants and the electrical system in seismic events, staff has no special concerns with the power plant's functional reliability during seismic events.

Flooding

The project site elevation is approximately 2,765 feet above mean sea level (BSE 2007a, AFC §5.8.3.1). According to the Federal Emergency Management Agency, the site is not within either the 100- or 500-year flood plain (BSE 2007a, AFC §§2.3.1.1.1, 5.15.3.1.3). Staff believes there are no special concerns with power plant functional reliability due to flooding. For further discussion, see **Soil and Water Resources** and **Geology, Paleontology & Minerals**.

Comparison with Existing Facilities

The North American Electric Reliability Corporation (NERC) maintains industry statistics for availability factors (as well as other related reliability data). The NERC regularly polls North American utility companies on their project reliability through its Generating Availability Data System and periodically summarizes and publishes those statistics on the Internet <http://www.nerc.com>. Because solar technology is relatively new, no statistics are available for solar power plants. The project's power cycle is based on steam cycle. Because natural gas is the primary type of fossil fuel used in California, staff finds it reasonable to compare the project's availability factor to the average availability factor of natural gas-fired fossil fuel units. Also, because the project's total net power output would be 400 MW, staff uses the NERC statistics for 400–599 MW units. The NERC reported an availability factor of 85.07 percent as the generating unit average for the years 2002 through 2006 for natural gas units of 400–599 MW (NERC 2007).

The project would use triple-pressure, condensing steam turbine technology. Steam turbines incorporating this technology have been on the market for many years now and are expected to exhibit typically high availability. Also, because solar-generated steam is cleaner than burnt fossil fuel (i.e., natural gas), the ISEGS steam cycle units would likely require less frequent maintenance than units that burn fossil fuel. Therefore, the applicant's expectation of an annual availability factor of 92 to 98 percent (BSE 2007a, AFC §2.3.2.1) appears reasonable when compared with the NERC figures throughout North America (see above). In fact, these machines can well be expected to outperform the fleet of various turbines (mostly older and smaller) that make up NERC statistics.

Additionally, because the plant would consist of three independent steam turbine generators, maintenance could be scheduled during times of the year when the full power output is not required to meet market demand, which is typical of industry standard maintenance procedures. The applicant's estimate of plant availability, therefore, appears to be realistic. Stated procedures for assuring the design, procurement, and construction of a reliable power plant appear to be consistent with industry norms, and staff believes they are likely to ultimately produce an adequately reliable plant.

CLOSURE AND DECOMMISSIONING AND MITIGATION

The closure or decommissioning of the ISEGS project would not maintain utilization of a solar renewable energy resource and could cause an increase in the reliance on fossil fuel. While this would not be the case if another solar power generation project were to follow in the place of ISEGS, this potential outcome is not assured at this time.

Therefore, the closure and decommissioning of ISEGS could result in a potentially negative impact in discontinuing to utilize renewable solar resources for power production compared to when ISEGS would be operating. However, this impact would not be the responsibility of the project owner to mitigate.

NO PROJECT / NO ACTION ALTERNATIVE

In the No Project / No Action Alternative, the proposed action would not be undertaken. The BLM land on which the project is proposed would continue to be managed within BLM's framework of a program of multiple use and sustained yield, and the maintenance of environmental quality [43 U.S.C. 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 BLM's land use plan, including another solar 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 this project is 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. For example, there are three large solar projects proposed on BLM land in Nevada within a few miles of the Ivanpah site. In addition, there are currently 66 applications for solar projects covering 611,692 acres pending with BLM in the California Desert District.

NOTEWORTHY PROJECT BENEFITS

This project would help serve the need for renewable energy in California, as 95 percent of the generated electricity would be produced by a reliable source of solar energy that is available during the hot summer afternoons, when power is needed most. Small natural gas-fired boilers would be used to bring the system up to operating temperature in the morning and periodically to keep system temperatures up when clouds briefly block the sunlight. These boilers are expected to contribute to no more than 5 percent of ISEGS' average annual energy.

CONCLUSION

The applicant predicts an equivalent availability factor of 92 to 98 percent, which staff believes is achievable. Based on a review of the proposal, staff concludes that the plant would be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability. No conditions of certification are proposed.

RESPONSES TO AGENCY AND PUBLIC COMMENTS

Staff has not received any agency or public comments regarding power plant reliability.

MITIGATION MEASURES/PROPOSED CONDITIONS OF CERTIFICATION

No conditions of certification are proposed.

REFERENCES

BSE 2007a—Bright Source Energy/ Solar Partners I, LLC/ J. Woolard (tn: 42174). Application for Certification, Volumes I and II, for the Ivanpah Solar Electric Generating System. Submitted to CEC/Docket Unit on 8/31/2007.

KRGT 2007—Kern River Gas Transmission Company. 2007. Company information at http://www.kernrivergas.com.

McGraw-Hill 1994—McGraw-Hill Energy Information Services Group. 1994. *Operational Experience in Competitive Electric Generation.* Executive Report.

NERC 2007—North American Electric Reliability Council. 2007. *2002–2006 Generating Availability Report.*

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Appendix C-4
Transmission System Engineering

TRANSMISSION SYSTEM ENGINEERING

Prepared by Sudath Arachchige and Mark Hesters

SUMMARY OF CONCLUSIONS

The proposed Ivanpah Solar Electric Generating System (ISEGS or "Project") outlet lines and termination are acceptable and would comply with all applicable laws, ordinances, regulations, and standards (LORS). The analysis of project transmission lines and equipment, both from the three power plants up to the point of interconnection with the existing transmission network as well as upgrades beyond the interconnection that are attributable to the project, have been evaluated by U.S. Bureau of Land Management (BLM) and California Energy Commission staff (hereafter jointly referred to as staff) and are included in the environmental sections of this Final Staff Assessment/Draft Environmental Impact Statement (FSA/DEIS). Staff's conclusions with respect to Transmission System Engineering result in the need for Ivanpah to provide the following mitigation measures:

- Mitigation of base case thermal overloads caused by Ivanpah #1 and #2 power plants, would require the replacement of the existing 115/220 kV transformer bank at the Eldorado substation and the upgrade from 115 to 220 kV of a 36 mile long segment of Eldorado-Baker-Cool Water-Dunn Siding-Mountain Pass transmission line between the new Ivanpah and existing Eldorado Substations. Ivanpah #3 would require the addition of a 115/220 kV transformer at the new Ivanpah substation.
- Mitigation of thermal overloads caused by the Ivanpah #3 under N-1 contingency analysis, would require modification of the existing Special Protection System (SPS) to reflect the topology change associated with the additional facility upgrades triggered by the Ivanpah #3 power plant.

Conditions of Certification referred to herein serve the purpose of both the Energy Commission's Conditions of Certification for purposes of the California Environmental Quality Act (CEQA) and BLM's Mitigation Measures for purposes of the National Environmental Policy Act (NEPA).

INTRODUCTION

STAFF ANALYSIS

This transmission system engineering (TSE) analysis examines whether this project's proposed interconnection conforms to all LORS required for safe and reliable electric power transmission. Additionally, under CEQA, the Energy Commission must conduct an environmental review of the "whole of the action," which may include facilities not licensed by the Energy Commission (Title 14, California Code of Regulations §15378). The BLM and California Energy Commission must therefore identify the system impacts and necessary new or modified transmission facilities downstream of the proposed

interconnection that are required for interconnection and that represent the whole of the action.

Staff relies upon the responsible interconnecting authority for analysis of impacts on the transmission grid, as well as for the identification and approval of new or modified facilities required downstream from the proposed interconnection for mitigation purposes. The proposed project would connect to SCE's 115-kV transmission network and requires both analysis by SCE and the approval of the California Independent System Operator (California ISO).

SCE'S ROLE

SCE is responsible for ensuring electric system reliability in its service territory for proposed transmission modifications. For the Ivanpah project, SCE performed the System Impact Study (SIS) used to determine whether or not the proposed transmission modifications conform to reliability standards. Because the project would be connected to the California ISO controlled transmission grid, the California ISO's role is to review and approve the SIS and its conclusions.

CALIFORNIA ISO'S ROLE

The California ISO is responsible for ensuring electric system reliability for all participating transmission owners and is also responsible for developing the standards necessary to achieve system reliability. The project power will be dispatched to the California ISO grid via SCE's newly built Ivanpah 115/220-kV substation. Therefore, California ISO will review the studies of the SCE system to ensure adequacy of the proposed transmission interconnection. The California ISO determines the reliability impacts of the proposed transmission modifications on the SCE transmission system in accordance with all applicable reliability criteria. According to the California ISO tariffs, the California ISO will determine the "need" for transmission additions or upgrades downstream from the interconnection point to insure reliability of the transmission grid. The California ISO reviewed the SIS performed by SCE and issued a preliminary approval to SCE. On completion of the SCE Facility Study, the California ISO will review the study results and provide its conclusions and recommendations. The California ISO may provide written and verbal testimony on its findings at the Energy Commission hearings.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

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

of both the public and the people who build, maintain, and operate underground electric lines.

- The *National* Electric Safety Code, 1999, provides electrical, mechanical, civil, and structural requirements for overhead electric line construction and operation.
- The combined NERC/WECC (North American Electric Reliability *Corporation*/Western Electricity Coordinating Council) planning standards provide system performance standards for assessing the reliability of the interconnected transmission system. These standards require continuity of service as their first priority and the preservation of interconnected operation as their second. Some aspects of NERC/WECC standards are either more stringent or more specific than the either agency's standards alone. These standards are designed to ensure that transmission systems can withstand both forced and maintenance outage system contingencies while operating reliably within equipment and electric system thermal, voltage, and stability limits. These standards include reliability criteria for system adequacy and security, system modeling data requirements, system protection and control, and system restoration. Analysis of the WECC system is based to a large degree on Section I.A of WECC standards, *NERC and WECC Planning Standards with Table I and WECC Disturbance-Performance Table,* and on Section I.D, *NERC and WECC Standards for Voltage Support and Reactive Power.* These standards require that power flows and stability simulations verify defined performance levels. Performance levels are defined by specifying allowable variations in thermal loading, voltage and frequency, and loss of load that may occur during various disturbances. Performance levels range from no significant adverse effects inside and outside a system area during a minor disturbance (such as the loss of load from a single transmission element) to a catastrophic loss level designed to prevent system cascading and the subsequent blackout of islanded areas and millions of consumers during a major transmission disturbance (such as the loss of multiple 500-kV lines along a common right-of- way, and/or of multiple large generators). While the controlled loss of generation or system separation is permitted under certain specific circumstances, this sort of major uncontrolled loss is not permitted (WECC, 2002).
- NERC's reliability standards for North America's electric transmission system spell out the national policies, standards, principles, and guidelines that ensure the adequacy and security of the nation's transmission system. These reliability standards provide for system performance levels under both normal and contingency conditions. While these standards are similar to the combined NERC/WECC standards, certain aspects of the combined standards are either more stringent or more specific than the NERC performance standards alone. *NERC's* reliability standards apply to both interconnected system operations and to individual service areas (NERC, 2006).
- California ISO planning standards also provide the standards and guidelines that ensure the adequacy, security, and reliability of the state's member grid facilities. These standards also incorporate the combined NERC/WECC and NERC standards. These standards are also similar to the NERC/WECC or NERC standards for transmission system contingency performance. However, the *California* ISO standards also provide additional requirements that are not found in either the

WECC/NERC or NERC standards. The California ISO standards apply to all participating transmission owners interconnecting to the California ISO- controlled grid. They also apply to non-member facilities that impact the California ISO grid through their interconnections with adjacent control grids (California ISO, 2002a).

- California ISO/FERC (Federal Energy Regulatory Commission) electricity tariffs *contain* guidelines for building all transmission additions/upgrades within the California ISO-controlled grid. (California ISO, 2003a).

PROJECT DESCRIPTION

The applicant proposes to interconnect the 400 megawatt (MW) Ivanpah to SCE's proposed newly built 220 kV Ivanpah substation near Nevada border, San Bernardino County, California. The proposed Ivanpah project would develop in three phases, two 100 MW phases known as Ivanpah #1 and #2, and one 200 MW phase known as Ivanpah #3. Construction is planned to take place over approximately 48 months, with the applicant's desire that it could begin during the first quarter of 2010 and be completed during the fourth quarter 2013. Assuming the construction of Ivanpah 1, 2 and 3 were to begin in a sequential fashion during the first quarter of 2010 and be completed during the fourth quarter of 2013, the applicant would expect to commence commercial operation in the fourth quarter for each of the power plants beginning in 2011 at Ivanpah 1, in 2012 at Ivanpah 2, and in 2013 at Ivanpah 3.

Ivanpah is a solar concentrating thermal power plant, based on distributed power tower and heliostat mirror technology. The heliostat fields focus solar energy on the power tower receivers near the center of each of the heliostat arrays. The heliostat mirrors would be asymmetrically arranged around each solar power tower. Each mirror will track the sun throughout the day and reflect the solar energy to the receiver boiler within the power tower. In each plant, one Rankine-cycle reheat steam turbine receives live steam from the solar boilers and reheat steam from one solar reheater-located in the power block at the top of its own power tower. The solar field and power generation equipment would be started each morning after sunrise and insolation build-up, and shut down in the evening when insolation drops below the level required to maintain the turbine connected. Electricity would be produced by each plant's solar receiver boiler and the steam turbine generator. Each of the three ISEGS projects would connect to its own 115 kV switchyard and from there to a proposed SCE Ivanpah 115/220 kV substation which would connect to the SCE system by looping an existing transmission line into the new substation (CH2ML2008g).

SWITCHYARD AND INTERCONNECTION FACILITIES

Each of the Project's three generating units (1, 2, and 3) would be connected to the low side of its dedicated 13.8/115 kV generator step-up (GSU) transformer through 25 kV, 7,000-ampere gas-insulated (SF6) breaker. The high side of the generator step-up transformer would be connected to the project's switchyard via 115 kV, 1200-ampere disconnect switch. The step-up transformer for the steam turbine generating unit would

be rated at 13.8/115 kV and 72/96/120 megavolt ampere (MVA). Each project switchyard bay will consist of a 115 kV, 1200A single circuit breaker and two 1200A disconnect switches. The switchyard circuit breaker would interconnect to an overhead 115kV single circuit transmission line via 1200A disconnect switch. Each of the three phases will connect to a new Ivanpah substation via its own dedicated 115 kV generator tie line. The Ivanpah #1 115 kV generator tie line would be approximately 5,800 feet long, built with 477 kcmil ACSR conductors and supported by single-pole structures. The Ivanpah #2 and #3 generator tie lines would share the same poles for the last 1,400 feet of their routes before they interconnect to SCE's Ivanpah Substation. The Ivanpah #2 generator would connect to the Ivanpah Substation through 115kV, 3,900 feet-long single circuit generator tie line built with the last 1,400 feet merged with the Ivanpah #3 generator tie line to create a 1,400 feet long, overhead double circuit line prior to entering the Ivanpah Substation. The Ivanpah #3 generator tie line would be an approximately 14,100 feet long, single circuit, 115 kV line built with 1510 kcmil ACSR and would merge into a 115kV double circuit with the Ivanpah #2 generator tie line.

SCE's Ivanpah Substation would use a double-bus breaker-and-a half configuration with 3 bays and 5 positions for outgoing transmission lines. The Ivanpah Substation would consists of 115kV, 1200A circuit breakers, 115kV disconnect switches and other switching gear that will allow delivery of the project's output to the SCE grid. The existing Eldorado-Baker-Cool Water-Dunn Siding-Mountain Pass 115kV line would loop in and out through the newly built Ivanpah Substation to interconnect the project to the SCE transmission grid. (Ivanpah #2, 2007b section 3.2.2 pages 3-4 to 3-6 and Figure 01-PB-E-D-201).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

For the interconnection of this proposed project to the grid, the interconnecting utility (SCE) and the control area operator (California ISO) are responsible for ensuring grid reliability. These two entities determine the transmission system impacts of the proposed project and any mitigation measures needed to ensure system conformance with utility reliability criteria, NERC planning standards, WECC reliability criteria, and California ISO reliability criteria. System impact and facilities studies are used to determine the impacts of the proposed project on the transmission grid. Staff relies on these studies and any review conducted by the California ISO to determine the effect of the project on the transmission grid and to identify any necessary downstream facilities or indirect project impacts required to bring the transmission network into compliance with applicable reliability standards. System impact and facilities studies analyze the grid both with and without the proposed project, under conditions specified in the planning standards and reliability criteria. The standards and criteria define the assumptions used in the study and establish the thresholds through which grid reliability is determined. The studies analyze the impact of the project for the proposed first year of operation, and are based on a forecast of loads, generation, and transmission. Load forecasts are developed by the interconnected utility. Generation and transmission forecasts are established by an interconnection queue. The studies focus on thermal overloads, voltage deviations, system stability (excessive oscillations in generators and transmission system, voltage

collapse, loss of loads, or cascading outages), and short circuit duties. If the studies show that the interconnection of the project causes the grid to be out of compliance with reliability standards, then the study will identify mitigation alternatives or ways in which the grid could be brought into compliance with reliability standards.
When a project connects to the California ISO-controlled grid, both the studies and mitigation alternatives must be reviewed and approved by the California ISO. If either the California ISO or interconnecting utility determines that the only feasible mitigation includes transmission modifications or additions requiring CEQA review, the Energy Commission must analyze those modifications or additions according to CEQA requirements.

PROPOSED PROJECT - SCOPE OF SYSTEM IMPACT STUDIES

The system impact studies were performed by SCE at the request of Bright Source Energy, Inc, to identify the transmission system impacts of Ivanpah's #1, #2 and #3 on SCE's 115/220/500-kV system. The studies included power flow, sensitivity, and short circuit studies, and transient and post-transient analyses (Ivanpah #1, #2 and #3, 2008a, System Impact Studies). The studies modeled the proposed project for a net output of 100 MW for Ivanpah #1 and #2, 200 MW for Ivanpah #3. The base cases included all California ISO approved major SCE transmission projects, the transmission system for the Los Angeles Department of Water and Power, and major path flow limits of Southern California Import Transmission, East-Of-River, and West-of-River. The studies considered light load conditions with generation patterns and Path 46 imports maximized to identify the extent of potential congestion and fully stress the SCE system in the area where the Ivanpah project phases are interconnecting. The detailed study assumptions are described in the studies. The power flow studies were conducted with and without Ivanpah phases connected to SCE's grid at the newly built Ivanpah Substation, using 2013 heavy summer and 2013 light spring base cases. The power flow study assessed the project's impact on thermal loading of the transmission lines and equipment.
Transient and post-transient studies were conducted for Ivanpah phases of the project using the 2013 heavy summer base case to determine whether the project would create instability in the system following certain selected outages. Short Circuit studies were conducted to determine if Ivanpah phases would overstress existing substation facilities.

Power Flow Study Results and mitigation measures (Ivanpah #1 and #2)

The study determined that the system between Mountain Pass and Eldorado substation is inadequate to accommodate the full output of all generation projects queued ahead of the Ivanpah #1 and #2 power plants.

Base Case Conditions (N-0):
Under base case conditions, a portion of the Eldorado-Baker-Cool Water-Dunn Siding-Mountain Pass 115 kV line as well as the existing 115/220 kV transformer at Eldorado were found to be loaded beyond the maximum allowable limits.

Mitigation:

- Removal of approximately 36 miles of a portion of the Eldorado – Ivanpah leg of the existing Eldorado-Baker-Cool Water–Dunn Siding-Mountain Pass 115 kV line and construction of a new 36 mile long, 220 kV double circuit line, with 1590 kcmil ACSR conductors. (The circuit would initially energized at 115 kV)
- Replacement of the existing 115/220 kV, 102 MVA transformer bank at the Eldorado Substation with 115/220 KV, 280 MVA bank.

Power Flow Study Results and mitigation measures (Ivanpah #3)

The study determined that the system between Ivanpah and Eldorado substation is inadequate to accommodate the full output of all generation projects queued ahead of the Ivanpah #3 power plant.

Base Case Conditions (N-0): Under the base case conditions, the study determined that the modified Eldorado 115/220 kV transformer bank is insufficient to accommodate Ivanpah #3. The existing Eldorado substation design does not provide the ability to install an additional 115/220 kV transformer bank without causing significant changes at the site. Adding a second transformer bank at the Eldorado substation is not a viable alternative.

> Mitigation: Therefore, an additional transformer bank should be installed at proposed Ivanpah substation to increase the operating voltage from 115 kV to 220 kV of the Eldorado-Ivanpah 220 kV transmission line. This will also require the construction of two new 220 kV line positions on the west side of Eldorado substation within the existing fence line.

With the additional upgrades triggered by the Ivanpah #3, the study identified the continued need for a Special Protection System (SPS) in order to mitigate thermal overloads identified under N-1 contingency analysis. The study did not identify any N-2 thermal overloads.

Single Outage Contingency (N-1): The loss of the new 36 mile Eldorado-Ivanpah 220 kV transmission line under N-1 contingency conditions would disconnect the Ivanpah and Mountain Pass areas from the Eldorado substation thereby triggering voltage collapse and thermal overload problems.

> Mitigation: To mitigate this criteria violation, a previously implemented SPS will need to be modified to reflect the changes associated with the facility upgrades triggered by the Ivanpah #3. The SPS should be capable of tripping Mountain Pass 115 kV line, the new Ivanpah substation, the new Ivanpah 220 kV transmission line and the Ivanpah #3.

Single Outage Contingency (N-1):
Loss of one Ivanpah 115/220kV transformer bank results in loading the remaining transformer bank beyond its maximum emergency capability.

Mitigation: To mitigate this criteria violation, a previously implemented SPS will need to be modified. The SPS should be capable of tripping Mountain Pass 115 kV new Ivanpah substation, New Ivanpah 220 kV transmission line or the Ivanpah #3 of the project under loss of one Ivanpah 115/220 kV transformer bank by opening the corresponding unit circuit breaker.

Transient Stability Results

Transient stability studies identified that the Ivanpah #1, #2 and #3 power plants of the project steam generators experience transient instability under 15 cycle closed in (three-phase-to-ground) system faults located at or near the proposed Ivanpah 115kV substation. To mitigate the transient stability problem, the following up grades are proposed;

- Upgrade SCE 115 kV relay protection near the proposed Ivanpah substation to provide for primary protection fault clearing time of less than 8 cycles.
- Ensure project developer installs out-of step protection on the Ivanpah #1, #2 and #3 steam turbine-generators.

Post-Transient Stability Results

Depending on the amount of generation resource on line, loss of either Eldorado-Ivanpah transmission line or loss of the 115/220 kV transformer at Eldorado resulted in a significant voltage deviation including a voltage collapse, in the Dunn Siding and Baker substation areas. To mitigate this problem, the following reliability upgrades are proposed.

- Install a Special Protection System (SPS) that trips the Ivanpah #1, #2 and #3 projects under outages of transmission facilities connecting the proposed Ivanpah substation to the Eldorado substation (transmission line and transformer bank at Eldorado substation).

Short-Circuit Duty Study Results

Short circuit studies were performed to determine the degree to which the addition of Ivanpah project increases fault duties at SCE substations, and other 115 kV, 220 kV, and 220 kV busses within the study area. The busses at which faults were simulated, the maximum three-phase and single-line-to-ground fault currents at these busses both with and without the project, and information on the breaker duties at each location are summarized in the Short Circuit Study results tables of the System Impact Study Report (Ivanpah #3, 2008b, SIS, tables 2-3, Pages 38 and 39).

The results of the three-phase-to-ground and single-phase-to-ground short-circuit duty studies identified that three 220kV 50kA circuit breakers at the Lugo Substation will need to be replaced and that two 220 kV 50kA circuit breakers also at the Lugo Substation will need to be upgraded to 63 kA rating by installing Transient Recovery Voltage (TRV) capacitor banks. Additionally, the Eldorado 220 kV substation will needed to be upgraded to 80 kA design standard as the current 63 KA capability was identified to be exceeded by a queued ahead generation projects. The breaker upgrades would occur within the fence line of existing substations and would not trigger CEQA review. Detailed Short Circuit study results will be provided as a part of the Facilities Study.

Closure and Decommissioning Impacts and Mitigation

Closure and decommissioning activities associated with Ivanpah would involve the removal of the three power plants (Ivanpah # 1, 2 and 3), their switchyards and generation tie lines from the respective switchyards to the Ivanpah Substation. Ivanpah Substation would not be affected, and thus the integrity of the Eldorado-Baker-Cool Water-Dunn Siding-Mountain Pass transmission line would not be affected. Therefore, there would not be any significant adverse environmental effects or LORS conformance issues associated with the Ivanpah closure and decommissioning.

NO PROJECT/NO ACTION ALTERNATIVE

In the No Project / No Action Alternative, the proposed action would not be undertaken. The BLM land on which the project is proposed would continue to be managed within BLM's framework of a program of multiple use and sustained yield, and the maintenance of environmental quality [43 U.S.C. 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 BLM's land use plan, including another solar 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 this project is 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. For example, there are three large solar projects proposed on BLM land in Nevada within a few miles of the Ivanpah site. In addition, there are currently 66 applications for solar projects covering 611,692 acres pending with BLM in the California Desert District.

CUMULATIVE IMPACTS AND MITIGATION

Staff has reviewed the lists of existing and foreseeable projects as presented in the **Cumulative Scenario** section of this FSA/DEIS. Staff's review considers whether the interconnection of Ivanpah to SCE's transmission system along with other existing and foreseeable generation projects would conform to all LORS required for safe and reliable electric power transmission. The analysis described above under the heading Proposed Project – Scope of System Impact Studies is conducted in coordination with, and the approval of, California ISO to consider existing and proposed generator interconnections to the transmission grid and their potential safety and reliability impacts under a number of conservative contingency conditions. The results of this study conclude that with implementation of the mitigation measures recommended by staff and required by California ISO as a condition of Ivanpah interconnection, Ivanpah will not contribute to a cumulative impact to the safety and reliability of the transmission system.

COMPLIANCE WITH LORS

The studies indicate that the three phases of the project would comply with NERC/WECC planning standards and California ISO reliability criteria. The applicant will design and fund construction of the proposed 220 kV Ivanpah substation and a new 36-mile long segment of Eldorado-Baker-Cool Water-Dunn Siding-Mountain Pass transmission line between Eldorado and Ivanpah Substations. Staff concludes that, assuming the proposed conditions of certification are met, the project would likely meet the requirements and standards of all applicable LORS.

NOTEWORTHY PUBLIC BENEFITS

Staff has not identified any noteworthy public benefits associated with Transmission System Engineering.

RESPONSE TO AGENCY AND PUBLIC COMMENTS ON THE PSA

No agency or public comments related to the TSE discipline have been received.

CONCLUSIONS AND RECOMMENDATIONS

The proposed Ivanpah outlet lines and termination are acceptable and would comply with all applicable laws, ordinances, regulations, and standards (LORS). The analysis of project transmission lines and equipment, both from the power plant up to the point of interconnection with the existing transmission network as well as upgrades beyond the interconnection that are attributable to the project have been evaluated by staff and are included in the environmental sections of this staff assessment. Staff's conclusions with respect to Transmission System Engineering result in the need for Ivanpah to provide the following mitigation measures:

- Mitigation of base case thermal overloads caused by Ivanpah #1 and Ivanpah #2 of the project, would require the replacement of the existing 115/220 kV transformer

bank at the Eldorado substation and the upgrade of a 36 mile long segment of Eldorado-Baker-Cool Water-Dunn Siding-Mountain Pass transmission line between Eldorado and Ivanpah Substations. Ivanpah #3 would require the addition of a 115/220 kV transformer at the new Ivanpah substation.

- Mitigation of thermal overloads caused by the Ivanpah #3 under N-1 contingency analysis, would require modification of the existing Special Protection System (SPS) to reflect the topology change associated with the additional facility upgrades triggered by the Ivanpah #3 power plant.

MITIGATION MEASURES/PROPOSED CONDITIONS OF CERTIFICATION

If BLM grants a Right-of-Way and the Energy Commission approves this project, staff recommends that the following conditions of certification be met to ensure both system reliability and conformance with LORS.

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

Verification: At least 60 days prior to the start of construction (or a lesser number of days mutually agreed to by the project owner and the CBO), the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO, BLM's Authorized Officer and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in **Table 1: Major Equipment List** below). Additions and deletions shall be made to the table only with CPM, BLM's Authorized Officer and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

TRANSMISSION SYSTEM ENGINEERING Table 1
Major Equipment List

Breakers
Step-Up Transformer
Switchyard
Busses
Surge Arrestors
Disconnects
Take Off Facilities
Electrical Control Building
Switchyard Control Building
Transmission Pole/Tower
Grounding System

TSE-2 Prior to the start of construction, the project owner shall assign an electrical engineer and at least one of each of the following to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; or D) a mechanical engineer. (Business and Professions Code Sections 6704 et seq. require state registration to practice as a civil engineer or structural engineer in California.

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

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

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

Verification: At least 30 days prior to the start of rough grading (or a lesser number of days mutually agreed to by the project owner and the CBO), the project owner shall submit to the CBO for review and approval, the names, qualifications, and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify BLM's authorized officer and the CPM of the CBO's approvals of the engineers within five days of the approval.

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

TSE-3 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend corrective action (California Building Code, 1998, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance). The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval and shall reference this condition of certification.

Verification: The project owner shall submit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to BLM's Authorized Officer and the CPM within 15 days of receipt. If disapproved, the project owner shall advise BLM's Authorized Officer and the CPM, within five days, the reason for disapproval, and the revised corrective action required obtaining the CBO's approval.

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

1. Receipt or delay of major electrical equipment;
2. Testing or energization of major electrical equipment; and
3. The number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: At least 30 days prior to the start of each increment of construction (or a lesser number of days mutually agreed to by the project owner and the CBO), the project owner shall submit to the CBO for review and approval the final design plans, specifications, and calculations for equipment and systems of the power plant switchyard, outlet line, and termination, including a copy of the signed and stamped statement from the responsible electrical engineer attesting to compliance with the applicable LORS, and send BLM's Authorized Officer and the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

TSE-5 The project owner shall ensure that the design, construction, and operation of the proposed transmission facilities will conform to all applicable LORS, including the requirements listed below. The project owner shall submit the required number of copies of the design drawings and calculations as determined by the CBO.

1. The Ivanpah 1 will be interconnected to the SCE grid via a segment of 115kV, 477 kcmil-ACSR, approximately 5,800 feet long single circuit.

   The Ivanpah #2 will be interconnected to the SCE grid via a segment of 115-kV, 477 kcmil-ACSR, approximately 3900 feet long single circuit and a segment of 115kV, 477- kcmil, approximately 1400 feet long double circuit generator tie-line.

   The Ivanpah #3 generator tie line would be approximately 14,100 feet long, single circuit, 115kV line built with 1510 kcmil ACSR and would merge into a 115kV double circuit with the Ivanpah #2 generator tie line.

   The proposed Ivanpah substation would use a double bus breaker- and-a half configuration with 3-bays and 5 positions.

2. The power plant outlet line shall meet or exceed the electrical, mechanical, civil, and structural requirements of CPUC General Order 95 and General Order 98 or National Electric Safety Code (NESC), Title 8 of the California Code and Regulations (Title 8), Articles 35, 36, and 37 of the "High Voltage Electric Safety Orders", California ISO standards, National Electric Code (NEC), and related industry standards.

3. Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.
4. Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner's standards.
5. The project conductors shall be sized to accommodate the full output from the project.

6. Termination facilities shall comply with applicable SCE interconnection standards.
7. The project owner shall provide to BLM's Authorized Officer and the CPM:
   a. The final Detailed Facility Study (DFS) including a description of facility upgrades, operational mitigation measures, and/or Special Protection System (SPS) sequencing and timing if applicable,
   b. Executed project owner and California ISO Facility Interconnection Agreement.

Verification: At least 60 days prior to the start of construction of transmission facilities (or a lessor number of days mutually agree to by the project owner and CBO), the project owner shall submit to the CBO for approval:

1. Design drawings, specifications, and calculations conforming with CPUC General Order 95 and General Order 98 or NESC; Title 8, California Code of Regulations, Articles 35, 36, and 37 of the "High Voltage Electric Safety Orders"; NEC; applicable interconnection standards, and related industry standards for the poles/towers, foundations, anchor bolts, conductors, grounding systems, and major switchyard equipment.
2. For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on "worst-case conditions,"[1] and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or NESC; Title 8, California Code of Regulations, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders"; NEC; applicable interconnection standards, and related industry standards.
3. Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements **TSE-5** 1) through 5) above.
4. The final Detailed Facility Study, including a description of facility upgrades, operational mitigation measures, and/or SPS sequencing and timing if applicable, shall be provided concurrently to BLM's Authorized Officer and the CPM.

TSE-6 The project owner shall provide the following Notice to the California Independent System Operator (California ISO) prior to synchronizing the facility with the California transmission system:

1. At least one week prior to synchronizing the facility with the grid for testing, provide the California ISO a letter stating the proposed date of synchronization; and

[1] Worst-case conditions for the foundations would include for instance, a dead-end or angle pole.

2. At least one business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the California ISO Outage Coordination Department.

Verification: The project owner shall provide copies of the California ISO letter to BLM's Authorized Officer and the CPM when it is sent to the California ISO one week prior to initial synchronization with the grid. A report of the conversation with the California ISO shall be provided electronically to BLM's Authorized Officer and the CPM one day before synchronizing the facility with the California transmission system for the first time.

TSE-7 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent BLM authorized officer, CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC; Title 8, CCR, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders"; applicable interconnection standards; NEC; and related industry standards. In case of non-conformance, the project owner shall inform BLM's Authorized Officer, the CPM and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to BLM's Authorized Officer, the CPM and CBO:

1. "As built" engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC; Title 8, California Code of Regulations, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders"; applicable interconnection standards; NEC; and related industry standards, and these conditions shall be provided concurrently.
2. An "as built" engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. "As built" drawings of the electrical, mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for BLM's Authorized Officer or CPM audit as set forth in the "Compliance Monitoring Plan."
3. A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in charge

REFERENCES

California ISO (California Independent System Operator). 1998a. Cal-ISO Tariff Scheduling Protocol. Posted April 1998, Amendments 1,4,5,6, and 7 incorporated.

California ISO (California Independent System Operator). 1998b. Cal-ISO Dispatch Protocol. Posted April 1998.

California ISO (California Independent System Operator). 2002a. Cal-ISO Grid Planning Standards. February 2002.

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Ivanpah #1 and 2 (Ivanpah Solar Energy Generating Station 1 and 2). 2008a. Bright Source Energy, Inc. DPT1 and DPT2 project (System Impact Study) submitted to the California Energy Commission.

Ivanpah #3 (Ivanpah Solar Energy Generating Station #3). 2008a. Bright Source Energy, Inc. DPT3 project (System Impact Study) submitted to the California Energy Commission.

Ivanpah (Ivanpah Solar Energy Generating Station 1, 2 and 3). 2007b, Ivanpah Solar Power, Application for Certification. Submitted to the California Energy Commission.

NERC/WECC (North American Reliability Council/Western Electricity Coordinating Council). 2002. NERC/WECC Planning Standards. August 2002.

DEFINITION OF TERMS

AAC - All aluminum conductor

ACSR - Aluminum conductor steel-reinforced

ACSS - Aluminum conductor steel-supported

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

Ampere - The unit of current flowing in a conductor.

Bundled - Two wires, 18 inches apart.

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

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

Congestion management – A scheduling protocol, which provides that dispatched generation and transmission loading (imports) will not violate criteria.

Emergency overload – See "Single Contingency." This is also called an L-1.

Kcmil or KCM – Thousand circular mil. A unit of the conductor's cross sectional area When divided by 1,273, the area in square inches is obtained.

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

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

Megavar - One megavolt ampere reactive.

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

Megavolt ampere (MVA) – A unit of apparent power. It equals the product of the line voltage in kilovolts, current in amperes, and the square root of 3, divided by 1,000.

Megawatt (MW) – A unit of power equivalent to 1,341 horsepower.

Normal operation/normal overload – The condition arrived at when all customers receive the power they are entitled to, without interruption and at steady voltage, and with no element of the transmission system loaded beyond its continuous rating.

N-1 condition – See "single contingency."

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

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

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

Remedial action scheme (RAS) – An automatic control provision, which, for instance, will trip a selected generating unit upon a circuit overload.

SF6 (sulfur hexafluoride) – An insulating medium.

Single contingency – Also known as "emergency" or "N-1 condition," the occurrence when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service.

Solid dielectric cable – Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.

Switchyard - An integral part of a power plant and used as an outlet for one or more electric generators.

Thermal rating – See "ampacity."

TSE - Transmission system engineering.

Tap - A transmission configuration creating an interconnection through a sort single circuit to a small or medium sized load or a generator. The new single circuit line is inserted into an existing circuit by utilizing breakers at existing terminals of the circuit, rather than installing breakers at the interconnection in a new switchyard.

Undercrossing – A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.

Underbuild - A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

Appendix C-5
Energy Commission General Conditions

GENERAL CONDITIONS INCLUDING COMPLIANCE MONITORING AND CLOSURE PLAN

Prepared by Steve Munro

INTRODUCTION

The project's General Compliance Conditions of Certification, including Compliance Monitoring and Closure Plan (Compliance Plan) have been established as required by Public Resources Code section 25532. The plan provides a means for assuring that the facility is constructed, operated, and closed in compliance with public health and safety, environmental, and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission and specified in the written decision on the Application for Certification or otherwise required by law. The Compliance Plan will be integrated with a U.S. Bureau of Land Management (BLM) Compliance Monitoring Plan (hereafter referred to as the Compliance Plan) to assure compliance with the terms and conditions of any approved Right-of-Way (ROW) grant including the approved Plan of Development (POD)

The Compliance Plan is composed of elements that:

- set forth the duties and responsibilities of BLM's Authorized Officer, the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
- set forth the requirements for handling confidential records and maintaining the compliance record;
- state procedures for settling disputes and making post-certification changes;
- state procedures for requesting and approving ROW Grant or POD changes;
- state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all BLM and Energy Commission approved conditions of certification/mitigation measures;
- establish requirements for modifications or amendments to facility Closure, Revegetation, and Restoration Plans; and
- specify conditions of certification for each technical area containing the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure below a level of significance. Each specific condition of certification also includes a verification provision that describes the method of assuring that the condition has been satisfied.

Conditions of Certification referred to herein serve the purpose of both the Energy Commission's Conditions of Certification for purposes of the California Environmental Quality Act (CEQA) and BLM's Mitigation Measures for purposes of the National Environmental Policy Act (NEPA).

DEFINITIONS

The following terms and definitions are used to establish when Conditions of Certification are implemented.

BLM AUTHORIZED OFFICER:

The BLM Authorized Officer for the Project is the BLM Needles Field Manager or his designated Compliance Inspector that is responsible for oversight and inspection of all construction and operational related activities on public land.

PRE-CONSTRUCTION SITE MOBILIZATION

Site mobilization is limited preconstruction activities at the site to allow for the installation of fencing, construction trailers, construction trailer utilities, and construction trailer parking at the site. Limited ground disturbance, grading, and trenching associated with the above mentioned pre-construction activities is considered part of site mobilization. Walking, driving or parking a passenger vehicle, pickup truck and light vehicles is allowable during site mobilization.

CONSTRUCTION

Onsite work to install permanent equipment or structures for any facility.

Ground Disturbance

Construction-related ground disturbance refers to activities that result in the removal of top soil or vegetation at the site beyond site mobilization needs, and for access roads and linear facilities.

Grading, Boring, and Trenching

Construction-related grading, boring, and trenching refers to activities that result in subsurface soil work at the site and for access roads and linear facilities, e.g., alteration of the topographical features such as leveling, removal of hills or high spots, moving of soil from one area to another, and removal of soil.

Notwithstanding the definitions of ground disturbance, grading, boring and trenching above, construction does **not** include the following:

1. the installation of environmental monitoring equipment;
2. a soil or geological investigation;
3. a topographical survey;
4. any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility; and
5. any work to provide access to the site for any of the purposes specified in "Construction" 1, 2, 3, or 4 above.

START OF COMMERCIAL OPERATION

For compliance monitoring purposes, "commercial operation" begins after the completion of start-up and commissioning, when each of the power plants has reached reliable steady-state production of electricity at the rated capacity. At the start of commercial operation, plant control is usually transferred from the construction manager to the plant operations manager.

BLM'S AUTHORIZED OFFICER AND COMPLIANCE PROJECT MANAGER RESPONSIBILITIES

BLM's Authorized Officer and the Compliance Project Manager (CPM) shall oversee the compliance monitoring and is responsible for:

1. Ensuring that the design, construction, operation, and closure of the project facilities are in compliance with the terms and conditions of BLM's ROW Grant and the Energy Commission Decision

2. Resolving complaints

3. Processing post-certification changes to the conditions of certification, project description (petition to amend), and ownership or operational control (petition for change of ownership) (See instructions for filing petitions)

4. Documenting and tracking compliance filings

5. Ensuring that compliance files are maintained and accessible

BLM's Authorized Officer is the contact person for BLM and will consult with appropriate responsible agencies, Energy Commission, and Energy Commission staff when handling disputes, complaints, and amendments. The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies, BLM, Energy Commission, and Energy Commission staff when handling disputes, complaints, and amendments.

All project compliance submittals are submitted to BLM's Authorized Officer and the CPM for processing. Where a submittal required by a condition of certification requires BLM's Authorized Officer and/or CPM approval, the approval will involve all appropriate BLM personnel, Energy Commission staff and management. All submittals must include searchable electronic versions (pdf or word files).

CHIEF BUILDING OFFICIAL RESPONSIBILITIES

The Chief Building Official (CBO) shall serve as BLM's and the Energy Commission's delegate to assure the project is designed and constructed in accordance with BLM's Right-of-Way Grant, the Energy Commission's Decision including Conditions of Certification, California Building Standards Code, local building codes and applicable laws, ordinances, regulations and standards to ensure health and safety. The CBO is

typically made-up of a team of specialists covering civil, structural, mechanical and electrical disciplines whose duties include the following:

1. Performing design review and plan checks of all drawings, specifications and procedures;

2. Conducting construction inspection;

3. Functioning as BLM's and the Energy Commission's delegate including reporting noncompliance issues or violations to the BLM Authorized Officer for action and taking any action allowed under the California Code of Regulations, including issuing a Stop Work Order, to ensure compliance;

4. Exercising access as needed to all project owner construction records, construction and inspection procedures, test equipment and test results; and

5. Providing weekly reports on the status of construction to BLM's Authorized Officer and the CPM.

PRE-CONSTRUCTION AND PRE-OPERATION COMPLIANCE MEETING

BLM's Authorized Officer and the CPM shall schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings is to assemble technical staff from BLM, the Energy Commission, the project owner and construction contractor to review the status of all pre-construction or pre-operation requirements, contained in BLM's and the Energy Commission's conditions of certification. This is to confirm that all applicable conditions of certification have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings ensure, to the extent possible, that BLM and Energy Commission conditions will not delay the construction and operation of the plant due to oversight and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

BLM AND ENERGY COMMISSION RECORD

BLM and the Energy Commission shall maintain the following documents and information as a public record, in either the Energy Commission's Compliance file or Dockets file, for the life of the project (or other period as required):

- All documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
- All monthly and annual compliance reports filed by the project owner;
- All complaints of noncompliance filed with BLM and the Energy Commission; and
- All petitions/requests for project or condition of certification changes and the resulting BLM, Energy Commission staff or Energy Commission action.

PROJECT OWNER RESPONSIBILITIES

The project owner is responsible for ensuring that the compliance conditions of certification and all other conditions of certification that appear in BLM's ROW Grant and the Energy Commission Decision are satisfied. The compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, conditions of certification, or ownership. Failure to comply with any of the conditions of certification or the compliance conditions may result in reopening of the case and revocation of the Energy Commission certification; an administrative fine; or other action as appropriate. A summary of the Compliance Conditions of Certification is included as **Compliance Table 1** at the conclusion of this section.

The BLM ROW grant holder will comply with the terms, conditions, and special stipulations of the ROW grant. Failure to comply with applicable laws or regulations or any of the terms and conditions of a BLM ROW grant may result in the suspension or termination of the ROW grant (43 CFR 2807.17). Prior to suspending or terminating a ROW grant, BLM will provide written notice to the holder stating it intends to suspend or terminate and will provide reasonable opportunity to correct any noncompliance.

COMPLIANCE MITIGATION MEASURES/CONDITIONS OF CERTIFICATION

Unrestricted Access (COMPLIANCE-1)

BLM's Authorized Officer, responsible BLM staff, the CPM, responsible Energy Commission staff, and delegated agencies or consultants shall be guaranteed and granted unrestricted access to the power plant site, related facilities, project-related staff, and the records maintained on-site, for the purpose of conducting audits, surveys, inspections, or general site visits. Although BLM's Authorized Officer and the CPM will normally schedule site visits on dates and times agreeable to the project owner, BLM's Authorized Officer and the CPM reserve the right to make unannounced visits at any time.

Compliance Record (COMPLIANCE-2)

The project owner shall maintain project files on-site or at an alternative site approved by BLM's Authorized Officer and the CPM for the life of the project, unless a lesser period of time is specified by the conditions of certification. The files shall contain copies of all "as-built" drawings, documents submitted as verification for conditions, and other project-related documents. As-built drawings of all facilities including linear facilities shall be provided to the BLM Authorized Officer for inclusion in the BLM administrative record within 90-days of completion of that portion of the facility or project.

BLM and Energy Commission staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files maintained pursuant to this condition.

Compliance Verification Submittals (COMPLIANCE-3)

Each condition of certification is followed by a means of verification. The verification describes the Energy Commission's procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified as necessary by BLM's Authorized Officer and the CPM.

Verification of compliance with the conditions of certification can be accomplished by the following:

1. Monthly and/or annual compliance reports, timely filed by the project owner or authorized agent, reporting on work done and providing pertinent documentation, as required by the specific conditions of certification;

2. Appropriate letters from delegate agencies verifying compliance;

3. BLM and Energy Commission staff audits of project records; and/or

4. BLM and Energy Commission staff inspections of work, or other evidence that the requirements are satisfied.

Verification lead times associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter subject line shall identify the project by AFC number, the appropriate condition(s) of certification by condition number(s), and a brief description of the subject of the submittal**. The project owner shall also identify those submittals not required by a condition of certification with a statement such as: "This submittal is for information only and is not required by a specific condition of certification." When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal and BLM/CEC submittal number.

The project owner is responsible for the delivery and content of all verification submittals to the BLM's Authorized Officer and CPM, whether such condition was satisfied by work performed by the project owner or an agent of the project owner.

All hardcopy submittals shall be addressed to each of the following:

BLM's Authorized Officer
(CACA-48668, 49502, 49503, and 49504)
U.S. Bureau of Land Management
1303 South Highway 95
Needles, CA 92363

Compliance Project Manager
(07-AFC-5C)
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814

Those submittals shall be accompanied by a searchable electronic copy, on a CD or by e-mail, as agreed upon by BLM's Authorized Officer and the CPM.

If the project owner desires BLM and/or Energy Commission staff action by a specific date, that request shall be made in the submittal cover letter and shall include a detailed explanation of the effects on the project if that date is not met.

Pre-Construction Matrix and Tasks Prior to Start of Construction (COMPLIANCE-4)

Prior to commencing construction, a compliance matrix addressing only those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to BLM's Authorized Officer and the CPM. This matrix will be included with the project owner's first compliance submittal or prior to the first pre-construction meeting, whichever comes first. It will be submitted in the same format as the compliance matrix described below. In order to begin any on-site mobilization or surface disturbing activities on public land, the BLM Authorized Officer must approve a written Notice to Proceed (NTP). NTPs will be phased as appropriate to facilitate timely implementation of construction.

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and BLM's Authorized Officer and the CPM have issued a letter and BLM has issued a NTP to the project owner authorizing construction. Various lead times for submittal of compliance verification documents to BLM's Authorized Officer and the CPM for conditions of certification are established to allow sufficient BLM and Energy Commission staff time to review and comment and, if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

Failure to submit compliance documents within the specified lead-time may result in delays in authorization to commence various stages of project development.

If the project owner anticipates commencing project construction as soon as the project is certified, it may be necessary for the project owner to file compliance submittals prior to project certification. Compliance submittals should be completed in advance where the necessary lead time for a required compliance event extends beyond the date anticipated for start of construction. The project owner must understand that the submittal of compliance documents prior to project certification is at the owner's own risk. Any approval by Energy Commission staff is subject to change, based upon BLM's ROW Grant and the Energy Commission Decision.

Compliance Reporting

There are two different compliance reports that the project owner must submit to assist BLM's Authorized Officer and the CPM in tracking activities and monitoring compliance with the terms and conditions of BLM's ROW Grant and the Energy Commission Decision. During construction, the project owner or authorized agent will submit Monthly Compliance Reports. During operation, an Annual Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions of certification require that compliance submittals be submitted to BLM's Authorized Officer and the CPM in the monthly or annual compliance reports.

Compliance Matrix (COMPLIANCE-5)

A compliance matrix shall be submitted by the project owner to BLM's Authorized Officer and the CPM along with each monthly and annual compliance report. The compliance matrix is intended to provide BLM's Authorized Officer and the CPM with the current status of all conditions of certification in a spreadsheet format. The compliance matrix must identify:

1. the technical area;
2. the condition number;
3. a brief description of the verification action or submittal required by the condition;
4. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.);
5. the expected or actual submittal date;
6. the date a submittal or action was approved by the Chief Building Official (CBO), BLM's Authorized Officer, CPM, or delegate agency, if applicable; and
7. the compliance status of each condition, e.g., "not started," "in progress" or "completed" (include the date).
8. if the condition was amended, the date of the amendment.

Satisfied conditions shall be placed at the end of the matrix.

Monthly Compliance Report (COMPLIANCE-6)

The first Monthly Compliance Report is due one month following the Energy Commission business meeting date upon which the project was approved, unless otherwise agreed to by BLM's Authorized Officer and the CPM. The first Monthly Compliance Report shall include the AFC number and an initial list of dates for each of the events identified on the **Key Events List. The Key Events List Form is found at the end of this section.**

During pre-construction and construction of each power plant, the project owner or authorized agent shall submit an original and an electronic searchable version of the Monthly Compliance Report within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain, at a minimum:

1. A summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
2. Documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter,

as well as the conditions they satisfy and submitted as attachments to the Monthly Compliance Report;

3. An initial, and thereafter updated, compliance matrix showing the status of all conditions of certification (fully satisfied conditions do not need to be included in the matrix after they have been reported as completed);

4. A list of conditions that have been satisfied during the reporting period, and a description or reference to the actions that satisfied the condition;

5. A list of any submittal deadlines that were missed, accompanied by an explanation and an estimate of when the information will be provided;

6. A cumulative listing of any approved changes to conditions of certification;

7. A listing of any filings submitted to, or permits issued by, other governmental agencies during the month;

8. A projection of project compliance activities scheduled during the next two months. The project owner shall notify BLM's Authorized Officer and the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification;

9. A listing of the month's additions to the on-site compliance file; and

10. A listing of complaints, notices of violation, official warnings, and citations received during the month, a description of the resolution of the resolved actions, and the status of any unresolved actions.

All sections, exhibits, or addendums shall be separated by tabbed dividers or as acceptable by BLM's Authorized Officer and the CPM.

Annual Compliance Report (COMPLIANCE-7)

After construction of each power plant is complete or when a power plant goes into commercial operation, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The reports are for each year of commercial operation and are due to BLM's Authorized Officer and the CPM each year at a date agreed to by BLM's Authorized Officer and the CPM. Annual Compliance Reports shall be submitted over the life of the project unless otherwise specified by BLM's Authorized Officer and the CPM. Each Annual Compliance Report shall include the AFC number, identify the reporting period and shall contain the following:

1. An updated compliance matrix showing the status of all conditions of certification (fully satisfied conditions do not need to be included in the matrix after they have been reported as completed);

2. A summary of the current project operating status and an explanation of any significant changes to facility operations during the year;

3. Documents required by specific conditions to be submitted along with the Annual Compliance Report. Each of these items must be identified in the transmittal letter, with the condition it satisfies, and submitted as attachments to the Annual Compliance Report;

4. A cumulative listing of all post-certification changes by the Energy Commission or changes to the BLM ROW grant or approved POD by BLM , or cleared by BLM's Authorized Officer and the CPM;

5. An explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;

6. A listing of filings submitted to, or permits issued by, other governmental agencies during the year;

7. A projection of project compliance activities scheduled during the next year;

8. A listing of the year's additions to the on-site compliance file;

9. An evaluation of the on-site contingency plan for unplanned facility closure, including any suggestions necessary for bringing the plan up to date [see Compliance Conditions for Facility Closure addressed later in this section]; and

10. A listing of complaints, notices of violation, official warnings, and citations received during the year, a description of the resolution of any resolved matters, and the status of any unresolved matters.

Confidential Information (COMPLIANCE-8)

Any information that the project owner deems confidential shall be submitted to the Energy Commission's Dockets Unit with an application for confidentiality pursuant to Title 20, California Code of Regulations, section 2505(a). Any information that is determined to be confidential shall be kept confidential as provided for in Title 20, California Code of Regulations, section 2501 et. seq. Any information the ROW holder deems confidential shall be submitted to the BLM Authorized Officer with a written request for said confidentiality along with a justification for the request. All confidential submissions to BLM should be clearly stamped "proprietary information" by the holder when submitted.

Annual Energy Facility Compliance Fee (COMPLIANCE-9)

Pursuant to the provisions of Section 25806(b) of the Public Resources Code, the project owner is required to pay the Energy Commission an annual compliance fee, which is adjusted annually. The amount of the fee for FY2009-2010 was $19,823. The initial payment is due on the date the Energy Commission adopts the final decision. You will be notified of the amount due. All subsequent payments are due by July 1 of each year in which the facility retains its certification. The payment instrument shall be made payable to the California Energy Commission and mailed to: Accounting Office MS-02, California Energy Commission, 1516 9th St., Sacramento, CA 95814.

Reporting of Complaints, Notices, and Citations (COMPLIANCE-10)

Prior to the start of construction, the project owner must send a letter to property owners living within one mile of the project notifying them of a telephone number to contact project representatives with questions, complaints or concerns. If the telephone is not staffed 24 hours per day, it shall include automatic answering with date and time stamp recording. All recorded complaints shall be responded to within 24 hours. The telephone number shall be posted at the project site and made easily visible to passersby during construction and operation. The telephone number shall be provided to BLM's Authorized Officer and the CPM who will post it on the Energy Commission's web page at:

http://www.energy.ca.gov/sitingcases/power_plants_contacts.html

Any changes to the telephone number shall be submitted immediately to BLM's Authorized Officer and the CPM, who will update the web page.

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies to BLM's Authorized Officer and the CPM of all complaint forms, including noise and lighting complaints, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the complaint form (Attachment A).

FACILITY CLOSURE

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to implement the Closure, Revegetation and Restoration Plan to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made that provide the flexibility to deal with the specific situation and project setting that exist at the time of closure. Laws, Ordinances, Regulations and Standards (LORS) pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure. Closure would be conducted in accordance with Condition of Certification BIO-14 that requires the project owner to develop and implement a Closure, Revegetation and Rehabilitation Plan.

There are at least three circumstances in which a facility closure can take place: planned closure, unplanned temporary closure and unplanned permanent closure.

CLOSURE DEFINITIONS

Planned Closure

A planned closure occurs when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

Unplanned Temporary Closure

An unplanned temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster or an emergency. Short-term is defined as cessation of construction activities or operations of a power plant for a period less than 6 months long. Cessation of construction of operations for a period longer than 6 months in considered a permanent closure.

Unplanned Permanent Closure

An unplanned permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unplanned closure where the owner implements the on-site contingency plan. It can also include unplanned closure where the project owner fails to implement the contingency plan, and the project is essentially abandoned.

COMPLIANCE CONDITIONS FOR FACILITY CLOSURE

Planned Closure (COMPLIANCE-11)

In order to ensure that a planned facility closure does not create adverse impacts, a closure process that provides for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a revision or update to the approved Closure, Revegetation and Rehabilitation Plan to BLM and the Energy Commission for review and approval at least 12 months (or other period of time agreed to by BLM's Authorized Officer and the CPM) prior to commencement of closure activities. The project owner shall file 50 copies and 50 CDs with the Energy Commission and 10 copies and 10 CDs with BLM (or other number of copies agreed upon by BLM's Authorized Officer and the CPM) of a proposed facility closure plan/Closure, Revegetation and Rehabilitation Plan.

The plan shall:

1. identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related materials that must be removed from the site;

2. identify a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;

3. address conformance of the plan with all applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of facility closure, and applicable conditions of certification; and.

4. Address any changes to the site revegetation, rehabilitation, monitoring and long-term maintenance specified in the existing plan that are needed for site revegetation and rehabilitation to be successful.

Prior to submittal of an amended or revised Closure, Revegetation and Restoration Plan, a meeting shall be held between the project owner, BLM's Authorized Officer and the Energy Commission CPM for the purpose of discussing the specific contents of the plan.

In the event that there are significant issues associated with the proposed facility Closure, Revegetation and Restoration plan's approval, or the desires of local officials or interested parties are inconsistent with the plan, BLM's Authorized Officer the CPM shall hold one or more workshops and/or BLM and the Energy Commission may hold public hearings as part of its approval procedure.

As necessary, prior to or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities until BLM and the Energy Commission approves the facility Closure, Revegetation and Restoration plan.

Unplanned Temporary Closure/On-Site Contingency Plan (COMPLIANCE-12)

In order to ensure that public health and safety and the environment are protected in the event of an unplanned temporary facility closure, it is essential to have an On-Site Contingency Plan in place. The On-Site Contingency Plan will help to ensure that all necessary steps to mitigate public health and safety impacts and environmental impacts are taken in a timely manner.

The project owner shall submit an On-Site Contingency Plan for BLM's Authorized Officer and CPM review and approval. The plan shall be submitted no less than 60 days (or other time agreed to by BLM's Authorized Officer and the CPM) after approval of any NTP or letter granting approval to commence construction for each phase of construction. A copy of the approved plan must be in place during commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with BLM's Authorized Officer and the CPM, will update the On-Site Contingency Plan as necessary. BLM's Authorized Officer and the CPM may require revisions to the On-Site Contingency Plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the On-Site Contingency Plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by BLM's Authorized Officer and the CPM.

The On-Site Contingency Plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days, unless other arrangements are agreed to by BLM's Authorized Officer and the CPM, the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment. (Also see specific conditions of certification for the technical areas of Hazardous Materials Management and Waste Management.)

In addition, consistent with requirements under unplanned permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the On-Site Contingency Plan. In addition, the status of the insurance coverage and major equipment warranties must be updated in the annual compliance reports.

In the event of an unplanned temporary closure, the project owner shall notify BLM's Authorized Officer and the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the On-Site Contingency Plan. The project owner shall keep BLM's Authorized Officer and the CPM informed of the circumstances and expected duration of the closure.

If BLM's Authorized Officer and the CPM determine that an unplanned temporary closure is likely to be permanent, or for a duration of more than 6 months, a Closure Plan consistent with the requirements for a planned closure shall be developed and submitted to BLM's Authorized Officer and the CPM within 90 days of BLM's Authorized Officer and the CPM's determination (or other period of time agreed to by BLM's Authorized Officer and the CPM).

Unplanned Permanent Closure/On-Site Contingency Plan (COMPLIANCE-13)

The On-Site Contingency Plan required for unplanned temporary closure shall also cover unplanned permanent facility closure. All of the requirements specified for unplanned temporary closure shall also apply to unplanned permanent closure.

In addition, the On-Site Contingency Plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the event of abandonment.

In the event of an unplanned permanent closure, the project owner shall notify BLM's Authorized Officer and the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the On-Site Contingency Plan. The project owner shall keep BLM's Authorized Officer and the CPM informed of the status of all closure activities.

To ensure that public health and safety and the environment are protected in the event of an unplanned temporary closure, the project owner shall submit an On-Site Contingency Plan no less than 60 days after a NTP is issued for each phase of development.

Post Certification Changes to BLM's ROW Grant and/or the Energy Commission Decision: Amendments, Ownership Changes, Insignificant Project Changes and Verification Changes (COMPLIANCE-14)

The project owner must petition the Energy Commission pursuant to Title 20, California Code of Regulations, section 1769, in order to modify the project (including linear facilities) design, operation or performance requirements, and to transfer ownership or operational control of the facility. The BLM ROW holder must file a written requests in the form an an application to the BLM Authorized Officer in order to change the terms and conditions of their ROW grant or POD. Written requests will be in a manner prescribed by the BLM Authorized Officer.

It is the responsibility of the project owner to contact BLM's Authorized Officer and **the CPM to determine if a proposed project change should be considered a project modification pursuant to section 1769.** Implementation of a project modification without first securing BLM and either Energy Commission or Energy Commission staff approval, may result in enforcement action in accordance with section 25534 of the Public Resources Code.

A Petition to Amend is required for changes to the project as specified below. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to BLM's Authorized Officer and the CPM, who will file it with the Energy Commission's Dockets Unit in accordance with Title 20, California Code of Regulations, section 1209.

The criteria that determine which type of approval and the process that applies are explained below. They reflect the provisions of Section 1769 at the time this condition was drafted. If the Commission's rules regarding amendments are amended, the rules in effect at the time an amendment is requested shall apply.

Amendment

The project owner shall petition the Energy Commission, pursuant to Title 20, California Code of Regulations, Section 1769(a), when proposing modifications to the project (including linear facilities) design, operation, or performance requirements. If a proposed modification results in deletion or change of a condition of certification, or makes changes that would cause the project not to comply with any applicable laws, ordinances, regulations or standards, the petition will be processed as a formal amendment to the Energy Commission's final decision, which requires public notice and review of the BLM-Energy Commission staff analysis, and approval by the full Energy Commission. The petition shall be in the form of a legal brief and fulfill the requirements

of Section 1769(a). Upon request, the CPM will provide you with a sample petition to use as a template.

The ROW holder shall file an application to amend the BLM ROW grant for any substantial deviation or change in use. The requirements to amend a ROW grant are the same as when filing a new application including paying processing and monitoring fees and rent.

Change of Ownership

Change of ownership or operational control also requires that the project owner file a petition pursuant to section 1769(b). This process requires public notice and approval by the full Commission and BLM. The petition shall be in the form of a legal brief and fulfill the requirements of Section 1769(b). Upon request, the CPM will provide you with a sample petition to use as a template. The transfer of ownership of a BLM ROW grant must be through the filing of an application for assignment of the grant.

Insignificant Project Change

Modifications that do not result in deletions or changes to conditions of certification, and that are compliant with laws, ordinances, regulations and standards may be authorized by BLM's Authorized Officer and the CPM as an insignificant project change pursuant to section 1769(a) (2). This process usually requires minimal time to complete, and it requires a Energy Commission 14-day public review of the Notice of Insignificant Project Change that includes the BLM and Energy Commission staff's intention to approve the modification unless substantive objections are filed. These requests must also be submitted in the form of a "Petition to Amend" as described above. BLM and the Energy Commission intend to integrate a process to jointly approve insignificant project changes to avoid duplication of approval processes and ensure appropriate documentation for the public record.

Verification Change

A verification may be modified by BLM's Authorized Officer and the CPM without requesting an amendment to the ROW Grant or Energy Commission decision if the change does not conflict with the conditions of certification and provides an effective alternate means of verification.

CBO DELEGATION AND AGENCY COOPERATION

In performing construction and operation monitoring of the project, BLM and Energy Commission staff act as, and have the authority of, the Chief Building Official (CBO). BLM and Energy Commission staff may delegate CBO responsibility to either an independent third party contractor or the local building official. BLM and the Energy Commission intend to avoid duplication by integrating the responsibilities of the CBO with those of a BLM compliance inspector and will work jointly in the selection of a CBO. BLM and Energy Commission staff retain CBO authority when selecting a delegate

CBO, including enforcing and interpreting federal, state and local codes, and use of discretion, as necessary, in implementing the various codes and standards.

BLM and Energy Commission staff may also seek the cooperation of state, regional and local agencies that have an interest in environmental protection when conducting project monitoring.

ENFORCEMENT

BLM's legal authority to enforce the terms and conditions of its ROW Grant is specified in 43 CFR 2807.16 to 2807.19. BLM may issue an immediate temporary suspension of activities it they determine a holder has violated one or more of the terms, conditions, or stipulation of the grant. BLM may also suspend or terminate a ROW grant if a holder does not comply with applicable laws and regulation or any terms, conditions, or special stipulations contained in the grant. Prior to suspending or terminating a ROW grant, BLM will provide written notice to the holder stating it intends to suspend or terminate and will provide reasonable opportunity to correct any noncompliance.

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Energy Commission Decision. The specific action and amount of any fines the Energy Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of LORS, oversight, unforeseeable events, and other factors the Energy Commission may consider.

ENERGY COMMISSION NONCOMPLIANCE COMPLAINT PROCEDURES

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1237, but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure, as described in current State law and regulations, are described below. They shall be followed unless superseded by future law or regulations.

Informal Dispute Resolution Process

The following procedure is designed to informally resolve disputes concerning the interpretation of compliance with the requirements of this compliance plan. The project owner, the Energy Commission, or any other party, including members of the public, may initiate an informal dispute resolution process. Disputes may pertain to actions or decisions made by any party, including the Energy Commission's delegate agents.

This process may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1237, but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The process encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be brought before the full Energy Commission for consideration via the complaint and investigation procedure.

Request for Informal Investigation

Any individual, group, or agency may request the Energy Commission to conduct an informal investigation of alleged noncompliance with the Energy Commission's terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner, BLM and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM find that further investigation is necessary, the project owner will be asked to promptly investigate the matter. Within seven working days of the CPM's request, provide a written report to the CPM of the results of the investigation, including corrective measures proposed or undertaken. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to also provide an initial verbal report, within 48 hours.

Request for Informal Meeting

In the event that either the party requesting an investigation or the Energy Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures proposed or undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within 14 days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

1. immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;

2. secure the attendance of appropriate Energy Commission staff and staff of any other agencies with expertise in the subject area of concern, as necessary;

3. conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner;

4. After the conclusion of such a meeting, promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum that fairly and accurately identifies the positions of all parties and any understandings reached. If an agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et seq.

Formal Dispute Resolution Procedure-Complaints and Investigations

Any person may file a complaint with the Energy Commission's Dockets Unit alleging noncompliance with a Commission decision adopted pursuant to Public Resources Code section 25500. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1237.

KEY EVENTS LIST

PROJECT/POWER PLANT: DOCKET #:

BLM'S AUTHORIZED OFFICER: _____

COMPLIANCE PROJECT MANAGER: _____

EVENT DESCRIPTION	DATE
Certification Date	
Obtain Site Control	
Online Date	
POWER PLANT SITE ACTIVITIES	
Start Site Mobilization	
Start Ground Disturbance	
Start Grading	
Start Construction	
Begin Pouring Major Foundation Concrete	
Begin Installation of Major Equipment	
Completion of Installation of Major Equipment	
First Roll of Steam Turbine	
Obtain Building Occupation Permit	
Start Commercial Operation	
Complete All Construction	
GENERATION TIE LINE ACTIVITIES	
Start Generation Tie Line Construction	
Synchronization with Grid and Interconnection	
Complete Generation Tie Line Construction	
FUEL SUPPLY LINE ACTIVITIES	
Start Gas Pipeline Construction and Interconnection	
Complete Gas Pipeline Construction	
WATER SUPPLY LINE ACTIVITIES	
Start Water Supply Line Construction	
Complete Water Supply Line Construction	

COMPLIANCE TABLE 1
SUMMARY of COMPLIANCE CONDITIONS OF CERTIFICATION

CONDITION NUMBER	SUBJECT	DESCRIPTION
COMPLIANCE-1	Unrestricted Access	The project owner shall grant BLM and Energy Commission staff and delegate agencies or consultants unrestricted access to the power plant site.
COMPLIANCE-2	Compliance Record	The project owner shall maintain project files on-site. BLM and Energy Commission staff and delegate agencies shall be given unrestricted access to the files.
COMPLIANCE-3	Compliance Verification Submittals	The project owner is responsible for the delivery and content of all verification submittals to BLM's Authorized Officer and the CPM, whether such condition was satisfied by work performed or the project owner or his agent.
COMPLIANCE-4	Pre-construction Matrix and Tasks Prior to Start of Construction	Construction shall not commence until the all of the following activities/submittals have been completed: • property owners living within one mile of the project have been notified of a telephone number to contact for questions, complaints or concerns, • a pre-construction matrix has been submitted identifying only those conditions that must be fulfilled before the start of construction, • all pre-construction conditions have been complied with, • BLM's Authorized Officer and the CPM have issued a letter to the project owner authorizing construction.
COMPLIANCE-5	Compliance Matrix	The project owner shall submit a compliance matrix (in a spreadsheet format) with each monthly and annual compliance report which includes the status of all compliance conditions of certification.
COMPLIANCE-6	Monthly Compliance Report including a Key Events List	During construction, the project owner shall submit Monthly Compliance Reports (MCRs) which include specific information. The first MCR is due the month following the Energy Commission business meeting date on which the project was approved and shall include an initial list of dates for each of the events identified on the Key Events List.

CONDITION NUMBER	SUBJECT	DESCRIPTION
COMPLIANCE-7	Annual Compliance Reports	After construction ends and throughout the life of the project, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports.
COMPLIANCE-8	Confidential Information	Any information the project owner deems confidential shall be submitted to BLM and the Energy Commission's Dockets Unit with a request for confidentiality.
COMPLIANCE-9	Annual fees	Payment of Annual Energy Facility Compliance Fee to the Energy Commission;
COMPLIANCE-10	Reporting of Complaints, Notices and Citations	Within 10 days of receipt, the project owner shall report to BLM's Authorized Officer and the CPM, all notices, complaints, and citations.
COMPLIANCE-11	Planned Facility Closure	The project owner shall submit any revisions or changes to the Closure, Revegetation and Restoration Plan to BLM's Authorized Officer and the CPM at least 12 months prior to commencement of a planned closure.
COMPLIANCE-12	Unplanned Temporary Facility Closure	To ensure that public health and safety and the environment are protected in the event of an unplanned temporary closure, the project owner shall submit an On-Site Contingency Plan no less than 60 days after a NTP is issued for each power plant.
COMPLIANCE-13	Unplanned Permanent Facility Closure	To ensure that public health and safety and the environment are protected in the event of an unplanned temporary closure, the project owner shall submit an On-Site Contingency Plan no less than 60 days after a NTP is issued for each power plant.
COMPLIANCE-14	Post-certification changes to the ROW Grant and/or Decision	The project owner must petition the Energy Commission and file an application to amend the ROW grant to delete or change a condition of certification, modify the project design or operational requirements and/or transfer ownership of operational control of the facility.

ATTACHMENT A
COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME: AFC Number:
COMPLAINT LOG NUMBER _____ Complainant's name and address: Phone number: _____
Date and time complaint received: Indicate if by telephone or in writing (attach copy if written): Date of first occurrence:
Description of complaint (including dates, frequency, and duration):
Findings of investigation by plant personnel: Indicate if complaint relates to violation of the ROW Grant: Indicate if complaint relates to violation of a CEC requirement: Date complainant contacted to discuss findings: _____
Description of corrective measures taken or other complaint resolution: Indicate if complainant agrees with proposed resolution: If not, explain: Other relevant information:
If corrective action necessary, date completed: _____ Date first letter sent to complainant: ___(copy attached) Date final letter sent to complainant: ___(copy attached)
This information is certified to be correct. Plant Manager's Signature: _____ Date:

(Attach additional pages and supporting documentation, as required.)

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DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Needles Field Office
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