United States Department of the Interior
Bureau of Land Management

Battle Mountain District Office
Battle Mountain Nevada
Tonopah Field Office
Tonopah, Nevada

September 3, 2010

DES 10-47

N- 86292
DOI-BLM-NVB020-2009-0104-EIS

Tonopah Solar Energy, LLC

Crescent Dunes Solar Energy Project

Draft

Environmental Impact Statement

BLM Mission Statement

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

BLM/NV/BM/EIS/10/30+1793

DOI No. DES 10-47

United States Department of the Interior

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In Reply Refer To:
N-86292
DOI-BLM-NVB020-2009-0104-EIS
2800 (NVB0200)

Dear Reader:

Enclosed for your review and comment is the Tonopah Solar Energy, LLC, Crescent Dunes Solar Energy Project Draft Environmental Impact Statement (DEIS), prepared by the Bureau of Land Management (BLM), Tonopah Field Office. The DEIS analyzes the direct, indirect, and cumulative impacts associated with the proposed construction and operation of the Crescent Dunes Solar Energy Project.

The public comment period begins September 3, 2010. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment, including your personal identifying information, may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to. In addition, information will be posted online at the BLM website: http://www.blm.gov/nv/st/en.html.

Comments on the DEIS can be mailed to the above address, Attn: Tim Coward, Renewable Energy Project Manager, faxed to (775) 482-7810, or e-mailed to crescent_dunes@blm.gov.

Comments should be postmarked or otherwise delivered to the Tonopah Field Office by close of business, October 18, 2010 to ensure full consideration. Comments may also be submitted at public meetings to be held:

- September 22, 2010 (6 pm – 8pm), Southern Nevada District Office, 4701 N. Torrey Pines Drive, Las Vegas, NV
- September 23, 2010 (6 pm – 8 pm), Tonopah Convention Center, 301 Brougher Ave., Tonopah, NV

A Final Environmental Impact Statement (FEIS) will be prepared that will consider the comments received during the public review and comment period. If you would like any additional information, please contact Tim Coward, Renewable Energy Project Manager, at (775) 482-7800.

Sincerely,

Thomas J. Seley

Thomas J. Seley
Field Manager

DRAFT
ENVIRONMENTAL IMPACT STATEMENT
TONOPAH SOLAR ENERGY, LLC
CRESCENT DUNES SOLAR ENERGY PROJECT

Lead Agency:	U. S. Department of the Interior Bureau of Land Management Battle Mountain District Office
Cooperating Agencies:	Department of Defense, Department of Energy, Nevada Department of Wildlife, Esmeralda County, Nye County, Town of Tonopah
Project Location:	Nye County, Nevada
Correspondence on This EIS Should be Directed to:	Tim Coward, Renewable Energy Project Manager Bureau of Land Management P.O. Box 911 Tonopah, NV 89049 (775) 482-7800

ABSTRACT

Tonopah Solar Energy, LLC applied to the BLM for a 7,680-acre right-of-way (ROW) on public lands to construct a concentrated solar thermal power plant facility approximately 13 miles northwest of Tonopah, Nye County, Nevada. The proposed project is not expected to use the total acres applied for in the ROW application. The facility is expected to operate for approximately 30 years. The proposed solar power project would use concentrated solar power technology, using heliostats or mirrors to focus sunlight on a receiver erected in the center of the solar field (the power tower or central receiver). A heat transfer fluid is heated as it passes through the receiver and is then circulated through a series of heat exchangers to generate high-pressure steam. The steam is used to power a conventional Rankine cycle steam turbine, which produces electricity. The exhaust steam from the turbine is condensed and returned via feedwater pumps to the heat exchangers where steam is regenerated. Hybrid cooling processes would be used for this project to minimize water use while continuing to maintain efficient power generation. The plant design would generate a nominal capacity of 110 megawatts.

The project's proposed facility design includes the heliostat fields, a 653-foot central receiver tower, a power block, buildings, a parking area, a laydown area, evaporating ponds, and an access road. A single overhead 230-kilovolt transmission line would connect the plant to the nearby Anaconda Moly substation.

This Draft Environmental Impact Statement analyzes the environmental effects of the Proposed Action, two action alternatives, and the No Action Alternative.

Responsible Official for EIS:	Thomas J. Seley Field Manager Tonopah Field Office

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Acronyms, Abbreviations, and Glossary

AC	alternating current
ACC	air cooled condenser
ACEC	Area of Critical Environmental Concern
ACHP	Advisory Council on Historic Preservation
AF	acre-feet
AFY	acre-feet per year
ALR	action leakage rate
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
Amsl	above mean sea level
ANSI	American National Standards Institute
APE	area of potential effects
ASTM	American Society of Testing and Materials
AUM	animal unit months
BACP	Nevada Bureau of Air Quality Planning
bgs	below ground surface
BLM	U.S. Bureau of Land Management
BMPs	best management practices
CAS	Chemical Abstract Service number
CCAR	California Climate Action Registry
CERCLA (or superfund)	Comprehensive Environmental Response, Compensation and Liability Act
CESA	cumulative effects study area
CFR	Code of Federal Regulations
CEQ	Council on Environmental Quality
CH_4	methane
CMPs	corrugated metal pipes
CO	carbon monoxide

CO_2	carbon dioxide
CSP	concentrating solar power technology
CVSA	Commercial Vehicle Safety Alliance
CWMA	Cooperative Weed Management Areas
dB	decibel
dBA	A-weighted decibel
DC	direct current
DCS	Distributed Control System
DEIS	Draft Environmental Impact Statement
DHS	U.S. Department of Homeland Security
DOD	U.S. Department of Defense
DOI	U.S. Department of the Interior
EAI	Ecological Area Inventory
EIS	Environmental Impact Statement
EO	Executive Order
EPCRA	Emergency Planning and Community Right to Know Act
EPA ID	Environmental Protection Agency Identification number
EPA	U.S. Environmental Protection Agency
EPAct	Energy Policy Act of 2005
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Act
FHWA	Federal Highway Administration
FLPMA	Federal Land Policy and Management Act
ft^2	square feet
gal	gallon
GAP	Southwest Regional Gap Analysis Project
GBBO	Great Basin Bird Observatory

GIS	Geographic Information Systems
GLO	General Land Office
GPS	Global Positioning System
GSU	Generator Step-Up
HAP	hazardous air pollutant
HDR	HDR Engineering, Inc.
HFC	hydrofluorocarbon
HMA	Herd Management Area
HMBP	Hazardous Materials Business Plans
HPMP	Historic Property Management Plan
HTF	heat transfer fluid
HUD	U.S. Housing and Urban Development
IEEE	Institute of Electrical and Electronics Engineers Standards
IMACS	Intermountain Archeological Computer System
I/O	Input/Output
JBR	JBR Environmental Consultants, Inc.
KEC	Kautz Environmental Consultants, Inc.
KNO_3	potassium nitrate
KOP	key observation points
kV	kilovolt
L_{dn}	Day-night noise level
L_{eq}	equivalent noise level or average noise level
m^2	square meters
MBTA	Migratory Bird Treaty Act
MLRA	Major Land Resource Areas
MSDS	Material Safety Data Sheets
MW	megawatt
N_2O	nitrous oxide

NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
$NaNO_3$	sodium nitrate
NBMG	Nevada Bureau of Mines and Geology
NDA	Nevada Department of Agriculture
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Agency
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NO_x	oxides of nitrogen
NO_2	nitrogen dioxide
NOI	Notice of Intent
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRS	Nevada Revised Statute
NVCRIS	Nevada Cultural Resource Information System
NWAC	Nevada Weed Action Committee
O_3	ozone
OSHA	Occupational Safety and Health Administration
Pb	lead
PFC	perfluorocarbon
PGA	peak ground acceleration
PL	Public Law
PLC	Programmable Logic Controllers

PM_{10}	particulate matter
$PM_{2.5}$	fine particulate matter
POI	point of interconnection
PSD	prevention of significant deterioration
psia	pressure per square inch
PUC	Public Utilities Commission
PWR	Public Water Reserves
PCRA	Resources Conservation and Recovery Act
RMP	Resource Management Plan
ROD	Record of Decision
ROW	right-of-way
RPS	renewable portfolio standard
SCADA	Supervisory Control and Data Acquisition
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SCS	Soil Conservation Service
SF_6	sulfur hexafluoride
SH	State Highway
SHPO	State Historic Preservation Office
SO_x	oxides of sulfur
SO_2	sulfur dioxide
SPCC	Spill Prevention Control and Countermeasure
SRMA	Special Recreation Management Area
STG	steam turbine generator
SWPPP	Stormwater Pollution Prevention Plan
TCLP	Toxicity Characteristic Leaching Procedure
TCP	traditional cultural property
TDS	total dissolved solids
TFO	Tonopah Field Office

TL	transmission line
TSE	Tonopah Solar Energy, LLC
UAT	unit auxiliary transformer
UPS	uninterruptible power supply
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
V	volt
VOC	volatile organic compound
Wh	Watt-hours
Wig	interagency working group on environmental justice
WMP	Weed Management Plan
WSS	web soil survey

Executive Summary

The U.S. Bureau of Land Management (BLM) has prepared this Environmental Impact Statement (EIS) to analyze potential environmental impacts associated with approval of development of the Crescent Dunes Solar Energy Project. Tonopah Solar Energy, LLC (TSE), the Proponent, has proposed construction of this solar power generation facility in Nye County, Nevada. Nevada Department of Wildlife, Nye County, Esmeralda County, U.S. Department of Defense-Air Force, and the Department of Energy (DOE) accepted invitations to be cooperating agencies in the development of this document. The DOE is a cooperating agency on this EIS pursuant to an MOU between DOE and BLM signed in April 2010.

Project Purpose and Need

The BLM Tonopah Field Office (TFO) has received a ROW application from TSE (Proponent) and must consider permitting the solar facility. The Proponent proposes to construct, operate, and decommission a solar power electric generation facility and associated infrastructure on lands managed by the TFO. The TFO's purpose is to respond to the Proponent's ROW grant application under Title V of the Federal Land Policy and Management Act (FLPMA) (43 USC 1761) for completeness and in compliance with the FLPMA, BLM ROW regulations, and other applicable federal and state laws.

The TFO's need is to consider permitting TSE's application under the BLM's CFR 2800 while, based on the BLM's EIS, limiting undue or unnecessary degradation of public lands.

Proponent's Intended Use of the Project

The proposed project would contribute much needed on-peak power to the electrical grid that serves the western United States as demand for power continues to grow in these states. The thermal storage capability of this technology allows renewable electricity to be produced even when the peak demand period extends into the late evening hours. As older technology fossil-fuel plants reach the end of their useful lives, replacing them with clean, reliable energy sources is a net benefit. The Proponent has executed a Power Purchase Agreement with NV Energy for sale of the electricity produced from the facility. The facility is expected to produce approximately 110 MW of power.

Project Description

The proposed solar facility will use Concentrating Solar Power (CSP) technology to generate electricity. This specific technology uses heliostat/reflecting mirrors to redirect sunlight on a receiver erected in the center of the solar field (called the central receiver). The central receiver consists of a series of tubes through which a liquid salt passes and is heated by the concentrated solar energy. The heated salt is then routed to a large insulated tank where it can be stored with minimal energy loss. When electricity is to be generated, the heated salt is circulated through a series of heat exchangers to generate high-pressure, superheated steam that is used to power a conventional Rankine cycle steam turbine/generator to produce electricity. Energy produced from the facility would interconnect to the

electrical grid through a new transmission line extending to the existing NV Energy Anaconda Moly Substation, approximately 6 miles north of the site.

Major project components include:

- a solar field consisting of a large area of heliostats
- a central receiving tower
- a conventional steam turbine to generate electricity
- thermal storage tanks to store the hot and cold liquid salt
- a hybrid cooling system (i.e., an air-cooled condenser with a wet cooling augmentation system designed to minimize water consumption by use only during times of high electricity demand)
- a water treatment system and evaporation ponds to remove impurities from the groundwater, thereby protecting the turbine
- associated equipment such as pumps, transformers, heat exchangers, and buildings
- associated linear facilities, including a TL and access road, and
- a borrow pit for aggregate.

This EIS analyzes the environmental effects of the Proposed Action, the No Action Alternative, and two alternatives. The Proposed Action would:

- Approve a right-of-way (ROW) application submitted by TSE to construct and operate a 110-megawatt (MW) solar power generating facility based on concentrating solar power technology (CSP), an approximately 9.5-mile 230 kilovolt (kV) TL, and the temporary use of a 40-acre borrow pit to extract aggregate for construction. The technology uses heliostats (reflecting mirrors) to redirect sunlight onto a receiver erected in the center of a solar field. The solar power facility is proposed to be located on BLM-managed lands in Nye County, Nevada.

Project Location

The proposed project site is located in south-central Nevada, approximately 13.5 miles northwest of Tonopah, in Nye County. The project is located within the southern portion of the Big Smoky Valley, north of US Highway 95/6 along Poleline Road (State Highway 89). The proposed project would be built on lands administered by BLM. BLM's general solar policy is to facilitate environmentally responsible commercial development of solar energy projects on public lands and to use solar energy systems on BLM facilities where feasible (BLM 2007). Given BLM's solar policy and the advantage of the BLM controlling large areas of land in the southwestern United States, the Proponent is proposing this project on BLM-administered lands as opposed to private lands.

Summary of Potential Impacts

Vegetation

Construction activities associated with the Proposed Action Alternative would result in direct effects, including the removal of topsoil and vegetation within the project areas during grading activities. Approximately 1,628-1,673 acres will be graded in order to construct the project facilities (i.e.,

heliostats, administrative buildings, access road, borrow pit and transmission line poles), and an additional 167-213 acres will be temporarily disturbed during construction. Revegetation and reclamation activities would be implemented on the temporarily disturbed sites at the end of construction. Following decommissioning and removal of the project, revegetation and reclamation of the site would result in eventual reestablishment of the vegetative cover.

Noxious weeds and Invasive Species

No federal or state listed noxious weeds were observed in the study area. However, invasive species such as Russian thistle and halogeton were present in the study area and may further proliferate in localized areas. Implementation of the reclamation plan and BMPs would reduce the potential for noxious weeds and introductions into and invasive species proliferation throughout the area. The Proponent developed a Preliminary Weed Risk Assessment and will develop Weed Management Plan (WMP) for the project. The WMP will prescribe management actions for monitoring and eradicating specified species by BLM-approved methods. The WMP also will describe applicable processes for the use of herbicides on federally managed lands in Nevada, and provide the basis for proper management and use of herbicides in the project area.

Wildlife Resources

Impacts to wildlife are anticipated to include the loss of habitat due to construction of the facility, excavation of aggregate in the borrow pit, and construction of the transmission line, and access road. During these activities, wildlife that is unable to flee the area may be injured or killed by heavy equipment. Additional injuries or deaths may occur because of vehicle collisions by construction and operation vehicles, as well as employees commuting to and from their residences and the project site. Evaporation ponds will be covered by a porous screen so wildlife will not be affected by the brine solution being generated during operation.

Special Status Species (Plants)

Construction activities associated with the proposed project would directly affect Nevada oryctes, a BLM Sensitive Species, by removing plants and suitable habitat within the project areas during grading activities to construct the project facilities (i.e., heliostats, power block, evaporation ponds, and administrative buildings), and a paved access road.

Special Status Species (Wildlife)

Mammals: Pale Kangaroo Mice and Bats: Impacts to pale kangaroo mice would include direct mortality during grading and the removal of suitable habitat. Direct effects to pale kangaroo mice and bats may result from the operation of the facility's evaporation ponds. The water in the evaporation ponds would be saturated with salt (making a brine solution). If mice or bats ingest water from the pond, they may become ill or die from sodium toxicity. A porous screen will cover the ponds so that mice or bats are excluded from the pond. Additionally, the proposed project would introduce transmission lines into the area providing opportunities for avian predators such as owls and other raptors. The potential presence of these predators may increase predation pressure on the pale kangaroo mouse and sensitive bat species.

Golden eagles and Migratory Birds: Impacts to Golden eagles and other migratory birds would include potential injury or mortality due to the operation of the facility and transmission line and the removal of approximately 1,628-1,673 acres of potential foraging habit. Also, birds may be injured or killed because of collisions with vehicles, colliding with the mirrors and other structures, and flying through the concentrated solar rays near the receiver. Reflections from the heliostat arrays may mimic water potentially attracting migratory birds to the site.

Water Quality and Quantity

Groundwater: Drawdown in excess of 10 feet will not extend beyond the proposed project site; some of the existing wells in the area will experience a drawdown of between 1-foot to 1.5-feet. Potential direct impacts to groundwater include possible contamination entering the groundwater around the wellhead (due to hazardous materials on-site), proposed well pumping causing drawdown affecting wells, and restrictions to existing well access or use.

Surface Water: Potential direct impacts to surface water associated with the project include increased runoff flows, increased sediment transport, increased discharge and transport of contaminants, or possible affects to drainage paths or altered flow.

Wetlands, Riparian Zones, and Waters of the U.S.

No impacts to jurisdictional wetlands or other special aquatic or riparian sites will occur, as these resources were not present in the project area.

Air Quality

Emissions associated with construction activities and the operational phases of the plant are within established federal, state, and regional thresholds. Furthermore, the proposed project is located in a region that EPA has categorized as an attainment area for all regulated pollutants. As such, the proposed project with all its proposed emission control strategies is not expected to cause a violation of established air quality standards and will conform to federal air quality goals and objectives. Through the permit application process with the Nevada Department of Environmental Protection, Bureau of Air Pollution Control, the proposed project will also have conformed to regional air quality requirements and objectives.

Cultural

Development of the Proposed Action Alternative would impact four historic properties. A total of eight historic properties would be impacted by Alternative 2. Only one known historic property would be impacted by Alternative 1. No impacts are anticipated for the Transmission Line and Substation or the borrow pit. Unanticipated discoveries during project construction could result in impacts to yet unidentified historic properties for any of the alternatives as well as the Transmission Line and Substation or borrow pit.

Native American Religious Concerns

At this time, given the known and provided information, there exists some potential (not definitive) to impact project area specific archaeological sites and associated artifacts of concern. Potential impacts

could occur because of cultural resources treatment plan implementation and the lack of avoidance of pre-historic and/or ethno-historic archaeological sites. Based on previous consultations, historic sites appear to be of little concern, unless they are associated with specific family histories and ancestral habitations (i.e. homesteads located on turn of the century allotment lands).

Considering some impacts may not be known until after (or during) project development (i.e. inadvertent discovery of previously unidentifiable subsurface deposits) and the fact that consultation is ongoing, specific resource identification and subsequent determinations of impact are not conclusive.

Land Use and Access

Potential impacts on Land Use and Access from the proposed project and its various components are relatively limited. The proposed project and the associated alternatives would not create hazards to air traffic according to determinations reached by the FAA. Alternative 1 encroaches on a right-of-way avoidance area for recreation and a no surface occupancy area for mining, both associated with the Crescent Dunes. Existing rights-of-way, mining claims, and other leases have been identified near or within the proposed project, but none of these has been identified as potentially conflicting with the project.

Soils

The potential for direct impacts, indirect impacts, and cumulative impacts associated with construction of the project are present. These impacts may include increased erosion, increased soil compaction, and diminished potential for revegetation. Direct impacts, indirect impacts, and cumulative impacts associated with operation of the project are not expected. Top soil removed during clear and grub activity and grading and excavation required for construction will be collected and stockpiled on-site. Stockpiles will be protected from wind and water erosion through establishment of native vegetation and temporary or permanent erosion control BMPs including weed-free straw bales or wattles for the duration of facility construction, operation, and decommission. Following decommissioning, the stockpiled topsoil will be replaced across the site where topsoil was previously removed to provide a proper soil substrate for seeding or planting and enhance re-establishment of native vegetation to pre-construction conditions.

Social and Economics

Social and economic impacts may occur as a result of construction and of operation of the proposed project. While some construction workforce is available locally, the majority will be relocating to the surrounding communities temporarily. This could increase local population by 20 percent or more during the peak of construction, resulting in the need for temporary workforce housing, thereby impacting the local infrastructure. Through direct and indirect impact, approximately 1,500 jobs would be created, $140 million of personal income would be added to the State of Nevada annually, and $160 million would be added to the gross state product annually during the peak of construction.

While some operations and maintenance workforce is available locally, the majority will be relocating to the surrounding communities. This could increase local population by 2 percent or more during operation of the facility. However, enough existing residential property exists to accommodate the

relocating workforce. Through direct, indirect, and induced impact, during operations and maintenance of the facility, approximately 200 jobs would be created, $30 million of personal income would be added to the State of Nevada annually, and $22.7 million would be added to the gross state product annually.

Noise

Temporary noise impacts may be experienced during the construction of any part of the proposed facility. However, no sensitive receptors were identified in the project area; therefore, no impacts to sensitive receivers are likely to occur.

Visual

The proposed solar energy generating facility and associated components would have an estimated footprint of approximately 1,600 acres that would house the solar field, administration buildings, evaporation pond, generation transmission tie line, substation, and ancillary facilities. Based on evaluations of key observation points and the lack of sensitive receptors in the area, impacts to the visual context of the project is moderate, except for the Crescent Dunes recreational area where the impact is expected to be major.

Hazardous Materials and Other Waste

The construction activities associated with the proposed project will result in an increase risk of accidental hazardous material spills from vehicles and heavy equipment. These risks will be mitigated with the implementation of operational plans and best management practices. Start-up and operation of the facility will involve large volumes of heated molten salt, which if released, could be harmful to the local natural resources within the project footprint. In addition, the water treatment facility will generate effluent that is placed in ponds to allow the water to evaporate, producing a brine material. Spills of these materials are unlikely given the design and management practices to be in place throughout construction and operation of the facility.

Range Resources and Wild Horses

The proposed project will result in the removal of approximately 1,628-1,673 acres of the San Antone allotment from forage production and the associated reduction in grazing potential. The loss of this amount of forage production equates to approximately 52 AUMs of grazing potential. To maintain current ecological condition of the range, the current preference of 13,505 AUMs for the grazing permit in this allotment would be reduced to 13,453 AUMs, a reduction of 0.4%. No Wild Horse Management Areas are near the proposed project, therefore wild horses and burros would not be affected.

Recreation / Wilderness

The proposed project would result in the loss of approximately 1,628-1,673 acres of BLM land that is currently used for recreational activities such as hunting. Alternative 1 will affect approximately 130 acres of the Special Recreation Management Area associated with the Crescent Dunes, which is used primarily as an off-road vehicle use area. No wilderness areas or wilderness study areas are within 25 miles of the project area.