U.S. Department of the Interior
Bureau of Land Management

Categorical Exclusion DOI-BLM-NV-S010-2014-0025-CX
January 2014

Geotechnical Investigation

Categorical Exclusion

File Number: N-92794

PREPARING OFFICE
U.S. Bureau of Land Management
Southern Nevada District Office
Las Vegas Field Office
4701 North Torrey Pines Drive
Las Vegas, Nevada 89130

BLM

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.

1.0 BACKGROUND

Silver State Solar Power South, LLC, submitted a Land Use Application and Permit (LUP) on December 16, 2013, to conduct a geotechnical investigation and install water wells for aquifer testing in support of the Silver State Solar South Project N-85801, N-89530, and N-90823, located near Primm, Nevada. The impacts of the proposed Silver State Solar South project have been analyzed in the Final Supplemental Environmental Impact Statement (FSEIS) for the Silver State Solar South Project and Proposed Las Vegas Field Office Resource Management Plan Amendment (BLM 2013).

BLM Office: Las Vegas Field Office

Lease/Serial/Case File Number: N-85801, N-89530, and N-90823

Proposed Action Title/Type: Geotechnical investigation and water wells for aquifer testing.

Location of the Proposed Action: The proposed action is located immediately west of Primm, Nevada in the Mount Diablo Meridian, Nevada, T. 26 S., R 59 E. Sections 34 and 35 and T. 27 S., R. 59 E. Sections 2, 3, 9, 10, 11, 14, and 15. Location information for bore holes, test pits, and water wells is presented in Table 1.

Table 1. Geotechnical Investigation Location Information

Test ID	Latitude	Longitude	Township, Range, Section	Boring Depth (feet)	DC Resistivity (Max Spacing) (feet)	Test Disturbance (square feet)	New 10-Foot-Wide Access Disturbance (square feet)	Total Temporary Disturbance (square feet)
B-01	W115° 20' 57.72"	N35° 38' 30.39"	T 26S R 59E S34	50	NA	600	1,850	2,450
B-02	W115° 20' 59.07"	N35° 38' 28.41"	T 26S R 59E S34	35	200	600	440	1,040
B-03	W115° 21' 00.42"	N35° 38' 26.43"	T 26S R 59E S34	50	NA	600	2,290	2,890
B-04	W115° 20' 56.71"	N35° 38' 28.35"	T 26S R 59E S34	35	NA	600	990	1,590
B-05	W115° 20' 57.85"	N35° 38' 26.84"	T 26S R 59E S34	35	NA	600	690	1,290
B-06	W115° 20' 59.20"	N35° 38' 25.15"	T 26S R 59E S34	35	NA	600	1,890	2,490
B-07	W115° 20' 54.24"	N35° 38' 28.81"	T 26S R 59E S34	35	NA	600	650	1,250
B-08	W115° 20' 54.77"	N35° 38' 26.46"	T 26S R 59E S34	50	200	600	1,110	1,710
B-09	W115° 20' 56.94"	N35° 38' 24.85"	T 26S R 59E S34	35	NA	600	1,360	1,960
B-10	W115° 20' 50.79"	N35° 38' 24.66"	T 26S R 59E S34	50	NA	600	1,160	1,760
B-11	W115° 20' 54.85"	N35° 38' 24.90"	T 26S R 59E S34	50	NA	600	530	1,130
B-12	W115° 20' 54.59"	N35° 38' 20.05"	T 26S R 59E S34	50	NA	600	0	600
B-13	W115° 21' 03.06"	N35° 38' 16.24"	T 26S R 59E S34	50	NA	600	2,170	2,770
B-14	W115° 21' 00.70"	N35° 38' 08.95"	T 26S R 59E S34	50	NA	600	930	1,530
B-15	W115° 20' 55.49"	N35° 38' 02.84"	T 26S R 59E S34	50	NA	600	830	1,430
B-16	W115° 20' 36.05"	N35° 38' 06.49"	T 26S R 59E S35	50	NA	600	700	1,300
B-17	W115° 20' 33.43"	N35° 38' 04.53"	T 26S R 59E S35	50	NA	600	2,230	2,830
B-18	W115° 20' 40.79"	N35° 36' 13.65"	T 27S R 59E S15	50	NA	600	10,120	10,720
B-19	W115° 20' 40.61"	N35° 36' 23.65"	T 27S R 59E S10	50	NA	600	7,780	8,380
B-20	W115° 20' 40.41"	N35° 36' 33.66"	T 27S R 59E S10	50	NA	600	0	600
B-22	W115° 20' 40.31"	N35° 37' 03.68"	T 27S R 59E S10	50	NA	600	0	600

B-23	W115° 20' 40.54"	N35° 37' 39.07"	T 27S R 59E S3	50	NA	600	0	600
B-24	W115° 20' 28.35"	N35° 37' 48.81"	T 27S R 59E S2	50	NA	600	0	600
B-25	W115° 20' 29.81"	N35° 37' 58.19"	T 26S R 59E S34	50	NA	600	1,960	2,560
B-26	W115° 20' 33.91"	N35° 37' 59.25"	T 27S R 59E S2	50	NA	600	0	600
B-27	W115° 20' 33.44"	N35° 38' 00.11"	T 27S R 59E S2	35	NA	600	1,150	1,750
B-28	W115° 20' 34.30"	N35° 38' 00.10"	T 27S R 59E S2	35	NA	600	600	1,200
B-29	W115° 20' 33.44"	N35° 38' 01.39"	T 27S R 59E S2	35	NA	600	1,970	2,570
B-30	W115° 20' 43.33"	N35° 36' 41.70"	T 27S R 59E S10	50	NA	600	0	600
B-31	W115° 20' 43.34"	N35° 36' 37.56"	T 27S R 59E S10	50	NA	600	0	600
B-32	W115° 20' 29.84"	N35° 37' 50.23"	T 27S R 59E S2	50	NA	600	0	600
B-33	W115° 20' 29.79"	N35° 38' 05.61"	T 26S R 59E S35	50	NA	600	3,200	3,800
B-34	W115° 20' 44.91"	N35° 36' 43.37"	T 27S R 59E S10	50	NA	600	0	600
B-35	W115° 20' 25.16"	N35° 37' 45.76"	T 27S R 59E S2	50	NA	600	0	600
B-36	W115° 20' 40.56"	N35° 36' 41.84"	T 27S R 59E S10	50	NA	600	0	600
ER-1	W115° 20' 33.88"	N35° 38' 00.24"	T 27S R 59E S2	NA	850	600	0	600
T-01	W115° 20' 12.76"	N35° 38' 19.41"	T 26S R 59E S35	Test Pit*	350	600	0	600
T-02	W115° 20' 15.68"	N35° 37' 59.64"	T 27S R 59E S2	Test Pit*	350	600	0	600
T-03	W115° 20' 03.53"	N35° 38' 09.17"	T 26S R 59E S35	Test Pit*	350	600	0	600
T-04	W115° 20' 26.96"	N35° 37' 51.00"	T 27S R 59E S2	Test Pit*	350	600	0	600
T-09	W115° 20' 38.73"	N35° 37' 21.63"	T 27S R 59E S3	Test Pit*	350	800	0	800
T-10	W115° 20' 28.15"	N35° 37' 12.56"	T 27S R 59E S2	Test Pit*	350	600	0	600
T-11	W115° 20' 49.53"	N35° 37' 06.32"	T 27S R 59E S10	Test Pit*	350	800	0	800
T-12	W115° 20' 38.60"	N35° 36' 56.18"	T 27S R 59E S10	Test Pit*	350	600	0	600
T-13	W115° 20' 18.25"	N35° 36' 58.04"	T 27S R 59E S11	Test Pit*	350	800	0	800
T-14	W115° 20' 30.71"	N35° 36' 47.85"	T 27S R 59E S11	Test Pit*	350	600	0	600
T-15	W115° 20' 04.38"	N35° 36' 48.11"	T 27S R 59E S11	Test Pit*	350	800	0	800
T-16	W115° 21' 52.41"	N35° 36' 32.24"	T 27S R 59E S9	Test Pit*	350	600	0	600
T-18	W115° 20' 55.19"	N35° 36' 40.12"	T 27S R 59E S10	Test Pit*	350	600	0	600
T-19	W115° 20' 38.91"	N35° 36' 30.63"	T 27S R 59E S11	Test Pit*	350	800	0	800
T-20	W115° 19' 57.35"	N35° 36' 29.14"	T 27S R 59E S11	Test Pit*	350	600	0	600
T-21	W115° 19' 40.62"	N35° 36' 30.32"	T 27S R 59E S11	Test Pit*	350	800	0	800
T-23	W115° 20' 50.99"	N35° 36' 12.50"	T 27S R 59E S3	Test Pit*	350	800	0	800
T-24	W115° 20' 09.24"	N35° 36' 36.12"	T 27S R 59E S14	Test Pit*	350	800	0	800
T-27	W115° 19' 38.19"	N35° 35' 53.14"	T 27S R 59E S14	35	NA	600	0	600
T-29	W115° 19' 42.81"	N35° 36' 09.94"	T 27S R 59E S14	35	NA	800	0	800
T-29	W115° 19' 51.53"	N35° 38' 00.28"	T 27S R 59E S2	35	NA	600	0	600
							Total (Square Feet)	**82,600**
							Total (Acres)	**1.90**

*Thermal Resistivity Testing Location
NA – Not Applicable

2.0 DESCRIPTION OF THE PROPOSED ACTION

2.1 Introduction

Silver State Solar Power South, LLC is applying for BLM approval to perform geotechnical investigation to determine soil composition and to install water wells for aquifer testing. Geotechnical data collected would be analyzed to select the type and size of foundations required for project structures and equipment associated with the Silver State Solar South project. Additionally, data regarding the soil's resistance to electric current flow would be collected and used for the electrical grounding design to ensure the project meets electrical safety codes. Percolation testing would also be conducted for the design of on-site septic systems at the temporary construction area and the permanent operations and maintenance building. All testing would be located within the Silver State Solar South project area analyzed in the FSEIS (BLM 2013).

2.2 Geotechnical Investigation

The geotechnical investigation would involve drilling 12 soil borings to a depth of 35 feet, drilling 26 soil borings to a depth of 50 feet, and excavating 18 test pits to a depth of approximately 10 feet. Borings would be drilled with a soil-boring machine, and test pits would be excavated by a rubber-tired backhoe. A pickup truck support vehicle would be mounted with both the soil-boring machine and backhoe. A soil resistivity survey would be conducted using hand-carried equipment at sampling locations (see Table 1). An overview of soil borings and test pits is shown in the attached LUP. Test location coordinates are also presented in Table 1.

At each boring and test pit location, a steel test post (6–8 inches diameter) will be driven into the ground to a depth of 6 to 12 feet using a light duty truck–mounted impact post pounder. A test post would be located within the previously disturbed area for each boring and test pit. Static tests would be performed to measure the strength of the embedded post. Once testing is completed, the post would be removed, the holes backfilled, and each site would be returned to its prior existing condition.

Global positioning system (GPS) equipment would be used to record the exact location of each boring and test pit, including the route to each test location and the corners of each work area. Access would be via existing roads, trails, or washes to the extent possible. Where new access is needed, the access path would be no more than 10 feet wide.

Soil-boring activities would require an approximately 20 × 30–foot (600-square-foot) work area at each location. A truck-mounted drilling rig would use hollow-stemmed auger drilling to bore an approximately 6-inch-diameter hole. In areas along the proposed gen-tie and within the proposed substation, borings would be 35 to 50 feet to account for the structure and substation equipment foundations. Soil samples of 0.5 pound of material would be collected every 2.5 feet for the first 15 feet of depth and every 5 feet thereafter. The remaining soil would be deposited on the ground adjacent to the sampling location. At each sample location, a hollow metal tube would be driven 18 inches below the bottom of the auger to determine the strength of the native soil material. Upon completion, the bore hole would be backfilled and any remaining material removed.

Each test pit excavation would require a work area up to 20 feet by 40 feet (800 square feet). A rubber-tired backhoe would be used to excavate each pit to a depth of approximately 10 feet. Each pit would be approximately 3 feet wide and 6 feet long at the bottom. Before excavation, the top 4 inches of soil would be removed and stockpiled near the pit for replacement once sampling has been completed and the pit has been backfilled. Spoils material from the excavation would be placed adjacent to each side of the test pit.

After inspection, data recording, and soil sample collection (approximately 100 pounds at each test pit) by an engineer or geologist, the pit would be backfilled using the backhoe.

Soil electrical resistivity measurements would be obtained at 28 locations, as described in the attached LUP, using equipment brought in via pickup truck. Access to resistivity testing would be via existing roads, trails, or washes to the extent feasible. Testing equipment would be hand carried during testing. Soil resistance measurements would be taken with four 3/8 inch metal roads connected by 20-gauge wire to an electrical source (12-volt DC battery). The rods would be inserted 2 to 6 inches into the ground such that the four rods form a straight line with the electrical source in the middle. Each rod would be inserted into the ground at varying spacing, up to a maximum road spacing of 350 feet, with the exception of a single test at the substation that would require a maximum road spacing of 850 feet. Each test would then be repeated at a right angle to the original configuration. Upon completing the sampling, boring holes and test pits would be backfilled, all materials and equipment would be removed, and the surface would be returned to its prior existing condition.

Percolation testing would require an approximately 20 × 30–foot work area at each proposed future septic system or leach field location. The location of percolation testing is dependent on the exact location of septic systems and would be identified following a final Notice to Proceed on the Silver State Solar South project. A truck-mounted drilling rig would use hollow-stemmed auger drilling to bore an approximately 10-inch-diameter hole to the depth of the proposed leach field, typically 3 to 6 feet below grade. Each test hole would then be presoaked by filling the hole with water to a minimum depth of 6 inches, readjusted every 30 minutes for 1 hour. After the initial presoaking period, the hole would be refilled to a depth of 6 inches. Throughout the test, the time and depth of water remaining in the hole would be recorded. Upon completion of the test, the hole would be backfilled with the excavated material.

The total area of disturbance for all components of the geotechnical investigation, including disturbance associated with access, would be 1.9 acres.

2.3 Test Water Well Installation

The installation of up to six test water wells would allow Silver State Solar South, LLC to test the capacity and water quality of the underlying aquifer to assess its potential to meet the project development water demand. The drilling of any well would be approved by the State Engineer and local water district prior to commencement of work. If the aquifer yield is satisfactory, up to three wells would be left in place for the permanent operation of the project as described in the project development plan. However, if the yield is not satisfactory, or if it is determined the well would not be used for project development, or upon BLM request, it would be abandoned and decommissioned in accordance with applicable state and county requirements.

Each well could consist of a single 8-inch-diameter hole drilled to approximately 600 feet below the ground surface. Access to each well site would be on existing roads and washes to the extent possible. Well locations may be moved up to 100 feet in the field to avoid sensitive resources. An approximately 80 × 70–foot work area would be required for drilling activities at each well site. Installation and testing of the wells is anticipated to require 2 to 4 consecutive weeks per well. In order to minimize the amount of disturbance due to collapsing of the pilot hole, well-drilling operations may need to be conducted on a 24-hour basis until the well is established.

Each well would be installed by a State of Nevada certified well driller using specialized well-drilling equipment and a typical direct mud rotary procedure. Equipment anticipated to be used during drilling includes a 600-hp drill rig and 500-hp air compressor. The equipment would only need to travel to and from the site one time for each well location and would remain on-site during the drilling work (subject to

equipment operational issues). In addition to the equipment required for the drilling operations, two pickup truck support vehicles would also be used to access the project site and test well locations daily during the well drilling.

The drill rig would install an 8-inch-diameter well casing to a depth of 600 feet. The top 4 inches of soil would be removed from the work area prior to drilling. The salvaged topsoil would be placed over the work area once well installation is complete. In the direct mud rotary well casing installation method, the bore hole is advanced by rapid rotation of a drill bit mounted on the end of a drill rod. The bit cuts and breaks the material at the bottom of the hole into small pieces, or cuttings. The cuttings are then removed by pumping drilling fluid down through the drill roads and bit, and up the space between the bore hole and drill rods. Drilling fluid may be water, water mixed with bentonite clay, or some other BLM-approved fluid enhancer. The drilling fluid also serves to cool the drill bit, stabilize the bore hole walls, and prevent the flow of fluids into the surrounding earth.

Well construction would include the installation of a steel casing and well screen, cement grout, and cap. As a part of the well installation process, the well would be pumped or agitated using compressed air to remove fine soil material that collects at the bottom of the well within the well careen area. This process would be performed until water flows clear, approximately 8 to 12 hours. All water and fine soil would be discharged to the ground surface. The exact installation materials and procedures required for well installation would be determined by a State of Nevada licensed well driller. All auger cuttings and drilling fluids would be removed from the work site for disposal in accordance with applicable rules and regulations.

At the completion of well development, the well would be pump tested to verify the aquifer capacity. The well would be pumped continuously at the design rate for approximately 24 hours. All water from the pump test would be discharged to the ground surface. When discharged, the test water would be released within the temporary work areas though an energy-dissipating device and straw bale filters or sediment bags, or other methods as determined by Nevada Division of Environmental Protection through the discharge permitting process. Water quality samples would be taken for laboratory analysis.

Upon completion of testing, temporary work areas for each test well would be restored to their prior existing condition with only the wells remaining. The wells would be capped and locked. Up to three wells may be incorporated into the Silver State Solar South permanent facilities. At the request of the BLM, the wells would be properly abandoned in accordance with applicable state and county requirements. Protective measures would be required to protect the wells from damage. These would include placing four 6-inch-diameter steel posts 3 feet into the ground and projecting 3 feet above the ground approximately 3 feet from the well casing.

The total area of disturbance for the installation of test water wells would be 0.77 acre.

2.4 Environmental Resources Protection Measures

Desert tortoise

- A qualified biologist would be on-site throughout the geotechnical investigation, well installation, and testing process to monitor for desert tortoise. If desert tortoises are observed, work would be stopped to allow the tortoise to move out of the area. In case of imminent danger, the U.S. Fish and Wildlife Service (USFWS) would be contacted immediately.

- Desert tortoise awareness training would be provided to all workers/contractors, by the biologist, in a tailgate setting on the first day the worker/contractor is on-site.

- On a daily basis, wildlife escape ramps (slope egress from excavated pits) would be erected in each pit, by the contractor, to allow tortoises to move out of the pit if access is gained (or the pit would be completely backfilled).

- The biologist would inspect under vehicles and equipment for the presence of desert tortoise at the beginning of each work day. Additional inspections would be performed, by the biologist, on all vehicles/equipment that have not moved within 30 minutes, throughout the work day.

Cultural Resources

- If needed, a qualified monitor for cultural resources would be on-site throughout the investigation and any earth-disrobing activities.

3.0 LAND USE PLAN CONFORMANCE

Land Use Plan Name:
Las Vegas Resource Management Plan (LVRMP)

Date Approved/Amended:
October 5, 1998

The proposed action is in conformance with the LVRMP, even though it is not specifically provided for, because it is clearly consistent with the following decision(s) (objectives, terms, and conditions):

Lands Management

Objective

Land Use Authorizations

LD-2. All public lands within the planning area, unless otherwise classified, segregated or withdrawn, and with the exception of Areas of Critical Environmental Concern and Wilderness Study Areas, are available at the discretion of the agency, for land use leases and permits under Section 302 of the Federal Land Policy and Management Act and for airport leases under the authority of the Act of May 24, 1928, as amended.

Management Direction
LD-2-a. Land use lease or permit applications and airport lease applications will be addressed on a case-by-case basis, where consistent with other resource management objectives and local land uses. Special terms and conditions regarding use of the public lands involved will be developed as applicable.

4.0 COMPLIANCE WITH NEPA

The proposed action is categorically excluded from further documentation under the NEPA in accordance with 516 DM2, Appendix I, or 516 DM 11.9,

E. Realty

(19) Issuance of short-term (three years or less) rights-of-way or land use authorizations for such uses as storage sites, apiary sites, and construction sites where the proposal includes rehabilitation to restore the land to its natural or original condition.

J. Other

(3) Conducting preliminary hazardous materials assessments and site investigations, site characterization studies, and environmental monitoring. Included are siting, construction, installation, and /or operation of small monitoring devices such as wells, particulate dust counters, and automatic air or water samplers.

This categorical exclusion is appropriate in this situation because there are no extraordinary circumstances that may significantly affect the environment. The proposed action has been reviewed, and none of the extraordinary circumstances described in 516 DM 2 apply.

1. Have significant impacts on public health or safety.

   No. The proposed action is located in a largely undeveloped area of Clark County; two miles from Primm and up to 40 miles from Las Vegas. There are no private homes located near the proposed project. When the project is complete, all equipment and materials would be removed and the geotechnical investigation sites restored.

2. Have significant impacts on such natural resources and unique geographic characteristics as historic or cultural resources; park, recreation or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (Executive Order 11990); floodplains (Executive Order 11988); national monuments; migratory birds; and other ecologically significant or critical areas.

   No. Resources including special designations are not present.

3. Have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources [NEPA section 102 (2) (E)].

   No. Because of the temporary nature of the proposed project, and the undeveloped location, there would not be any controversial or unresolved conflicts from the proposed action. Geotechnical investigations are routinely authorized by the BLM.

4. Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks.

   No. The project would have no highly uncertain or potentially significant environmental effects. Geotechnical investigations are routinely authorized by the BLM, and the effects of activities associated with geotechnical investigations remain certain.

5. Establish a precedent for future action or represent a decision in principal about future actions with potentially significant environmental effects.

No. The action would not set a precedent for future actions. The effects of the Proposed Silver State South Solar project have been fully analyzed in the Final Supplemental Environmental Impact Statement (FSEIS) for the Silver State Solar South project and Proposed Las Vegas Field Office Resource Management Plan Amendment (BLM 2013).

6. Have a direct relationship to other actions with individually insignificant but cumulatively significant environmental effects.

   No. Although the action is in support of the Silver State South Solar Facility; the effects of the Proposed Silver State South Solar Facility have already been fully analyzed in the Final Supplemental Environmental Impact Statement (FSEIS) for the Silver State Solar South project and Proposed Las Vegas Field Office Resource Management Plan Amendment (BLM 2013).

7. Have significant impacts on properties listed, or eligible for listing, on the National Register of Historic Places as determined by the bureau.

   No. The BLM has determined that this project would cause No Adverse Effect to Historic Properties either directly or indirectly.

8. Have significant impacts on species listed, or proposed to be listed, on the List of Endangered or Threatened Species, or have significant impacts in designated Critical Habitat for these species.

   No. The environmental resource protection measures implemented as part of the proposed action would ensure that no significant impacts to the listed desert tortoise would occur. The proposed action would not result in any loss of designated critical habitat.

9. Violate a Federal law, or a State, local or tribal law or requirement imposed for the protection of the environment.

   No. The proposed action would not result in the violation of any Federal, State, Local, or tribal laws established for the protection of the environment.

10. Have a disproportionately high and adverse effect on low income or minority populations (Executive Order 12898).

    No. The proposed action has been reviewed and no minority or low income populations are known to be present in the area.

11. Limit access to and ceremonial use of Indian sacred sites on Federal lands by Indian religious practitioners or significantly adversely affect the physical integrity of such sacred sites (Executive Order 13007).

    No. The proposed action has been reviewed, and no Indian sacred sites are known to occur in the project area. The proposed action would not limit access to or ceremonial use of Indian sacred sites on Federal lands.

12. Contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of such species (Federal Noxious Weed Control Act and Executive Order 13112).

    No. Should the proposed action be approved, the applicant would be responsible for monitoring and controlling noxious weeds and non-native invasive species. It is not expected that the proposed

action would contribute to the introduction or spread of noxious weeds or non-native invasive species by the following standard weed control stipulations.

5.0 APPROVAL AND CONTACT INFORMATION

Authorizing Official: _____ 1/23/2014
(Signature) **(Date)**

Gayle Marrs-Smith
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