

PMC-EF2a

(20102)

**U.S. DEPARTMENT OF ENERGY
EERE PROJECT MANAGEMENT CENTER
NEPA DETERMINATION**



RECIPIENT: Sierra Geothermal Power Inc.

STATE: NV

PROJECT TITLE : Alum Innovative Exploration Project

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000109	DE-EE0002845	GFO-10-210	GO2845

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), I have made the following determination:

CX, EA, EIS APPENDIX AND NUMBER:

Description:

- A9** Information gathering (including, but not limited to, literature surveys, inventories, audits), data analysis (including computer modeling), document preparation (such as conceptual design or feasibility studies, analytical energy supply and demand studies), and dissemination (including, but not limited to, document mailings, publication, and distribution; and classroom training and informational programs), but not including site characterization or environmental monitoring.
- B3.1** Onsite and offsite site characterization and environmental monitoring, including siting, construction (or modification), operation, and dismantlement or closing (abandonment) of characterization and monitoring devices and siting, construction, and associated operation of a small-scale laboratory building or renovation of a room in an existing building for sample analysis. Activities covered include, but are not limited to, site characterization and environmental monitoring under CERCLA and RCRA. Specific activities include, but are not limited to:
- B5.1** Actions to conserve energy, demonstrate potential energy conservation, and promote energy-efficiency that do not increase the indoor concentrations of potentially harmful substances. These actions may involve financial and technical assistance to individuals (such as builders, owners, consultants, designers), organizations (such as utilities), and state and local governments. Covered actions include, but are not limited to: programmed lowering of thermostat settings, placement of timers on hot water heaters, installation of solar hot water systems, installation of efficient lighting, improvements in generator efficiency and appliance efficiency ratings, development of energy-efficient manufacturing or industrial practices, and small-scale conservation and renewable energy research and development and pilot projects. The actions could involve building renovations or new structures in commercial, residential, agricultural, or industrial sectors. These actions do not include rulemakings, standard-settings, or proposed DOE legislation.

Rational for determination:

Sierra Geothermal Power, Inc. (SGP) would perform an exploration and drilling case study of the Alum geothermal resource. The goal of this project is to reduce the level of risk during the early stages of geothermal project development and to determine the combination of techniques that are most useful and cost-effective in identifying the geothermal resource.

The project is divided into three phases with multiple tasks:

Phase 1: Resource Evaluation

1. Surface and near surface investigations

- 1.1. Airborne thermal and hyperspectral imaging surveys to identify surface thermal anomalies.
- 1.2. Make shallow (6 ft) temperature probe measurements to validate surface thermal anomalies identified in 1a.
- 1.3. Drill five shallow (up to 1000 ft) temperature gradient holes to test whether the aforementioned thermal/mineral surveys can identify areas with high temperature gradients.

2. Build 3D conceptual model

- 2.1. Collect magnetic susceptibility (using a handheld meter) and density data (using Archimedes principle) on samples of representative rock units in the Silver Peak area for the model.
- 2.2. Create ten 2D geologic cross-sectional models that are constrained by both magnetic and gravity data and surface geology. The 2D models would be used as input for the creation of a 3D model.
- 2.3. Test and assess the accuracy of the 3D model predictions by comparison to proprietary 2D reflection and refraction seismic profiles that were conducted separately from this proposal.

3. Conduct a ground-based magnetotelluric (MT) survey complemented with an airborne Z-tipper Electromagnetic (ZTEM) survey to create a 3D resistivity model.

4. One exploration well would be drilled to 3200 feet with a rotary rig and deviated from vertical to obtain geomechanical information and characterize vertical fractures. Various downhole logging and sidewall coring would be conducted to characterize lithologies.

5. One coiled-tube slimhole well and one core slimhole well would be drilled, each up to 7000 feet in depth. This allows for direct comparison of the two drilling methods. Various downhole logging would be completed for each well.

6. Integration of the various exploration datasets into one coherent geothermal model.

7. Write Phase 1 report; go/no-go decision point.

Phase 2: Drilling

- 8. One production well would be drilled and logged to a depth of up to 8000 feet.
- 9. Analyze the data from the production well to incorporate into the 3D model and write the Phase 2 report.

Phase 3: Well Testing

- 10. Conduct extended flow test on the production well then interpret the flow test results to integrate into the 3D model of the geothermal system.
- 11. A copy of the data and models would be provided to an independent expert to estimate the MWe capacity of well production and overall size of the geothermal reservoir.
- 12. Assess the efficacy of the innovative exploration methods.
- 13. Write the Final Report
- 14. Project Management and Reporting

Reports and other deliverables will be provided in accordance with the Federal Assistance Reporting Checklist following the instructions included therein.

Field work for this project would be completed at the Alum site in Esmeralda County, Nevada. Most analytical work would be completed at SGP's offices in Reno, NV and Olympia, WA. Several independent laboratories would be used to complete laboratory analysis of samples collected at the project site. All parties have completed R&D Laboratory Questionnaires and appear to have adequate safety policies and procedures in place.

The Bureau of Land Management (BLM) has jurisdiction as the surface management agency for the project. The BLM completed an EA (DOI-BLM-NV-B020-2009-0016-EA) on May 22, 2009 and a Decision Record/FONSI was signed on July 21, 2009.

Tasks identified in the Statement of Project Objectives (SOPO) submitted to the DOE were compared to what was analyzed in the EA completed by the BLM to determine if those tasks were adequately addressed in the EA. Potential surface disturbing activities identified in the SOPO (temperature gradient, exploration, slimhole, and production wells, and geophysical survey) were analyzed in the EA either as part of the Proposed Action or as part of the Reasonably Foreseeable Future Actions. The exploration well, slimhole wells, and the production well identified in the SOPO were analyzed in the EA under the more inclusive term of large diameter observation wells. It is not unusual for the term observation well to be used to describe exploration wells or slimhole wells, and large diameter observation wells could be used as production wells. Based upon the comparison of the SOPO to the EA, it has been determined that the EA sufficiently analyzes the environmental impacts of the tasks identified in the SOPO, therefore the DOE is in agreement with BLM's FONSI.

This project is comprised of information gathering, data analysis, document preparation, geophysical surveys for site characterization, and actions to conserve energy through small-scale renewable energy research and development, therefore this project is categorized into CX A9, B3.1, and B5.1.

NEPA PROVISION

DOE has made a final NEPA determination for this award

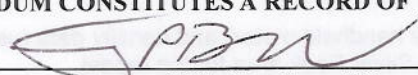
Insert the following language in the award:

Note to Specialist :

None Given.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:


NEPA Compliance Officer

Date:

3/18/10

FIELD OFFICE MANAGER DETERMINATION

- Field Office Manager review required

NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:

- Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
- Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.