STATEMENT OF PROJECT OBJECTIVES
GeoGlobal Energy LLC
Recovery Act: Away from the Range Front: Intra-basin Geothermal Exploration

A. PROJECT OBJECTIVES

GGE proposes to use an innovative combination of existing technologies from other industries to locate upflow along faults oriented to be highly permeable at the Gabbs Valley geothermal prospect. The exploration project is designed to provide cost-effective results by lowering the costs and increasing the available data using proven techniques from other industries designed and run by a team that has very extensive geothermal exploration experience. These low-cost techniques are ideal for exploration of buried intra-basin geothermal systems such as Gabbs Valley and many other under-explored areas of the Basin and Range. The project and ensuing resource development will create employment opportunities including both short-term and permanent jobs. The project includes cooperation with the University of California in Santa Barbara to transfer knowledge between academia and industry.

B. PROJECT SCOPE

Perform geomechanical surveys during surface exploration (Phase 1), to target sites for two stages of deep exploration drilling (which will be conducted in Phase 2), and to perform extended well tests (Phase 3). The NOI submitted to BLM July 1, 2010 is to address the Phase 1 activities only. An airborne Light Detection And Ranging (LiDAR) survey will be performed over the prospect area to identify offset from recent seismicity and target a high-density program of low-cost shallow holes. The holes will provide temperature gradients, stress field measurement from overcoring, fluid samples from a shallow aquifer, and lithologic information. The LiDAR and lithology data will support selection of sites for shallow trenching across the faults. Trench and surface mapping will provide information on active deformation including fault dips. These data will be augmented with a low-cost laser strain trilateration network across the prospect area to provide baseline for measurements of active deformation. The fluid samples will be analyzed for fluid isotopes and dissolved chemistry to help track down the upflow zone. This dense but low-cost data set will be integrated into a conceptual geomechanical -hydrothermal model of the system and applied to target two slim holes. The slim holes will be drilled in Phase 2 of the project, after the appropriate environmental field work and approvals have been obtained from BLM and other agencies. They will be logged using density and borehole image tools to support development well targeting. The wells will be tested to demonstrate discovery.

C. TASKS TO BE PERFORMED

PHASE 1 RESOURCE EVALUATION

Task 1.0 LiDAR Survey, Interpretation and Field Verification

Subtask 1.1 LiDAR SURVEY

LiDAR surveys involve airborne scanning laser ranging of the earth surface to provide very precise and detailed topography. The precise topography returned by these surveys allows
quantification of recent small-scale fault displacements over a large area. The LiDAR survey will be flown over the prospect area and adjacent areas of fault offset. This survey is designed to resolve relative offsets as small as 1 cm in measurements with 1 m spacing.

**Subtask 1.2 LiDAR Interpretation and Field Verification**

LiDAR data interpretation will be completed. Field verification will involve geologic traverses to observe offsets and geomorphic features associated with active tectonism. Interpretation will place this area in the context of published work along the active fault zone to the north.

**Task 2.0 Contracting and Permitting**

All contractors will be properly licensed. All work will be properly permitted and permits will be obtained in advance from all necessary government agencies.

**Task 3.0 Over-Coring Stress Measurement**

Overcoring releases the stress on a rock by coring around it. The response of the rock is observed using a strain meter and stress is then calculated from rock elasticity. Over-coring stress results will help locate which portions of the fault system are oriented to fail and therefore likely to be permeable. Current stress orientations will be mapped across the project area on all sides through drilling and over-coring of outcropping Tertiary-age sedimentary and volcanic rocks. Holes will be cored for this purpose. Although these overcore holes will be targeted outside of the heat anomaly, they will be temperature logged and any fluid encountered will be sampled and analyzed for general chemistry parameters.

**Task 4.0 Direct-Push Drilling Program**

**Subtask 4.1 Direct-Push Drilling**

A Direct-Push (DP) drilling contractor will drill boreholes over part of the prospect area. These DP wells will be installed quickly and cheaply compared to traditional auger or reverse-circulation (RC) drilling techniques. These holes will be deep enough to dampen the seasonal as well as the diurnal temperature fluctuations, providing accurate temperature measurements along with water chemistry while maintaining low cost.

**Subtask 4.2 Water Sampling, Analysis and Interpretation**

Water samples will be taken from each DP well and sampled for helium isotope, oxygen isotope, major ions and temperature. The analytical results will be interpreted for locating the region of high-temperature upflow.

**Subtask 4.3 Temperature Logging and Interpretation**

Each well will be logged with a downhole temperature data logger for calculation of thermal gradient and mapping of shallow temperature.

**Subtask 4.4 Core Logging**

The soil core from each DP well will be carefully logged for identification and correlation of marker beds. Offset in these beds between wells will allow for mapping of buried fault traces.
Subtask 4.5 Surveying
After completion of the DP drilling a licensed surveyor will survey the well locations and elevations to within a small precision and relative to a geodetic survey marker. This will allow marker beds to be correlated between soil cores.

Task 5.0 Fault Zone Strain Mapping
Subtask 5.1 Trenching
LiDAR, field mapping, and push core logs will be used to design trenches to be dug across the recent faults in three locations to determine the fault dips and the extent and history of movement. Soil horizons will be dated using Carbon-14 analyses.

Subtask 5.2 Laser Trilateration Strain Network
Active deformation in the prospect will be quantified by installation of a network of 10 simple benchmarks within line-of-sight across the fault zone. A survey of lateral distances between the benchmarks using a bi-color laser ranging device will provide baseline data. The initial survey will be repeated prior to slim hole targeting. The value of the baseline will increase with time and may provide more effective support prior to targeting development wells.

Task 6.0 Conceptual Model Development
Results from the above exploration programs will be integrated into a conceptual model of the reservoir from which it will be possible to identify a probable location for the high-temperature liquid upflow along permeable fault segments. The conceptual model will include a deep heat source, recharge, temperature contours, convective fluid flow, and lithology as context for structure and upflow. Upon targeting the well a decision will be made whether to proceed to deep drilling.

Task 7.0 Well Targeting
A slim hole will be targeted to discover the upflow zone. Upon targeting the well a decision will be made whether to proceed to deep drilling.

Task 8.0 Phase One Reporting
A report will be submitted to the U.S. Department Of Energy at the completion of Phase 1 which will contain the results of the LiDAR work, field mapping and push core logs. It will also provide results of the soil horizon Carbon-14 dating analyses and slim hole targeting as discussed above in Task 7.0. Other U.S. DOE reporting requirements include a quarterly progress report.