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Quarterly Progress Report

DOE Instrument DE-FG07-97ID13532 Determination of Silica Scale Deposition Rates and Thresholds Applied Toward Protection of Injection Reservoirs

Reporting Period: August 1, 1997 through December 31, 1997

Progress This Period

The project was initiated in mid-August when GDA issued a formal notice to proceed to our consultant, Dr. Donald Michels.

Final design work was performed in late August and early September. Instrumentation and the components required for the probe and reactor assemblies were procured. Probes were fabricated and tested to assess their sensitivity to scaling.

In October, the focus was on design and fabrication of the reactors. This required close coordination with welding and machine shop subvendors. Contact was made with the two Nevada power plants where the experimental equipment will be field tested. Each has indicated their support for the project and will accommodate our field testing efforts.

Lab testing of the components in November determined that a probe sensitivity problem existed. Dr. Michels worked with GDA's electrical engineer, David Mendive, to quantify the problem and to outline possible courses of action. It was decided to request the specification for the materials used by the Costa Rican utility for pipelines and vessels at Miravalles. By building the probe assemblies from these same materials, experimental results would not be subject to the question of whether preferential scaling occurred due to a specific probe material. Also, both electrodes in the probe were made from the same material in the hope of reducing galvanic effects caused by dissimilar metals, which could be contributing to the sensitivity problem.

In December, new probes were manufactured using the same material as the steel pipelines at Miravalles. Electrical problems still existed, however, probably due to the type of excitation used to monitor the scaling effects. Signal conditioning was added between the probe and recorder to convert from direct current to alternating current excitation. This eliminated additional galvanic effects which may have been masking changes in the signal caused by scale formation.

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Sensitivity problems, although greatly reduced, were not yet fully eliminated. Dr. Michels and Mr. Mendive will continue to review apparatus grounding and shielding design in January, 1998, in an effort to reach the desired probe sensitivity required by this study.

Schedule

The work of design and final assembly was anticipated to take two months. However, the probe sensitivity problem has added approximately three months to the schedule.

Budget

GDA has charged \$6,068 in project management and engineering assistance to the study, which represents about 12.5% of GDA's total portion of the budget. Dr. Michels has charged \$11,150 so far to the study, which represents about 19% of his total portion of the budget. It was anticipated that Dr. Michels would charge \$10,300 for his labor to design and assemble the components. The budget for materials and components was estimated at \$15,980. Less than \$3,000 was spent during this first reporting period for materials and components.

Anticipated Work in First Quarter of 1998

Both GDA and Dr. Michels are confident that the sensitivity problems can be reduced to a manageable level. The current schedule calls for Dr. Michels to arrive in Reno, Nevada, on February 12, 1998, to begin field testing. It is hoped that the field testing in Nevada will allow the final configuration of the components and instrumentation to be determined, so that there will be no unforeseen problems when the testing in Costa Rica commences.

Respectfully submitted,
GEOTHERMAL DEVELOPMENT ASSOCIATES

G. Martin Booth, III Date 1/26/98
President

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