

cc JFC AD PRC
Andy [unclear]



Idaho National Engineering Laboratory

May 5, 1987

Chandler Swanberg
GEO Operator Corporation
1825 South Grant Street
Suite 900
San Mateo, CA 94402

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MAY 8 1987
GEO Santa Rosa

COOPERATIVE FIELD TESTING AT EAST MESA - SGS-20-87

Dear Chan:

As we discussed today, I am enclosing a copy of the agreement between Magma Power Co. and the Department of Energy regarding cooperative field tests at East Mesa. The agreement delineates the responsibilities each party had for the research tasks identified. You will note that the agreement expired last Saturday (a surprise to me, since I still think it's March...). This agreement is relatively easy to work through the DOE system since it does not involve any transfer of money. I will check with DOE to see if the agreement can be readily extended, and reassigned by Magma if necessary, and let you know as soon as I get an answer.

DOE has provided \$215,000 to support the research identified in the agreement. This funding has been distributed to the research participants and, with the exception of some funding for interpretation of well logs, has been held in reserve by the labs and universities. As the agreement indicates, GEO would be basically responsible for field operations if you assumed this arrangement. The only funding requirement discussed with Magma under this agreement was potential funding for a VSP survey.

I am currently checking on the availability of personnel to support research associated with your planned production-injection test and will let you know as soon as possible if we think we can meet your schedule. I would suggest that you consider non-isothermal injection testing and an injection-backflow test with tracers to evaluate fluid migration, heat transfer and rock-water interactions. You may want to review the proposals I gave you for any additional research that may be of interest to you for this test. Other proposed research, such as the tracer breakthrough tests and SP survey, could be conducted later.

Due to the short schedule, I assume our earlier agreement to talk on the 21st is no longer appropriate, and I will call you later this week. If you have any questions, please don't hesitate to call me.

Sincerely,

Susan G. Stiger
Renewable Energy Programs

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SAN MATEO

THIS AGREEMENT, entered into this 2nd day of May, 1986, by and between the UNITED STATES OF AMERICA (hereinafter referred to as the "Government"), represented herein by the UNITED STATES DEPARTMENT OF ENERGY (hereinafter referred to as "DOE") and Magma Power Company (hereinafter referred to as "Magma"), a corporation organized and existing under the laws of the State of California;

WITNESSETH THAT:

WHEREAS, DOE requires support from Magma for DOE's injection research program, and Magma is willing to provide this support through experiments at Magma's East Mesa geothermal well field;

WHEREAS, the objective of the injection research is to test the application of new pressure transient, tracer and geophysical methods in the field and to provide a data base to validate the use of new numerical simulation techniques being developed as part of DOE's Geothermal Injection Technology Program;

WHEREAS, the role of DOE in this program is to sponsor research activities to be conducted by DOE contractors at Magma's East Mesa geothermal field. These research activities will include field surveys and data collection, data analyses, numerical simulations and the development of conceptual resource models;

WHEREAS, the role of Magma is to provide existing data to DOE in support of the research activities, to provide access to its wells and facilities at East Mesa for the field activities, to provide labor and material support as required for the DOE field activities, and to participate in the data analysis and interpretation.

WHEREAS, DOE, under the Department of Energy Organization Act (P.L. 95-91) and pursuant to its authority to enter into contractual arrangements with non-Federal participants under Section 7(a)(2) of Public Law 93-577 and Sections 103(2) and 107(a) of Public Law 93-438 has determined DOE should enter into a mutually beneficial research program with Magma;

NOW, THEREFORE, DOE and Magma agree as follows:

1. Research Scope and Responsibilities

a. Non-Isothermal Transient Tests

DOE will participate in pressure transient tests of existing and new injection wells in the East Mesa field. DOE will provide Magma with instructions on how to conduct such tests and will participate in the data collection activities.

Special instrumentation for data collection will be provided by DOE for the period of the transient tests. Analysis of the data will be provided by DOE.

Magma will provide to DOE all available data on well construction and lithology. Magma will be responsible for conducting the transients tests in accordance with the guidelines provided by DOE. Magma will provide field labor, materials and equipment required for the tests and will provide labor for long-term monitoring, as required.

b. Tracer Tests

DOE will conduct single-well or well-to-well tracer tests to provide a basis for predicting thermal breakthrough in the East Mesa reservoir. DOE and Magma will participate in the selection of the appropriate well(s) for the tracer tests. DOE will prepare and provide to Magma a test plan which will detail the test requirements and schedule. DOE will provide personnel to support the design of the tracer injection system and the tracer injection. DOE will provide Magma with a sampling schedule and will perform non-routine chemical analyses of the samples as required. DOE will perform analyses of the tracer data, should tracer breakthrough occur.

Magma will provide field labor, materials and equipment in support of the tracer injection and for collection of fluid samples from the wells. Magma will participate in and approve the final design for the tracer injection system to ensure compliance with safety and facility design requirements. Routine screening of the fluid samples will be provided by Magma if within the capabilities of Magma's analytical facilities.

c. Geophysical Surveys

DOE and Magma will develop a geophysical survey program to be implemented at East Measa to evaluate the application of new survey and analytical techniques in defining geothermal anomalies. The scope of this activity will include review of existing geophysical data available to Magma and DOE, and field surveys (e.g., VSP, SP) as identified in the approved geophysical survey program. Additional surveys will be selected based on the results of the conceptual model development (item 4 below) and the review of existing geophysical data. DOE will be responsible to conduct the surveys and will provide data analyses. Magma will provide field support and equipment support, as required, for the surveys.

d. Conceptual Geologic Model

DOE will collate and review all existing geologic, geochemical and geophysical data related to the East Mesa geothermal field. The objective of this activity will be to develop a conceptual resource model based on new data interpretations.

Magma will provide DOE with all applicable data at their disposal to support the development of the conceptual model. Magma will participate in the review of the conceptual model.

2. DOE Contractor Personnel

DOE Contractor personnel shall be required to observe all rules, regulations and requirements of, or applicable to, Magma personnel and contractors including, but not limited to: security, safety, health, hours of work and conduct, as specified by Magma for its East Mesa facility.

Magma may request the recall of any DOE Contractor personnel when deemed appropriate. In such event, arrange for immediate recall of that person and may substitute another qualified research person.

3. Disclaimer of Warranty

Neither the Government, DOE, nor persons acting on behalf of DOE makes any warranty or other representation, express or implied, with respect to the accuracy, completeness or usefulness of any information furnished hereunder that the use of any such information may not infringe privately-owned rights; that the services, materials, or information furnished hereunder will not result in injury or damage when used for any purpose; and that the services, materials or information furnished hereunder will accomplish the intended results or are safe for any purpose including the intended purpose.

4. Rights in Information

DOE and Magma shall have the right to use any information produced in connection with or as a result of the work hereunder for any purpose. Unless specifically prohibited by Magma, DOE may separately and independently publish or otherwise disclose any and all results of, or data, material or other information generated by or through the work under this Agreement.

5. Liability

Each party is individually responsible for the actions of its officers, agents and employees arising out of work under this Agreement.

6. Assignment

Neither this Agreement nor any interest therein nor claim thereunder shall be assigned or transferred by Magma, except as expressly authorized in writing by DOE.

7. Officials Not to Benefit

No member of, or delegate to, Congress or resident commissioner shall be admitted to any share or part of this Agreement or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this Agreement if made with a corporation for its general benefit.

8. Covenant Against Contingent Fees

Magma warrants that no person or selling agency has been employed or retained to solicit or secure this Agreement upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide established commercial or selling agencies maintained for the purpose of securing business. For a breach or violation of this warranty, DOE shall have the right to annul this Agreement without liability.

9. Examination of Records by Comptroller General

Magma agrees that the Comptroller General of the United States or his duly authorized representative shall have access to, and the right to, examine any directly pertinent books, documents, papers and records of Magma involving transactions related to this Agreement until the expiration of three (3) years after completion of work under this Agreement, unless DOE authorizes their prior disposition.

10. Term

The term of this Agreement shall be twelve months from its effective date unless sooner terminated by 30 days' written notice from either party.

11. Termination

- a. This Agreement may be terminated by either party at any time provided written notice of termination is received at least thirty (30) calendar days prior to the date specified in such notice as the date upon which such termination shall become effective.
- b. DOE may terminate this Agreement at any time with no notice to Magma for failure of Magma to comply with requirements of this Agreement.

12. Notices

Any notices or other communications required or permitted to be given or delivered hereunder shall be in writing and shall be sufficiently given if delivered personally or sent by first-class mail, postage prepaid, to the following:

For Magma:

Tom Hinrichs
Magma Power Company
993 Oak Lane
Escondido, CA 92025

For DOE:

J. O. Lee, Contract Specialist, R&D Contracts Branch
Idaho Operations Office
U. S. Department of Energy
785 DOE Place
Idaho Fall, ID 83402

or such other addressees as either party may from time to time designate to the other in writing, and such notice or other communication shall be deemed to be given as of the date it was personally delivered or deposited in the mail, as the case may be.

13. Publicity Releases

No publicity releases (including news releases and advertising) relating to this Agreement and work hereunder shall be issued by either party without the prior written approval of the other party. Such approval shall not be unreasonably withheld.

14. No Interference With Magma Operations

Nothing in this Agreement is to construe that any operations under the Agreement will have priority over the normal operation and maintenance of Magma's facilities.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the day and year first above written.

UNITED STATES OF AMERICA

BY THE U.S. DEPARTMENT OF ENERGY

By J. C. Lee
Title Contracting Officer
Date 5-2-86

MAGMA POWER COMPANY

By _____
Title _____
Date _____