DEPARTMENT OF GEOLOGY AND GEOPHYSICS

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1 Sept. 1977

State-Coupled Direct Heat Program, Western States

Task Descriptions

Task 1. Phase Zero Study

Objectives: to define objectives, tasks and milestones for this project and to assign priorities.

Background: DGE's objective in this project is to facilitate discovery, assessment and development of low temperature geothermal resources in the United States. One strategy for reaching this objective is the initiation with selected states of cooperative programs entitled "(State Name) Low Temperature Geothermal Reservoir Assessment and Confirmation Cooperative Program". These programs are governed by agreement among ERDA, one or more state agencies, the U.S. Geological Survey, and the U.S. Forest Service and/or Bureau of Land Management. The objectives of these state cooperative programs are:

1. To extend the inventory of geothermal resources in the state to include the low temperature reservoirs most suitable for direct heat applications; and
2. To stimulate reservoir confirmation studies at sites with an apparent but unquantified potential for direct heat application development.

The basic time-frame for DGE's project is 2 1/2 years.

This project, the State-Coupled Direct Heat Program, Western States (DH) operates under DGE's Reservoir Assessment State-Coupled Program

(RASCP). The objectives of DH are:

1. To aid DGE in managing their cooperative state programs and to help ensure that program goals are met;
2. To provide technical expertise to state programs as requested by the individual project managers; and,
3. To improve the general and specific level of understanding of low temperature geothermal resources in the western United States.

These three goals will be accomplished by completing tasks 1-10 specified herein and by completing independent, goal-oriented technique development.

Tasks: Specific project tasks defined by this Phase Zero Study are listed below.

Task 2. Establish Internal Management Scheme

Objective: to design and provide project management which a) establishes a project working group, b) ensures that project tasks are completed and that project objectives are achieved within the required time frames, and c) establishes a formal oral and written reporting procedure.

Background: The current management structure of the Earth Science Laboratory University of Utah Research Institute (ESL) is shown in Figure 1. Line management of DH will conform to this structure.

The project management of DH is specified in Figure 2. The main project working group will be ESL staff and managers. Talent will be drawn from the Department of Geology and Geophysics of the University of Utah at the discretion of the PI.

Tasks: Specific management tasks, in addition to those listed in more detail elsewhere, include:

- 2.1 Maintain active communication and liason with DGE.
- 2.2 Provide technical service to DGE on low temperature geothermal reservoir assessment and confirmation at request.
- 2.3 Ensure cooperation of ESL with various state and federal agencies involved.
- 2.4 Identify voids in DH and in DGE's geothermal energy program and make written recommendations and/or proposals for independent research to DGE.
- 2.5 Provide liason with the USGS, USFS and BML as necessary.

Task 3. Establish Information Documentation Scheme

Objectives: to provide processing, cataloging, cross referencing, open file accessing, and archival storage of data, documents, books and maps generated under DH.

Background: A central library facility is needed where ESL users and outside users from industry, government, private interest groups, and other institutions can easily obtain and study reference material related to discovery, assessment, and utilization of geothermal resources. Our intention is to establish and make available such a facility in our office. This library will house not only data generated through this project, but it will also house background technical information specified in Task 4 and geothermal information compiled under other projects.

Tasks:

- 3.1 Establish drawer and shelf library files with cross referenced card catalogues and data, and flat or hanging files for maps and large format information.

- 3.2 Set up microfiche and microfilm files with readers and printers.
- 3.3 Establish information control and check-out procedures.
- 3.4 Establish open-file library facilities for non-DH project staff users.
 - a) Set up separate open-file card catalogues to protect proprietary information.
 - b) Establish copying mechanisms and costs for non-DH users.
- 3.5 Microfilm or microfiche and file one-of-a-kind documents, data, and maps.

Task 4. Assemble Background Technical Information and Worldwide Case History Reference Base

Objective: to create a comprehensive, easily useable reference base for comparison with data generated by this project and for future use.

Background: This information reference base will be important for comparison and interpretation of data generated by this project and will form an important part of the open-file library facilities specified under Task 3. Material to be assembled include (at minimum):

- (1) A comprehensive reference base on geothermal resources in the following topic areas:
 - a) occurrences, especially in the U.S.
 - b) exploration for geothermal resources,
 - c) assessment of geothermal resources.
- (2) A general, less comprehensive, reference base in at least the following topic areas:
 - a) utilization of geothermal resources,
 - b) current geothermal projects, agencies, people,

- c) energy resources in general (nature, occurrences, economics),
- d) disseminated mineral deposits (paleogeothermal systems),
- e) volcanology,
- f) geopressured geothermal resources,
- g) problems and techniques of drilling in geothermal environments.

Tasks:

- 4.1 Obtain geothermal and other pertinent bibliographies through purchase or search of computer-based bibliographies such as GEOREF, ENERGY LINE, NTIS.
- 4.2 Select desired information from bibliographies.
- 4.3 Assemble and file selected literature by copying from journals, purchasing texts, purchasing microfiche.
- 4.4 Assemble and file data, maps and reports generated by this project.
- 4.5 Obtain and file copies of geothermal reports from other laboratories, institutions, government agencies, and companies.
- 4.6 Subscribe to pertinent journals.
- 4.7 Solicit and file previously unpublished information from government agencies, laboratories and companies.
- 4.8 Solicit and file information from foreign countries which have active geothermal projects.
- 4.9 Compile information on people working in geothermal energy, affiliations, projects, companies, research labs, academic institutions, government agencies, contractors, and consultants.

Task 5. Establish Core and Cuttings Sample Library

Objectives: 1) to provide cataloging, open file accessing, and archival

storage of core and cuttings samples from geothermal holes drilled with DGE funding under this and other projects and 2) to provide sample abstracting, compositing, washing, and preparation.

Background: Samples of core and cuttings which result from DGE-funded geothermal drilling are a valuable resource for future examination, comparison and research. A central storage facility, open for use by industry, government agencies, academic institutions and others is desirable in promoting geothermal discovery, assessment and utilization research. Non-returnable samples would be provided, at DGE's discretion, for research at other laboratories.

Tasks:

- 5.1 Establish a core and cuttings sample library.
- 5.2 Equip the sample library with sample washing and preparation equipment and with a binocular microscope.
- 5.3 Establish an open-file capability for sample examination and rules for outside users to obtain non-returnable samples.
- 5.4 Create abstracts of samples for easy examination and for exchange with other sample storage facilities.
- 5.5 Create sample composites of selected holes for analysis.

Task 6. Convert Information Control to In-House Computer Retrieval Format

Objectives: 1) to store location data on material housed in our files and in our core/cuttings library for easy access and card catalogue updating, and 2) to provide key-word search capability for information in our files.

Background: Because of the comprehensive nature of our proposed geothermal files, a computer-based retrieval capability is desirable. This will

provide an economic and versatile way to quickly locate information, to locate core and cuttings samples, to update card catalogues, and to provide key-word search of in-house information.

Tasks:

- 6.1 Write a computer program to store and access information on file location of specific documents, data, maps, and core and cuttings samples.
- 6.2 Write or otherwise obtain a key-word search program to search documents, data or maps in our files for specific information desired by topic, area or data type. Enter key words as specified on other computer bibliographies such as GEOREF.
- 6.3 Provide search/retrieval of above computer files as a service to non-DH users at cost.

Task 7. Aid DGE in Establishing Cooperative State Programs

Objectives: On a state-by-state basis as specified by DGE, to establish current extent of knowledge of low temperature geothermal resources, to identify available expertise in state agencies, and to determine approach and work remaining to be done to enable DGE to meet the objectives of RASCP.

Background: Knowledge and documentation of low temperature geothermal resources varies considerably from state to state. Some states have or have had active assessment programs whereas others have not. In some states expertise and facilities currently exist which will allow DGE to attain its low temperature geothermal objectives, whereas in other states appropriate expertise and talent do not exist. The current status of work accomplished in assessing low temperature geothermal resources,

state and/or federal agencies having talent and authority to do so, and work remaining need to be assessed before DGE can formulate a meaningful state cooperative program.

Tasks:

- 7.1 Determine current information and knowledge base of low temperature geothermal resources by making personal, written and telephone contacts at appropriate levels in state and federal agencies as advised by DGE.
- 7.2 Determine expertise available in various state agencies and in the USGS-WRD for accomplishing the objectives of RASCP.
- 7.3 Determine an appropriate approach for design of a cooperative state program which will accomplish the objectives of RASCP as specified under Task 1 (to be done interactively with DGE).

Task 8. Provide Consulting Expertise to Cooperative State Programs

Objective: to aid in data compilation acquisition, verification, and in report writing and map making.

Background: Not all of the states will have adequate or appropriate expertise or facilities either in state agencies or in the USGS-WRD to accomplish the objectives of RASCP. ESL will supplement and complement the personnel and facilities assigned to the cooperative state programs at the request of the state project manager.

Tasks:

- 8.1 Provide technical consulting expertise to the various cooperative state programs as requested by the individual project managers and as approved by DGE. Geothermal data interpretation will be

accomplished using interpretation capabilities being developed under the Case Studies projects at ESL.

8.2 Monitor progress on each state program and advise DGE.

8.3 Help with logistics of each cooperative state program such as data compilation, report preparation and publication, map publication, others.

Task 9. Provide Advice to Developers of Low Temperature Geothermal Resources

Objective: to facilitate discovery, assessment and utilization of low temperature geothermal resources by providing technical advice to private groups and companies.

Background: Many private groups and companies are assessing the possibility of using low temperature geothermal resources to help alleviate increasing energy costs. They may require help and advice in submitting proposals to DGE. We will strive to provide this technical help to the extent of our ability to ensure more rapid development of geothermal resources. Lists of available contractors and consultants will be provided to those seeking further help.

Tasks:

9.1 Provide technical consultation on proposal writing and other problems where requested by outside private groups and with notification of same to DGE.

Task 10. Write and Distribute Reports

Objective: to document progress and results of this project.

Tasks:

10.1 Write and distribute reports as required by DGE.

DH PROJECT MANAGEMENT STRUCTURE

formal reporting, second priority -- day-to-day letters, memos
phone conversations, first
priority reporting at need.

Figure 1. Earth Science Laboratory - University of Utah Research Institute

MANAGEMENT STRUCTURE

1. Executive Committee
 - a) Composed of project managers
 - b) Formulates ESL policy (with Director)
 - c) Monitors work progress with attention to high technical quality, attainment of project objectives.
2. Associate Director
 - a) Responsive to decisions of Executive Committee
 - b) Responsible for personnel, facilities management.