GL00817

GeoProducts

MANAGEMENT PLAN

AND

MILESTONE REPORT

for

The Honey Lake Geothermal Project

Submitted to

The U. S. Department of Energy

Idaho Operations Office

March 31, 1981

GEOPRODUCTS CORPORATION, 1330 BROADWAY, OAKLAND, CALIFORNIA 94612 (415) 893-8365

INTRODUCTION

This Management Plan and Milestone Report pertaining to the Honey Lake geothermal exploration and development program is submitted in accordance with Task 1 (Appendix B) of the GeoProducts/US DOE Cooperative Agreement DE-AC07-81ID12262.

PROJECT ORGANIZATION AND MANAGEMENT

The organization chart shown in Figure 1 outlines the organizational structure proposed for this project. This arrangement was selected as a framework to insure cost effective project management, clear delineation of authority/responsibility and technical advisory functions, and to take full advantage of efficiencies resulting from other parallel project efforts. The small size of the project team provides for direct and effective control of all project activities.

Program Director. The Honey Lake Program Director for GeoProducts Corporation is Kevin Johnson. Mr. Johnson will be responsible to the U.S. Department of Energy - Idaho Operations Office for work performed under the above referenced cooperative agreement. He is also responsible to other project participants, primarily the California Department of Water Resources and the U.S. Department of Agriculture - Forest Service, through separate agreements. The Program Director will review all actions recommended of the Project Manager, including all contracts, applications, permits, costs, payments, and will provide overall policy guidance for the project. Mr. Johnson has been responsible for

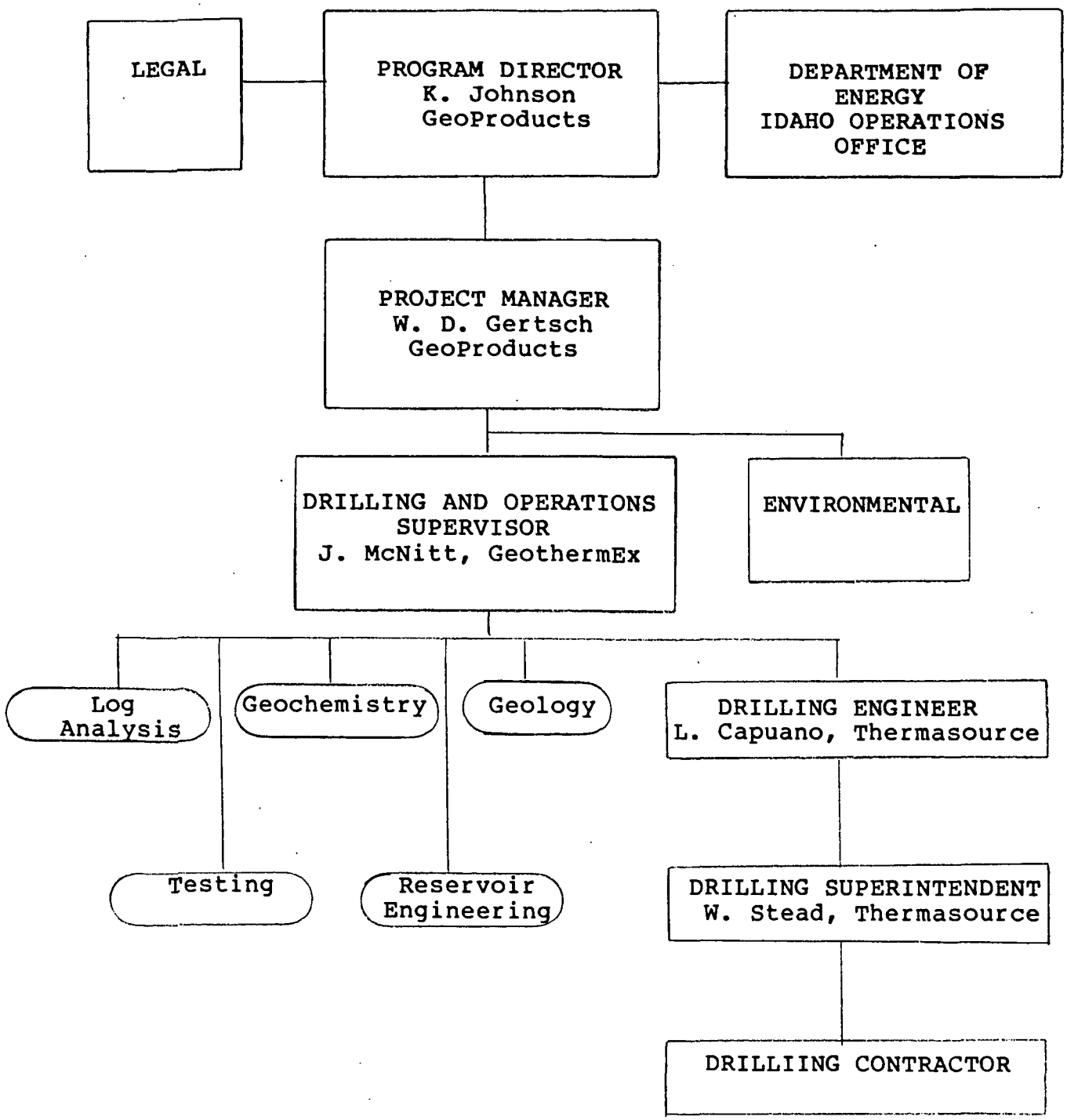


Figure 1. Project Organization

the technical guidance and direction of work performed to date on the project, including the wood fuel analysis, thermal gradient drilling, geophysical data evaluation, engineering feasibility, and environmental assessment.

Project Manager. General program and policy guidance will be provided from the Program Director to the Project Manager who will be responsible for day to day project operations including review of subcontractor qualifications, accounting, acquiring permits and licenses, keeping the Program Director informed on all project activities, and communication with all outside parties. The Project Manager will also be responsible to the DOE, or DOE's representative, on all technical matters pertaining to the project. GeoProducts has designated W. Darrell Gertsch as Project Manager, drilling operations.

Department of Energy, Idaho Operations Office. The DOE Program Office and their subcontracted technical advisors will intereact with the GeoProducts project management to ensure compliance with the terms and schedule of the cooperative agreement and to provide technical advice or assistance where appropriate.

Drilling Engineering and Operations Subcontractor. GeoProducts has selected, through a competitive solicitation process, a subcontract team to provide technical consulting and supervisory assistance for all phases of field operations including well design, drilling supervision and management, geochemical and geologic analysis, well testing, and reservoir engineering. The team selected is GeothermEx, Inc. of Berkeley,

California, and Thermasource, Inc. of Santa Rosa, California. The field program supervisor is Dr. James McNitt of GeothermEx Inc. Under Dr. McNitt's direction, Thermasource will generally be responsible for all drilling engineering/supervision activities and GeothermEx will be responsible for all well testing and analytical activities, and reservoir engineering.

Field Program Supervisor. The field program supervisor or his designee will report directly to the Project Manager and will be on location during all drilling operations, help prepare drilling specifications, examine equipment, and be the direct contact with all drilling subcontractors, including the contract driller. The responsibility of this contractor is to insure that the drilling operations are carried out in an efficient, safe, timely, and cost effective manner and that the geothermal resource is evaluated accurately.

Environmental Consultant. The environmental consultant will participate in the project as appropriate to ensure compliance with environmental regulations and for the mitigation of potentially adverse environmental impacts, including effects of drilling operations on plant and animal life, water quality, and archaeological/historical reserves.

Contract Driller. The contract driller will report directly to the field program supervisor or his drilling superintendent. Once drilling specifications have been determined, the project manager will make a formal request for proposals (RFP) for drilling services. The successful contract driller will be selected on the basis of availability, experience, qualifications

(including equipment), and cost.

Once selected, the contract driller will be responsible for timely, safe and cost effective execution of the drilling program as set forth in the RFP and resulting contract. Contractually, the contract driller will be responsible to GeoProducts, but will be under the operational supervision of the Field Program Subcontractor.

Legal. Legal counsel will be provided to the Project Manager on all contractual and other legal matters.

TASK COST AND SCHEDULE

Shown in Table 1 is the task cost and schedule summary. The schedule denotes the month(s) from the time the project was initiated during which the indicated activity will be conducted. All reasonable measures will be undertaken to ensure schedule integrity and acceleration.

Table 1. Task Schedule and Cost Summary

	Task	Time Frame (months from start)	Estimated Cost
1.	Project Management	0-15	$173,002
2.	Environmental Institutional	0-3	6,770
3.	Exploration and Site Selection	3-4	4,000
4.	Production Drilling and Logging	4-8	698,250
5.	Production Flow Testing	8-9	23,000
6.	Injection Drilling and Testing	9-13	577,474
7.	Determination of Cost Share	13-14	----
8.	Final Technical Report	14-15	5,000
9.	Reporting	-----	6,088
	TOTAL	15 months	$1,493,584

WORK SCHEDULE

Figure 2 provides a real time work schedule showing the phased interrelationship of the several tasks. The work schedule includes milestones, decision points, and periods for DOE review.

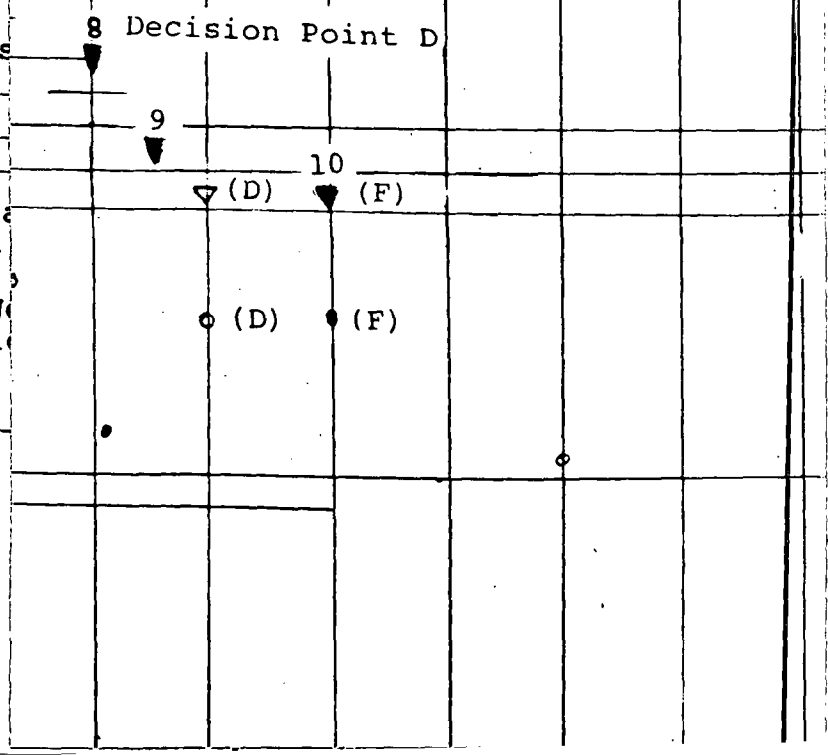
The time duration of those activities scheduled beyond Mileston 4 (particularly production flow testing and injection drilling) depend to a large extent on the success of the production drilling effort. It may become necessary, for example, to extend production flow testing for a number of months, rather than weeks or days. Or it may be decided that sequential drilling operations are desirable. The schedule shown, however, assumes moderate degrees of success in the respective tasks, especially the production drilling effort.

Following Figure 2 is a summary of Milestones and Decision Points.

TASKS

APR MAY JUN JUL

1. PROJECT MANAGEMENT
2. ENVIRONMENTAL AND INSTITUTIONAL
   a. Environmental Report
   b. Management Plan
   c. Exploration Report
   d. File Permits
3. REVIEW EXPLORATION DATA AND CONFIRM DRILL SITE
4. PRODUCTION DRILLING AND LOGGING
   a. Select Drilling Supervisor
   b. Up-date Drilling Program
   c. Prepare Bid Specs.
      1) DOE Review
   d. Issue Drilling Specs
   e. Review Bids and Select Cont
      1) DOE Review
   f. Production Well
      1) Site Preparation
      2) Rig Move-in and Drilli
   g. Review Drilling Data
5. PRODUCTION FLOW TESTING
   a. Well Stabilization; Baseli
   b. Up-date Test Plan
   c. Review by DOE
   d. Reservoir Testing
   e. Review of Reservoir Data aC
      Future Drilling Activities
6. INJECTION DRILLING & TESTING
   a. Obtain Drilling Contractor
      1) DOE review
   b. Drill Well
      1) Site Preparation
      2) Rig Move-in and Drilli
   c. Review Drilling Data
   d. Injection Testing
   e. Review Reservoir Data; Ass
      ture Drilling Activities
7. DETERMINATION OF COST-SHARE
8. FINAL TECHNICAL REPORT
9. REPORTING
   a. Management and Project Sta
   b. Technical Progress Report
   c. Final Technical Report
   d. Drilling Reports, Logs, W
      Cuttings, and Fluid Sampl
   e. Reservoir Test Data
   f. Final Cost Report
10. INFORMATION DISSEMINATION



MILESTONE AND DELIVERABLE SCHEDULE

Milestone	Deliverable	Estimated Completion Date	Actual Completion Date
1. Approved Environmental Evaluation	1. Management Plan 2. Milestone Report 3. Environmental Evaluation 4. Exploration Report	3/30/81	3/30/81
2. Site Selection Agreement		3/30/81	3/30/81
3. Approved Drilling and Completion Plan and Bid Specification	Drilling and Completion Plan Bid Specification	5/15/81	
4. Completion of Drilling	1. Drilling Subcontract 2. Daily Drilling Reports 3. Well Logs 4. Well Cuttings 5. Fluid Sample Analysis 6. Other pertinent data gathered during drilling for determination of flow testing parameters.	9/30/81	
5. Well Test Plan	Well Test Plan	10/10/81	
6. Flow Test Plan	Daily Testing Reports (both verbal and testing data)	11/25/81	
7. Need for Injection Well	Injection Well Plan Daily Drilling Reports (both verbal and written)	12/10/81	
8. Injection Well Testing	Daily Testing Reports (both verbal and written)	3/30/82	
9. Determination of Cost Share	Final Cost Report	3/15/82	
10. Project Completion	Final Technical Report	5/30/82	

MILESTONE AND DECISION POINT INFORMATION

Milestone 1. Copies of all pertinent environmental, drilling, resource, and access rights and/or permits will be provided to DOE. The environmental report, management plan, milestone report, and exploration report will be presented to DOE.

Milestone 2 and Decision Point A. The extensive geophysical, geologic, geochemical, and hydrologic studies completed for GeoProducts will be presented to DOE. The well sites selection study will be presented for DOE review and concurrence. The decision to be made will consist of identifying the optimum location for a production drill site.

Milestone 3. The well drilling and completion plan and bid specifications for the well which will be used to select a contract driller will be presented to and approved by DOE.

Milestone 4 and Decision Point B. At the conclusion of the production well drilling phase, DOE will have received all well data including logs, cuttings, fluid samples, drilling reports, and other pertinent data for determination of flow testing parameters. Tentative decisions will be made concerning the adequacy of the resource for the intended use. Pending the results of the drilling activity, the decision will be made to either conclude or modify the resource development phase by moving to an alternate drill site and/or commence the injection drilling phase.

Milestone 5. The test plan will be prepared and reviewed by DOE.

Milestone 6. Well testing and reservoir engineering will be completed. Daily testing reports, both verbal and written, and testing data will be provided by DOE.

Milestone 7 and Decision Point C. All drilling, test, and reservoir data accumulated to date will be reviewed and the need and location determined for an injection well.

Milestone 8 and Decision Point D. All accumulated data from the injection drilling and test program will be submitted to and reviewed by DOE. The adequacy of the well and formations for fluid disposal purposes will be determined. All field development activities to date will be reviewed and decisions reached concerning the interest of the respective parties in continued reservoir development.

Milestone 9. Resource data accumulated from the drilling and well testing program will be used as the basis for deriving an equitable cost-share arrangement between DOE and the participant. The cost share formula to be used is included in the cooperative agreement.

Milestone 10. A final technical report will be prepared which discusses all phases of the resource development activity and summarizes the technical results.