

L. L. Mink

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| ID FORM-182 (Rev. 10-77) U. S. DEPARTMENT OF ENERGY COOPERATIVE AGREEMENT PURSUANT TO AUTHORITY OF PL 93-410, PL 93-438, PL 93-473, PL 93-577, and PL 95-91 | 1a. Agreement No. DE-FC07-79ID12030 1b. Modification No. | | | | | | | | |
|--|--|--------|-----|--------------|-------------|-------------|----------------------|---------------------|--|
| 3. Participant Name and Address University of North Dakota University Station Grand Forks, ND 58202 | 2. Agreement Period From: Jan. 15, 1979 To: Jan. 31, 1980 GEOTHERMAL ENERGY BRANCH | | | | | | | | |
| 5. Project Title Hydrothermal Resources of North Dakota | 4. Participant Type <input checked="" type="checkbox"/> Educational <input checked="" type="checkbox"/> Nonprofit <input type="checkbox"/> State or Local Government <input type="checkbox"/> Profit | | | | | | | | |
| 8. Principal Investigator(s) or Program Director(s) Name and Address Kenneth L. Harris North Dakota Geological Survey University of North Dakota University Station Grand Forks, ND 58202 | 6. Project Will Be Conducted Per See Article <u>I</u> 7. Technical Reports Are Required See Article <u>V</u> | | | | | | | | |
| 12. Submit Vouchers, if any, to Agreements Officer Unless Otherwise Specified in this Block Director, Contracts Management Division, 550 Second Street Idaho Falls, ID 83401 | 9. DOE Program Officer (Name and Address) Leland L. Mink, E&T Division Idaho Operations Office, DOE 550 Second Street, Idaho Falls, ID 83401 Telephone No. (208)526-0638 | | | | | | | | |
| 13. Funding Sources <table border="1"> <thead> <tr> <th>Source</th> <th>Amount</th> </tr> </thead> <tbody> <tr> <td>DOE</td> <td>\$ 41,597.00</td> </tr> <tr> <td>Participant</td> <td>\$ 9,547.00</td> </tr> <tr> <td>Total Funding</td> <td>\$ 51,144.00</td> </tr> </tbody> </table> | Source | Amount | DOE | \$ 41,597.00 | Participant | \$ 9,547.00 | Total Funding | \$ 51,144.00 | 11. Method of Payment <input type="checkbox"/> % At Award, % When Requested, % Upon Receipt of Final Report <input type="checkbox"/> Letter of Credit <input type="checkbox"/> Reimbursement <input checked="" type="checkbox"/> Other (specify) See Article <u>III</u> |
| Source | Amount | | | | | | | | |
| DOE | \$ 41,597.00 | | | | | | | | |
| Participant | \$ 9,547.00 | | | | | | | | |
| Total Funding | \$ 51,144.00 | | | | | | | | |
| 15. Amount Delegated By This Action \$ 41,597.00 | 14. Remarks: | | | | | | | | |
| 16. DOE Issuing Office (Name and Address) Idaho Operations Office 550 Second Street Idaho Falls, Idaho 83401 | | | | | | | | | |
| 17. DOE Cooperative Agreements Officer (Signature) _____ (Date) _____ Name (typed) <u>R. E. Simonds</u> Title <u>Director, Contracts Mgmt. Division</u> Telephone No. <u>(208) 526-1347</u> | 18. Participant Acceptance By _____ Signature of Authorized Official Name (typed) _____ Title _____ | | | | | | | | |

CONFORMED COPY

COOPERATIVE AGREEMENT

THIS AGREEMENT, entered into the 7th day of March 1979 (effective as of the 15th day of January 1979), by and between the UNITED STATES OF AMERICA (hereinafter called the "Government"), acting through the DEPARTMENT OF ENERGY (hereinafter called "DOE") with its Idaho Operations Office located at 550 Second Street in Idaho Falls, Idaho 83401, and the UNIVERSITY OF NORTH DAKOTA (hereinafter called the "Participant") located at Grand Forks, North Dakota;

WITNESSETH THAT:

WHEREAS, the Government is interested in the evaluation and development of hydrothermal resources in North Dakota; and

WHEREAS, the Participant has proposed to undertake such a program and DOE desires to provide certain financial assistance for the accomplishment of such a program; and

WHEREAS, this Agreement is authorized by the Department of Energy Organization Act (Public Law 95-91), Sections 7(a)(2) and 8 of Public Law 93-577, and Sections 103(5) and 107(a) of Public Law 93-438;

NOW, THEREFORE, DOE and the Participant agree as follows:

ARTICLE I - STATEMENT OF JOINT OBJECTIVE

The direct application of hydrothermal energy at various sites located within North Dakota can be a significant factor in the Government's efforts to achieve energy independence. The research provided for in this Agreement is important to both the Government and the Participant for estimating the potential of hydrothermal energy utilization and for fostering its use in North Dakota.

ARTICLE II - DESCRIPTION OF RESPONSIBILITIES

The Participant is responsible to assure that the research is accomplished in a manner consistent with the provisions of this Agreement. The Participant's proposal identified as an evaluation of hydrothermal resources of North Dakota, as it may have been amended, is made part of this Agreement by this reference; however, if there is any conflict between the content of the proposal and the content of this Agreement, the content of this Agreement governs. The tasks provided for in the proposal are to be accomplished, and are to result in, a final report which will include, as a minimum, the following information:

ARTICLE II - DESCRIPTION OF RESPONSIBILITIES (Cont'd)

Task 1

Summarize existing bottom hole data from approximately 6,500 oil and gas well logs on file with the North Dakota Geological Survey (NDGS) to evaluate the geothermal potential in North Dakota.

Task 2

Produce computer generated maps showing location, depth and expected temperatures of potential hydrothermal reservoirs.

Task 3

Using existing information evaluate the water quality of the Madison aquifer and other potential hydrothermal reservoirs in North Dakota.

Task 4

Publish and make available final reports and maps generated indicating the geothermal potential of North Dakota.

The Participant is also responsible for cost-sharing to the extent provided for in Article III, "Financial Support of the Project."

ARTICLE III - FINANCIAL SUPPORT OF THE PROJECT

A. The total estimated cost of performing the work under this Agreement is Fifty-One Thousand One Hundred Forty-Four Dollars (\$51,144.00). For performance of work under this Agreement, the agreed share ratio is 81.33% DOE, 18.67% Participant of total allowable costs. The Participant shall be reimbursed by DOE for not more than 81.33% of the costs of the project determined to be allowable in accordance with Article A-I of the General Provisions entitled "Allowable Costs." The remaining 18.67% or more of the costs of the project so determined shall constitute the Participant's share for which it will not be reimbursed by DOE. The total cost to DOE is hereby established as Forty-One Thousand Five Hundred Ninety-Seven Dollars (\$41,597.00), and this amount is also the maximum amount of the project which is subject to reimbursement by DOE unless such maximum cost is changed in writing by the Contracting Officer.

B. As regard to any increase or decrease in the total estimated cost of this Agreement as a result of any change in the original Statement of Work as may be agreed upon by the parties during the term of this Agreement, the appropriate sharing of the funding, if any, of such increase or decrease shall be shared at the ratio of 81.33% DOE, 18.67% Participant, as agreed upon above.

| | | | |
|---|------------------------------------|--|--------------------------------|
| 1. AMENDMENT/MODIFICATION NO. A002 | 2. EFFECTIVE DATE 3/9/80 | 3. ACQUISITION/PURCHASE REQUEST NO. | 4. PROJECT NO. (If applicable) |
| 5. ISSUED BY U.S. Department of Energy Idaho Operations Office 550 Second Street Idaho Falls, Idaho 83401 | | 6. ADMINISTERED BY (If other than block 5) | |

| | | | |
|---|------|---------------|--|
| 7. CONTRACTOR NAME AND ADDRESS (Street, city, county, state, and ZIP Code) University of North Dakota University Station P. O. Box 8103 Grand Forks, North Dakota 58202 Attn: Kenneth L. Harris | CODE | FACILITY CODE | 8. AMENDMENT OF SOLICITATION NO. _____ DATED _____ (See block 9) MODIFICATION OF CONTRACT/ORDER NO. DE-FC07-79ID12030 DATED 3/7/79 (See block 11) |
|---|------|---------------|--|

THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in block 12. The hour and date specified for receipt of Offers is extended, is not extended. Offerors must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended, by one of the following methods: (a) By signing and returning _____ copies of this amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If, by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

ACCOUNTING AND APPROPRIATION DATA (If required)

THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS

(a) This Change Order is issued pursuant to _____
 The Changes set forth in block 12 are made to the above numbered contract/order.

(b) The above numbered contract/order is modified to reflect the administrative changes (such as changes in paying office, appropriation data, etc.) set forth in block 12.

(c) This Supplemental Agreement is entered into pursuant to authority of Public Law 95-91 et al.
 It modifies the above numbered contract as set forth in block 12.

DESCRIPTION OF AMENDMENT/MODIFICATION

1. Article II - DESCRIPTION OF RESPONSIBILITIES is revised to incorporate the Participant's proposal entitled "An Evaluation of Hydrothermal Resources of North Dakota - Phase II" dated January 21, 1980 and to add the following tasks:

"Task 5

Thermal gradients will be obtained from holes of opportunity to verify validity of previously acquired data. In addition, heat flow calculations will be determined on holes of opportunity where core samples are available. A state-wide thermal gradient map will be prepared based on these and prior investigations.

Continued...

As provided herein, all terms and conditions of the document referenced in block 8, as heretofore changed, remain unchanged and in full force and effect.

CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN 3 COPIES TO ISSUING OFFICE

| | | | |
|---|-----------------------------------|--|-----------------------------------|
| 9. NAME OF CONTRACTOR/OFFEROR <i>Earl J. Freise</i> (Signature of person authorized to sign) | 10. DATE SIGNED 3-21-80 | 11. UNITED STATES OF AMERICA <i>J. P. Anderson</i> (Signature of Contracting Officer) | 12. DATE SIGNED 3/21/80 |
| 13. NAME AND TITLE OF SIGNER (Type or print) Earl J. Freise, Director Office of Research & Prog. Dev. | | 14. NAME OF CONTRACTING OFFICER (Type or print) J. P. Anderson, Chief Contract Administration Branch | |

Task 6

Detailed geologic maps of potential hydrothermal aquifers will be constructed for areas defined in the referenced proposal. The maps will contain detailed structural information, sand-shale ratios, expected temperatures of permeable sands, probabilities of encountering productive sands, and the proximity of population centers.

Task 7

Water quality data will be collected from county, city and local sources, as well as other state and federal agencies. Efforts will be concentrated in areas of geothermal interest as defined by previous work. These data will be entered into the data base system developed by this project.

Task 8

Any known thermal wells and corresponding geochemical information in the state will be forwarded to the USGS for incorporation in the GEOTHERM file."

2. Article II - FINANCIAL SUPPORT OF THE PROJECT is revised to read as follows:

"A. The total estimated cost of performing the work under this Agreement is One Hundred Seventy-Three Thousand Four Hundred Eighty-Four Dollars (\$173,484.00). For performance of work under this Agreement, the agreed share ratio is 82.87% DOE, 17.13% Participant of total allowable costs. The Participant shall be reimbursed by DOE for not more than 82.87% of the costs of the project determined to be allowable in accordance with Article A-I of the General Provisions entitled 'Allowable Costs.' The remaining 17.13% or more of the costs of the project so determined shall constitute the Participant's share for which it will not be reimbursed by DOE. The total cost to DOE is hereby established as One Hundred Forty-Three Thousand Seven Hundred Sixty-Six Dollars (\$143,766.00) and this amount is also the maximum amount of the project which is subject to reimbursement by DOE unless such maximum cost is changed in writing by the Contracting Officer.

3. With regard to any increase or decrease in the total estimated cost of this Agreement as a result of any change in the original Statement of work as may be agreed upon by the parties during the term of this Agreement, the appropriate sharing of the funding, if any, of such increase or decrease shall be shared at the ratio of 82.87% DOE, 17.13% Participant, as agreed upon above.

C. The amount of funds obligated under this Agreement by DOE is One Hundred Thirty-Nine Thousand One Hundred Eighty-Eight Dollars (\$139,188.00). The balance of \$4,578.00 ~~represents equipment added as Government Property by this Modification No. A002 and will be obligated when and if funds become available. In no event will the Participant be reimbursed for this equipment unless and until the remaining funds are obligated.~~ At the 100% level of the obligated funds, the Participant shall stop all work." *E.S.F. J*

The total shares, estimated cost and obligated funds are summarized as follows:

| | <u>DOE Share</u> | <u>U of ND Share</u> | <u>Est. Cost</u> | <u>DOE Funds Obligated</u> |
|-------------------|------------------|----------------------|------------------|----------------------------|
| Original Contract | \$ 41,597 | \$ 9,547 | \$ 51,144 | \$ 41,597 |
| Inc. per Mod M001 | -0- | -0- | -0- | -0- |
| Inc. per Mod A002 | <u>102,169</u> | <u>20,171</u> | <u>122,340</u> | <u>97,591</u> |
| Total | \$143,766 | \$ 29,718 | \$173,484 | \$139,188 |
| % Share | 82.87% | 17.13% | | |

3. Article IV - TERM OF AGREEMENT is revised to extend the term of the the Agreement from March 8, 1980 to March 7, 1981.
4. Article VII - PROJECT INFORMATION, paragraph A. is revised to refer to the DOE Form CR-537 attached to this Modification No. A002.
5. Article IX - TERMINATION, paragraph D. is changed to incorporate the Government's revised percentage share of 82.87%.
6. Article XIII - GOVERNMENT PROPERTY is revised to add the following items of government property:

| | | |
|---|--------------------------|-----------------|
| One Thermister Temperature Probe | ----- \$ 263 | <i>E.S.F. J</i> |
| One Gamma Ray Logging Tool | ----- \$1,350 | |
| One Constant Temperature Bath | ----- \$ 965 | <i>E.S.F. J</i> |
| One Four-Conductor Bore Hole Cable (2,000 ft.) | ----- \$2,000 | <i>E.S.F. J</i> |