

1. CONTRACT (Proc. Inst. Ident.) NO. <b>EG-77-C-08-1525</b>	2. EFFECTIVE DATE <b>9-23-77</b>	3. REQUISITION/PURCHASE REQUEST/PROJECT NO. <b>G08-77-1045</b>	4. CERTIFIED FOR NATIONAL DEFENSE UNDER BSDA REG. 2 AND/OR DMS REG. 1. RATING: <b>N/A</b>
5. ISSUED BY <b>U.S. Energy Research &amp; Development Admin. Nevada Operations Office P. O. Box 14100 Las Vegas, Nevada 89114</b>		6. ADMINISTERED BY <i>(If other than block 5)</i>	7. DELIVERY FOB DESTINATION <input checked="" type="checkbox"/> OTHER (See below)

8. CONTRACTOR NAME AND ADDRESS <i>(Street, city, county, State, and ZIP code)</i> <b>Thermal Power Company 601 California Street San Francisco, California 94108</b>	<div style="border: 2px solid black; padding: 5px; display: inline-block;"> <p><b>THIS IS ONE COPY OF THE EXECUTED DOCUMENT</b></p> <p><b>EXECUTED</b></p> <p><b>CONTRACTS &amp; PROCUREMENT DIVISION</b></p> </div>
10. SUBMIT INVOICES (4 copies unless otherwise specified) TO ADDRESS SHOWN IN BLOCK <b>12</b> <b>In duplicate</b>	

11. SHIP TO/MARK FOR <b>See attached "Schedule."</b>	12. PAYMENT WILL BE MADE BY <b>U. S. Energy Research &amp; Development Admin. Finance Division P. O. Box 14100 Las Vegas, Nevada 89114</b>
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13. THIS PROCUREMENT WAS  ADVERTISED,  NEGOTIATED, PURSUANT TO:  10 U.S.C. 2304 (a) ( )  41 U.S.C. 252 (c) ( ) **10**

14. ACCOUNTING AND APPROPRIATION DATA  
**EB02-03HTA**

15. ITEM NO.	16. SUPPLIES/SERVICES	17. QUANTITY	18. UNIT	19. UNIT PRICE	20. AMOUNT
	<p>This Contract EG-77-C-08-1525 consists of (1) Schedule, (2) General Provisions, Standard Form 32, with Alterations and Additions thereto, and (3) Appendix B, Intellectual Property Clauses; all as attached hereto and made a part hereof with Article B-6 "Rights in Technical Data" of Appendix B amended as follows: Paragraphs g and h are deleted and the first 3 lines of paragraph e "Withholding of Proprietary Data" are revised to read: "Except as provided in the Article entitled 'Deliverables' the Contractor - - -"</p>				

21. TOTAL AMOUNT OF CONTRACT **\$ 282,000**

**CONTRACTING OFFICER WILL COMPLETE BLOCK 22 OR 26 AS APPLICABLE**

22. <input checked="" type="checkbox"/> CONTRACTOR'S NEGOTIATED AGREEMENT (Contractor is required to sign this document and return <u>2</u> copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (a) this award/contract, (b) the solicitation, if any, and (c) such provisions, representations, certifications, and specifications, as are attached or incorporated by reference herein. (Attachments are listed herein.)	26. <input type="checkbox"/> AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number _____, including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the items listed above and on any continuation sheets. This award consummates the contract which consists of the following documents: (a) the Government's solicitation and your offer, and (b) this award/contract. No further contractual document is necessary.
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23. NAME OF CONTRACTOR <b>Thermal Power Company</b> BY <u><i>W. L. D'Olier</i></u> <small>(Signature of person authorized to sign)</small>	27. UNITED STATES OF AMERICA BY <u><i>Robert W. Taft</i></u> <small>(Signature of Contracting Officer)</small>
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24. NAME AND TITLE OF SIGNER (Type or print) <b>W. L. D'Olier Vice President</b>	25. DATE SIGNED <b>27 April 1977</b>	28. NAME OF CONTRACTING OFFICER (Type or print) <b>Robert W. Taft, Assistant Manager for Plans Engineering &amp; Budgets</b>	29. DATE SIGNED <b>9/19/77</b>
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SCHEDULE

Article 1 Deliverables

- A. Definition: "Data" shall mean recorded information of a scientific or technical nature regardless of form or character. It shall include, but not be limited to, surveys, maps, charts, displays, analyses, evaluations, studies and environmental evaluations.
- B. Data to be Delivered. Within 10 days after the effective date of this Contract, the Contractor shall provide to the ERDA on a non-proprietary basis irrespective of paragraph e "Withholding of Proprietary Data" of Article B-6, "Rights in Technical Data" of Appendix B of this Contract, the following data from its Utah State Wells 14-2 and 72-16:
1. From Well Utah State 14-2, Roosevelt Steam Field SW Utah, T27S, R9W, Section 2
    - a. General Well specifications
    - b. Borehole data
      - (1) Well summary, drilling history and bit record
      - (2) Alpha Beta Gamma Associates, Inc., Lithologic log, 79' - 6100'
      - (3) Drill Cutting Samples

- (4) Agnew & Sweet wireline temperature and pressure logs:

Static temperature survey	October 16, 1976
Static temperature survey	November 15, 1976
Static temperature survey	November 18, 1976
2 Static pressure surveys	November 18, 1976

- (5) Schlumberger logs:

Conventional temperature log	Run 1	110'-1810'
Special high resolution temperature log	Runs 2	1500'-1621'
Induction electric log	Runs 1 & 2	650'-6118'
BHC sonic log with gamma ray	Runs 1 & 2	600'-6112'
Compensated neutron formation density log	Runs 1 & 2	600'-6121'

c. Production and reservoir data (48 hour flow test)

- (1) Description of test and testing procedure
- (2) Flow rates and calculations
- (3) Fluid temperature and pressure data
- (4) Analyses of water samples at six hour intervals
- (5) Steam and water analysis by USGS

2. From Well Utah State 72-16, Rossevelt Steam Field T27S, R9W, Section 16

a. General well specifications

b. Borehole data:

- (1) Well summary, drilling history and bit record
- (2) Alpha Beta Gamma Associates, Inc., lithologic log, 85' - 1245'
- (3) Cut of samples (each 10')
- (4) Agnew & Sweet wireline temperature and pressure logs:

Static temperature survey November 17, 1976

Static temperature survey March 30, 1977

Static pressure survey March 30, 1977

Static temperature survey April 5, 1977

- (5) Schlumberger logs:

Conventional temperature log Run 1 0' - 525'

HRT temperature log Run 2 50' - 1012'

VDL-GR cement bond log Run 1 0' - 534'

Special Run 2 20' - 999'

c. Production and reservoir data (24 hour flow test)

- (1) Description of test and testing procedure
- (2) Flow rates and calculations
- (3) Fluid temperature and pressure data
- (4) Analysis of water samples
- (5) Pressure build-up data

The "cut of samples" data from both wells shall be forwarded to:

Dr. Howard Ross, Earth Sciences Lab.  
University of Utah Research Park  
391 Chipeta Way  
Salt Lake City, Utah 84108

Six (6) copies of all other data above shall be forwarded to:

James B. Cotter, Chief  
Energy Research Projects Branch  
U. S. Energy Research Development & Admin.  
Nevada Operations Office  
P. O. Box 14100  
Las Vegas, Nevada 89114

Article 2 Compensation

The Contractor shall be paid the amount of \$282,000 upon receipt and acceptance of all the deliverables set forth in Article 1, above. The Government reserves the right before acceptance to obtain necessary written clarifications and explanations from the Contractor to establish an understanding of the data received. Up to 5% of the above lump sum amount may be retained pending receipt of such clarifications and explanations and acceptance of all the data required by this Contract.



**THERMAL POWER  
COMPANY**

September 30, 1977

CLARKE	<input checked="" type="checkbox"/>
FIORE	<input type="checkbox"/>
STEARNS	<input type="checkbox"/>
<i>JPC</i>	
ACTION	_____
INFO	_____
R.F.	_____

Mr. James B. Cotter, Chief  
Energy Research Projects Branch  
U. S. Energy Research and  
Development Administration  
Nevada Operations Office  
P. O. Box 14100  
Las Vegas, Nevada 89114

AMA \_\_\_\_\_  
AM/SEE \_\_\_\_\_  
AM P & B \_\_\_\_\_  
AM GPN \_\_\_\_\_

Dear Mr. Cotter:

With reference to Mr. D'Olier's (TPC) letter to Mr. Taft (ERDA) dated September 27, 1977, concerning Contract EG-77-C-08-1525. Six (6) copies of the contracted material is being sent via Certified Mail under separate cover.

-Data from Well Utah State 14-2-

- 1) Well Summary, Drilling History, and Bit Record.
- 2) Lithologic Log by ABG Associates Inc.  
79'-6100'
- 3) Agnew and Sweet Wireline  
Temperature and Pressure Logs:
  - Static Temperature Survey (1) 16 October 1976
  - Static Temperature Survey (1) 15 November 1976
  - Static Temperature Survey (1) 18 November 1976
  - Static Pressure Surveys (2) 18 November 1976
- 4) Schlumberger Logs:
  - Conventional Temperature Log-Run 1 110'-1810'
  - High Resolution Temp. Log-Run 2 1500'-6121'  
with Differential Temp. Curve
  - Induction Electric Log-Runs 1&2 650'-6118'
  - BHC Sonic Log w/ Gamma Ray Runs 1&2 600'-6112'
  - Comp. Neutron-Formation Runs 1&2 600'-6121'
  - Density Log

- 5) Production and Reservoir data from a 48-hour flow test,  
16 to 18 November 1976.

Report includes:

Summary  
Description of Test  
Special Comments on Rock-Throttling and Surging  
Data Reduction Methods  
Sample Calculation  
Calculation Tables  
Value Tables  
Appendix  
Original Data Sheets  
Graphs of Data and Values vs. Time  
P-T Survey Field Readings  
HP-25 Program For  $h_0$  Solution  
Water Analysis

-Data from Well Utah State 72-16-

- 1) Well Summary, Drilling History, and Bit Record.
- 2) Lithologic Log by ABG Associates Inc.  
85'-1245'
- 3) Agnew and Sweet Wireline  
Temperature and Pressure Logs:
- |                           |                  |
|---------------------------|------------------|
| Static Temperature Survey | 17 November 1976 |
| Static Temperature Survey | 30 March 1977    |
| Static Pressure Survey    | 5 April 1977     |
| Static Pressure Survey    | 30 March 1977    |
- 4) Schlumberger Logs:
- |   |           |
|---|-----------|
| Temperature Log-Run 1                             | 0'-525'   |
| Temperature Log HRT-Run 2<br>w/ Diff. Temp. Curve | 50'-1012' |
| Cement Bond Log VDL-GR-Run 1                      | 0'-534'   |
| Cement Bond Log VDL-Run 2                         | 20'-999'  |

Mr. James B. Cotter  
September 30, 1977  
Page Two

- 5) Production and Reservoir data from a 48-hour flow test, 16 to 18 November 1976.

Report includes:

Summary  
Description of Test  
Special Comments on Rock-Throttling and Surging  
Data Reduction Methods  
Sample Calculation  
Calculation Tables  
Value Tables  
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HP-25 Program For  $h_0$  Solution  
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-Data from Well Utah State 72-16-

- 1) Well Summary, Drilling History, and Bit Record.
- 2) Lithologic Log by ABG Associates Inc.  
85'-1245'
- 3) Agnew and Sweet Wireline  
Temperature and Pressure Logs:  
Static Temperature Survey 17 November 1976  
Static Temperature Survey 30 March 1977  
Static Pressure Survey 5 April 1977  
Static Pressure Survey 30 March 1977
- 4) Schlumberger Logs:  
Temperature Log-Run 1 0'-525'  
Temperature Log HRT-Run 2 50'-1012'  
w/ Diff. Temp. Curve  
Cement Bond Log VDL-GR-Run 1 0'-534'  
Cement Bond Log VDL-Run 2 20'-999'



3 a/E



**THERMAL POWER**  
COMPANY

May 18, 1977

U. S. Energy Research & Development Administration  
Nevada Operations Office  
P. O. Box 14100  
Las Vegas, Nevada 89114

Attention: Mr. James B. Cotter,  
Chairman  
Source Evaluation Panel

Gentlemen:

Attached for your consideration is a proposal to sell existing data from a producing well in the Roosevelt Steam Field. Well Utah State 72-16.

Very truly yours,

W. L. D'Olier  
Vice President  
Geothermal Operations

KRD/tti

Attachments: Well Data Proposal (10 copies)

- Enclosures:
- 1) Representations and Certifications Standard Form 19-B - Section 1 through 7 (2 pages)
  - 2) Supplement to Representations and Certifications - Section 8 through 13 (6 pages)
  - 3) Contract Pricing Proposal (2 pages)  
Well Cost-Summary of Expenditures

A. Proposal To The  
United States Energy Research and  
Development Administration  
For The Geothermal Reservoir  
Assessment Case Study Program  
(RFP No. EY-R-08-0007)

A. From: Thermal Power Company (TPC)  
601 California Street  
San Francisco, California 94108

B. Technical Proposal

1. Borehole and reservoir data from a producible well is submitted as a candidate for a cash award.

a) Producible well Utah State 72-16 in Roosevelt Steam Field of southwest Utah - T27S, R9W, Section 16, S.L.B.&M. From NE corner 990'S, 990'E.

b) Owners:

- 1) O'Brien Resources (2/3rds)
- 2) TPC (1/6th) Operator of well
- 3) Thermal Exploration Company (1/6th)

2. Data offered and description:

a) General:

-Well Utah State 72-16

- 1) Well commenced: 22 October 1976
- 2) Well completed: 31 December 1976
- 3) Total depth: 1254'
- 4) Hole configuration: 9-5/8" casing to 1098'  
12 1/4" open hole 1098'-1245'  
8 1/2" open hole 1245'-1254'
- 5) Maximum Temperature: 469°F. at T.D.
- 6) Producing Interval: 1245'-1254'
- 7) Producing Rate: Approximate total mass flow  
1.3 million lbs./hr.

## b) Borehole Data Available:

- 1) Well Summary, Drilling History and Bit Record
- 2) Lithologic log 85'-1245' by ABG Associates Inc. - well logging service
- 3) Cut of samples (each 10')
- 4) Agnew & Sweet wireline temperature and pressure logs

A&S static temperature survey - 17 November 1976

A&S static temperature survey - 30 March 1977

A&S static pressure survey - 30 March 1977

A&S static temperature survey - 5 April 1977

## 5) Schlumberger Logs

Temperature Log (conv.)      Run 1      0' - 525'

Temperature Log (HRT)\*      Run 2      50' - 1012'

Cement Bond Log (VDL-GR)      Run 1      0 - 534'

\* Special      Run 2      20' - 999'

- c) Production and reservoir data taken during 24-hour flow test.

## 3. Costs and Release of Data:

- a) Total well cost: \$1,247,555.00
- b) Proposed Cost to Government: 24% or \$299,413.00
- c) Release of data can be made immediately.

### C. Qualification

The following is a summary of our operating qualifications. This should be adequate to evaluate our professional abilities as relates to the quality of the data being offered:

TPC is a California corporation headquartered at 601 California Street, San Francisco, California, 94108. As a 98% owned subsidiary of Natomas Company, TPC is a geothermal operating company which owns a 25% working interest in the wellfields and geothermal energy reserves in The Geysers, Sonoma County, California where geothermal steam is produced to generate electricity from a present aggregate of 522 megawatts of plant capacity built, owned and operated by Pacific Gas & Electric Company. TPC's geologists and engineers represent the corporate interest in all details of the operations at The Geysers, which are conducted by Union Oil Company of California as operator for the Union-Magma-Thermal joint venture on that property. TPC, for its own account and other joint venture accounts has drilled and completed exploratory geothermal wells on other prospects in the western United States. The most recent wells are two wells completed in the Roosevelt Steam Field. These are the latest wells in an ongoing program to evaluate prospective geothermal areas by drilling.



# THERMAL POWER

COMPANY

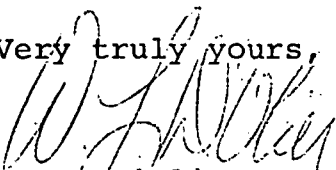
May 18, 1977

U. S. Energy Research & Development Administration  
Nevada Operations Office  
P. O. Box 14100  
Las Vegas, Nevada 89114

Attention: Mr. James B. Cotter,  
Chairman  
Source Evaluation Panel

Gentlemen:

Attached for your consideration is a proposal to sell existing data from a producing well in the Roosevelt Steam Field. Well Utah State 14-2.

Very truly yours,  
  
W. L. D'Olier  
Vice President  
Geothermal Operations

KRD/tti

Attachments: Well Data Proposal (10 copies).

- Enclosures:
- 1) Representations and Certifications Standard Form 19-B - Section 1 through 7 (2 pages)
  - 2) Supplement to Representations and Certifications - Sections 8 through 13 (6 pages)
  - 3) Contract Pricing Proposal (2 pages)  
Well Cost-Summary of Expenditures

A Proposal To The  
United States Energy Research and  
Development Administration  
For The Geothermal Reservoir  
Assessment Case Study Program  
(REP No. EY-R-08-0007)

A. From: Thermal Power Company (TPC)  
601 California Street  
San Francisco, California 94108

B. Technical Proposal

1. Borehole and reservoir data from a producing well is submitted as a candidate for a cash award.

a) Well Utah State 14-2  
Roosevelt Steam Field - SW Utah  
T27S, R9W, Section 2 - Fr. NW cor. 2310'S and 350'E.

b) Owners:

- 1) 50% Thermal Power Company (Operator)
- 2) 50% Thermal Exploration Company

2. Data offered and description:

a) General

-Well Utah State 14-2:

- 1) Spud: 11 September 1976
- 2) Completion: 14 October 1976
- 3) Total depth: 6100'
- 4) Hole configuration: 9-5/8" casing to 1805'  
8 1/2" open hole from 1805'  
to 6100'
- 5) Maximum temperature: 517°F at T.D.
- 6) Producing Intervals: Major: 2924'- 3090'  
Minor: 1812'- 1824'
- 7) Producing Rate: Total mass flow  
495,000 lbs./hr.

## b) Borehole Data Available:

- 1) Well Summary, Drilling History, and Bit Record
- 2) Lithologic Log 79' - 6100' by Alpha Beta Gamma Associates, Inc. - well logging service
- 3) Cut of samples
- 4) Agnew & Sweet wireline temperature and pressure logs
  - A&S static temperature survey 16 October 1976
  - A&S static temperature survey 15 November 1976
  - A&S static temperature survey 2:40 AM, 18 November 1976
  - A&S static pressure survey 2:40 AM, 18 November 1976
  - A&S static pressure survey 6:10 PM, 18 November 1976
- 5) Schlumberger Logs
  - Conventional Temperature Log Run 1 110' - 1810'
  - Special High Resolution Temperature Log Run 2 1500' - 6121'
  - Induction Electric Log Runs 1 & 2 - 650 - 6118'
  - BHC Sonic Log with Gamma Ray Runs 1 & 2 - 600' - 6112'
  - Compensated Neutron-Formation Density Log Runs 1 & 2 - 600' - 6121'

## c) Production and Reservoir data taken during 48-hour flow test.

## 3. Costs and Conditions

- 1) Total well costs: \$544,471.00
- 2) Proposed Cost to Government: 20% or \$108,894.00
- 3) All data may be made available to the public immediately.

### C. Qualification

The following is a summary of our operating qualifications. This should be adequate to evaluate our professional abilities as relates to the quality of the data being offered:

TPC is a California corporation headquartered at 601 California Street, San Francisco, California, 94108. As a 98% owned subsidiary of Natomas Company, TPC is a geothermal operating company which owns a 25% working interest in the wellfields and geothermal energy reserves in The Geysers, Sonoma County, California where geothermal steam is produced to generate electricity from a present aggregate of 522 megawatts of plant capacity built, owned and operated by Pacific Gas & Electric Company. TPC's geologists and engineers represent the corporate interest in all details of the operations at The Geysers, which are conducted by Union Oil Company of California as operator for the Union-Magma-Thermal joint venture on that property. TPC, for its own account and other joint venture accounts has drilled and completed exploratory geothermal wells on other prospects in the western United States. The most recent wells are two wells completed in the Roosevelt Steam Field. These are the latest wells in an ongoing program to evaluate prospective geothermal areas by drilling.