

GTLT - _____ 5 _____

**5-16S-7W
Sierra County**

1124-2 & 1124-3

RECEIVED
MAY 17 1981
OIL CONSERVATION COMMISSION
SANTA FE

GEOHERMAL BRANCH

May 8, 1981

CERTIFIED MAIL #1141329
RETURN RECEIPT REQUESTED

Mr. Carl Ulvog
Senior Petroleum Geologist
State of New Mexico
Oil Conservation Commission
P.O. Box 2088
Santa Fe, New Mexico 87501

RE: AMAX Exploration, Inc. Animas Project (672), Hidalgo County,
New Mexico

"Sundry Notices and Reports on Geothermal Resources Wells" for
Hole Nos. 672-206 and 672-231 under permit approved February 15,
1980 (AMAX No. NM-OC-2028)

Dear Mr. Ulvog:

This letter is written to notify you that drilling activities conducted
by AMAX Exploration, Inc. under the above-referenced permit at the Animas
Project in New Mexico have been completed. The holes were plugged on
April 13, 1981 and proper abandonment and reclamation activities have
been carried out.

The following is submitted in triplicate:

- 1) Geothermal Well Completion Report for each hole which was drilled.
- 2) Lithologic logs, including hole number, location, elevation, date drilled, method used, and gamma for each hole which was drilled.
- 3) Temperature logs for each hole which was drilled.
- 4) Exhibit A indicating Method of Completion and Abandonment Procedure.

The following holes were not drilled:

672-203	672-216	672-230
672-204	672-217	672-232
672-205 ✓	672-218	672-233
672-207	672-222	672-234
672-209	672-229	672-235
672-210		

As AMAX Exploration, Inc. anticipates no further work at these well sites, we request that the case file be closed.

If I can be of further assistance, please contact me at your earliest convenience.

Sincerely,

AMAX EXPLORATION, INC.

Carolyn J. Holtgrewe
Carolyn J. Holtgrewe
Permit Assistant

CJH/bsw

NOV 23 1981

NEW MEXICO OIL CONSERVATION COMMISSION
P. O. Box 2088, Santa Fe 87501

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U.S.G.S.	/	
Operator	/	
Land Office		

APPLICATION FOR PERMIT TO DRILL, DEEPEN,
OR PLUG BACK---GEOTHERMAL RESOURCES WELL

5. Indicate Type of Lease
STATE FEE

5.a State Lease No.
N/A

1a. Type of Work Drill Deepen Plug Back
b. Type of Well Geothermal Producer Temp Observation
Low-Temp Thermal Injection/Disposal

7. Unit Agreement Name
N/A

8. Farm or Lease Name
N/A

2. Name of Operator
AMAX Exploration, Inc.

9. Well No.
1124-2

3. Address of Operator
1707 Cole Boulevard; Golden, Colorado 80401

10. Field and Pool, or Wildcat
Wildcat

4. Location of Well UNIT LETTER H LOCATED 210 FEET FROM THE North LINE
AND 30 FEET FROM THE East LINE OF SEC. 5 TWP. 16S RGE. 7W NMPM

12. County
Sierra

19. Proposed Depth
500'
19a. Formation
Tertiary seds & volcanics
20. Rotary or C.T.
Rotary

21. Elevations (Show whether DF, RT, etc.)
5,480' GR
21A. Kind & Status Plug. Bond
\$10,000 Multiple-
21B. Drilling Contractor
not known at this time

22. Approx. Date Work will start
December 1981

Well Low Temperature Well or Geothermal Observation Well Bond
PROPOSED CASING AND CEMENT PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	SACKS OF CEMENT	EST. TOP
4-3/4" - 6-3/4"	N/A	N/A	N/A	N/A	N/A

- 5-25-83 Inspection OK
- Drill hole 4-3/4" - 6-3/4" to TD
 - Run 3/4" PVC or 3/4" iron pipe to TD
 - Cement top 10' of annulus around pipe
 - Fill pipe with water
 - Measure temperature of hole
 - Install cement plug inside the PVC or iron pipe

At abandonment, top of pipe and cement plug - inside and outside of pipe - to be at least one foot below original ground level, and surface to be restored.

OIL CONSERVATION COMMISSION TO BE NOTIFIED
WITHIN 24 HOURS OF BEGINNING OPERATIONS

APPROVAL VALID FOR 90 DAYS
PERMIT EXPIRES 2-22-82
UNLESS DRILLING UNDERWAY

ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone, or blowout preventer program, if any.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

Signed Carolyn J. Holtgrewe Title Permit Assistant Date November 19, 1981

(This space for State Use)

APPROVED BY Carl Wilcox TITLE SENIOR PETROLEUM GEOLOGIST DATE 11/24/81

CONDITIONS OF APPROVAL, IF ANY:

NOV 23 1981

NEW MEXICO OIL CONSERVATION COMMISSION
P. O. Box 2088, Santa Fe 87501

NO. OF COPIES RECEIVED		
DISTRIBUTION		
File	1	✓
N.M.	1	
U.S.G.S.	1	
Operator	1	
Land Office		

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b. Type of Well Geothermal Producer Temp Observation
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1124-2

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Wildcat

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AND 30 FEET FROM THE East LINE OF SEC. 5 TWP. 16S RGE. 7W NMPM

12. County
Sierra

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21. Elevations (Show whether DF, RT, etc.) 5,480' GR 21A. Kind & Status Plug. Bond \$10,000 Multiple- 21B. Drilling Contractor not known at this time 22. Approx. Date Work will start December 1981

Well Low Temperature Well or Geothermal Observation Well Bond
PROPOSED CASING AND CEMENT PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	SACKS OF CEMENT	EST. TOP
4-3/4" - 6-3/4"	N/A	N/A	N/A	N/A	N/A

- (1) Drill hole 4-3/4" - 6-3/4" to TD
- (2) Run 3/4" PVC or 3/4" iron pipe to TD
- (3) Cement top 10' of annulus around pipe
- (4) Fill pipe with water
- (5) Measure temperature of hole
- (6) Install cement plug inside the PVC or iron pipe

At abandonment, top of pipe and cement plug - inside and outside of pipe - to be at least one foot below original ground level, and surface to be restored.

OIL CONSERVATION COMMISSION TO BE NOTIFIED
WITHIN 24 HOURS OF BEGINNING OPERATIONS

APPROVAL VALID FOR 90 DAYS
PERMIT EXPIRES 2-22-82
UNLESS DRILLING UNDERWAY

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. Give blowout preventer program, if any.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

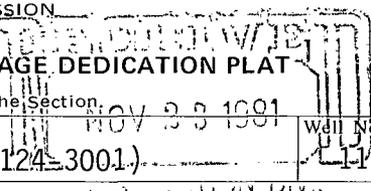
Signed Carolyn J. Holtgrewe Title Permit Assistant Date November 19, 1981
(This space for State Use)

APPROVED BY Carl Ulvog TITLE SENIOR PETROLEUM GEOLOGIST DATE 11/24/81

CONDITIONS OF APPROVAL, IF ANY:

GEOHERMAL RESOURCES WELL LOCATION AND ACREAGE DEDICATION PLAT

All distances must be from the outer boundaries of the Section.



Operator AMAX Exploration, Inc.			Lease Private (1124-3001)		Well No. 1124-2
Unit Letter H	Section 5	Township 16S	Range 7W	County Santa Fe	

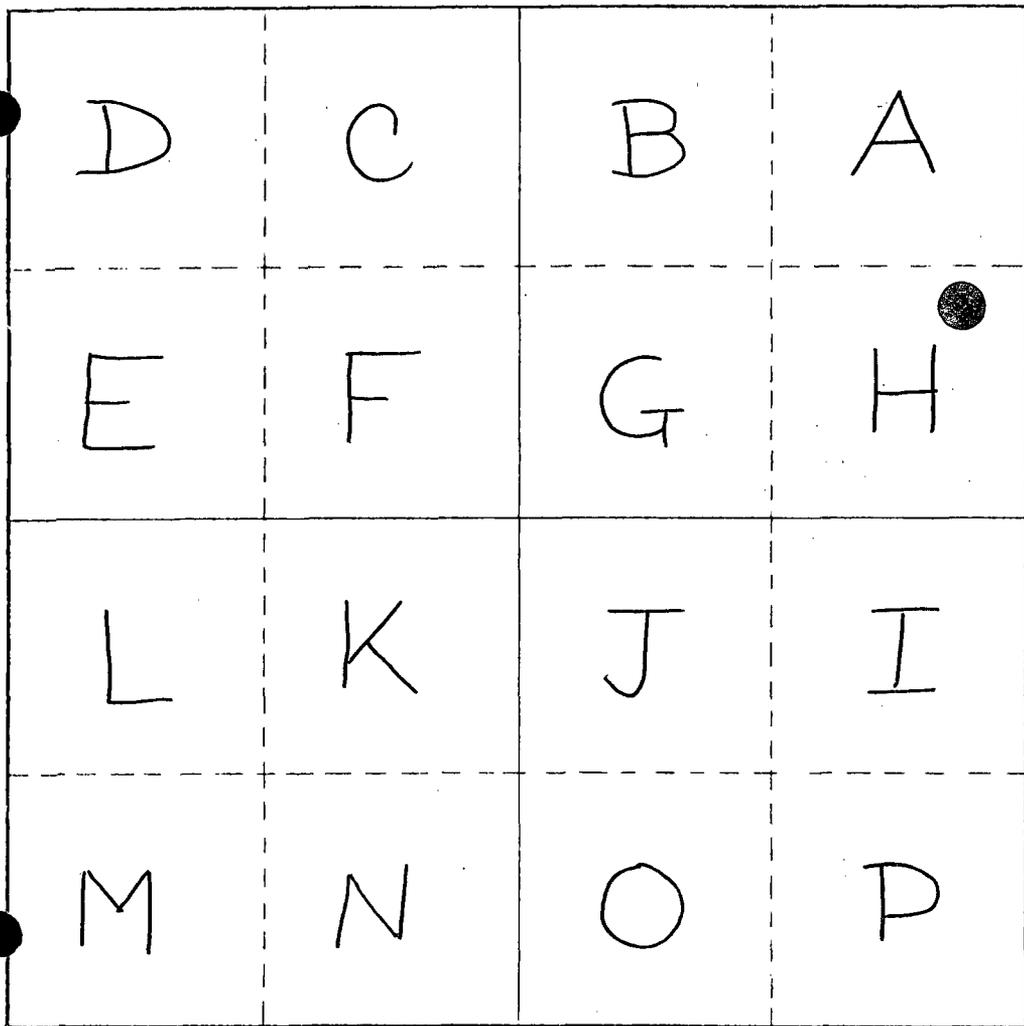
Actual Footage Location of Well:
210 feet from the **North** line and **30** feet from the **East** line

Ground Level Elev. 5,480' GR	Producing Formation N/A	Pool N/A	Dedicated Acreage: N/A Acres
--	-----------------------------------	--------------------	--

- Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below. **N/A**
- If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty). **N/A**
- If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling, etc? **N/A**
 Yes No If answer is "yes," type of consolidation _____

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) _____

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Name	Carolyn J. Holtgrewe <i>Carolyn J. Holtgrewe</i>
Position	Attorney-in-fact Permit Assistant
Company	AMAX Exploration, Inc.
Date	November 19, 1981

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed	
Registered Professional Engineer and/or Land Surveyor	
Certificate No.	

PROJECT DESCRIPTION

AMAX Exploration, Inc. will take necessary measures to protect all aspects of the environment. AMAX Exploration, Inc. also agrees that the proposed drilling program will be conducted in accordance with terms and conditions included within the approved permit.

AMAX Exploration, Inc. is currently permitting four (4) drill site locations for the Hillsboro Project in Sierra County, New Mexico. All of these holes are located on privately held land to which the owner has 100% surface and minerals rights. AMAX Exploration, Inc. will notify the New Mexico Oil Conservation Commission prior to commencing operations.

Exhibit A - Hillsboro Project Information indicates:

- (1) Hole numbers
- (2) Location
- (3) Section
- (4) Township
- (5) Range
- (6) Elevation
- (7) AMAX lease number
- (8) Land status

Shallow exploratory thermal gradient drill holes are usually drilled to depths of 30 to 500 feet. The holes which AMAX Exploration, Inc. proposes to drill will have a maximum depth of 500 feet.

Thermal gradient holes generally are drilled with bits 4-3/4" to 6-3/4" in diameter. Water wells, by contrast, frequently are drilled with bits 8" to 12" in diameter. Consequently, the drilling of a thermal gradient hole usually has less overall impact than the drilling of a water well of comparable depth.

The equipment used to drill shallow thermal gradient drill holes consist of a light truck-mounted rotary drill rig and a water truck. The truck-mounted drill is usually set up on level ground as close as possible to existing roads. No bulldozing or leveling is required nor is the drill dug in. The water truck is parked adjacent to the drill.

Air is used to remove drill cuttings from the holes when drilling above the water table. Water mixed with drilling mud and circulated through a portable mud tank accomplishes the same in drilling below the water table or in areas where the water table is relatively shallow. Foam will be used when necessary and contained within mud tanks or mud sumps. Defoamer will be used only when necessary and also will be contained within mud tanks or mud sumps. No toxic substances will be used at any time. Drill cuttings from the holes are used to back-fill the drill holes.

A 300 foot hole generally requires approximately 5 to 20 hours to drill depending upon rock hardness and other drilling conditions. Under normal conditions, a 500 foot hole requires between 10 and 40 hours to drill. Therefore, depending upon shift length, a 500 foot well can usually be completed in a maximum of five days.

After the drill hole is completed and the drill rods removed from the hole, a PVC or iron pipe of approximately 1" in outside diameter is inserted into the hole. The pipe is capped on the bottom and is filled with water. The drill hole is then backfilled with drill cuttings. Approximately one week later, after the hole has had a chance to reach near thermal equilibrium with the surrounding rocks, a thermister probe is lowered into the hole and temperature measurements are made at intervals down the hole. A second and final temperature survey is made about a month after completion of the well.

Drilling operations are planned to take approximately 30 days. Temperature observation measurements will require an additional 60 days. Thus, the total project operations will require approximately 90 days. Each hole will be used for temperature observation purposes for approximately 8 weeks. Upon completion of operations, the pipe will be cut off at ground level and the top 10' filled with cement.

Mr. Dean Pilkington, Chief Geologist, Geothermal Branch, AMAX Exploration, Inc. will be in charge of the overall operation. Ms. Carolyn J. Holtgrewe, Permit Assistant, AMAX Exploration, Inc. will be responsible for regulatory and environmental matters. All personnel can be contacted at the letter-head address.

Prior to commencement of drilling operations, AMAX Exploration, Inc. will notify the Oil Conservation Commission concerning:

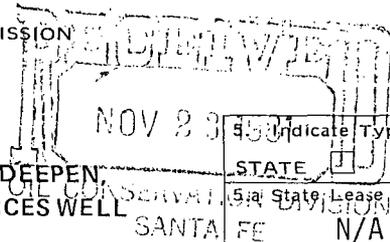
- (1) Actual rig size and capacity
- (2) Name of drilling contractor
- (3) Name of responsible on-site field geologist
- (4) Spud-in date

EXHIBIT A
 Hillsboro Project (1124)
 Sierra County, New Mexico NMPM

<u>Hole Number</u>	<u>Description</u>	<u>Location</u>			<u>Elevation</u>	<u>AMAX Lease No.</u>	<u>Land Status</u>
		<u>Section</u>	<u>Township</u>	<u>Range</u>			
1124-1	NE/4NE/4	5	16S	7W	5,560'	1124-3001	V.H. Cunningham
1124-2	SE/4NE/4	5	16S	7W	5,480'	1124-3001	V.H. Cunningham
1124-3	SE/4NE/4	5	16S	7W	5,480'	1124-3001	V.H. Cunningham
1124-4	SW/4SW/4	4	16S	7W	5,385'	1124-3001	V.H. Cunningham

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U.S.G.S.	/	
Operator	/	
Land Office		

NEW MEXICO OIL CONSERVATION COMMISSION
P. O. Box 2088, Santa Fe 87501



APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK--GEOTHERMAL RESOURCES WELL

Indicate Type of Lease
STATE FEE
5.a) State Lease No. N/A

1a. Type of Work Drill <input checked="" type="checkbox"/> Deepen <input type="checkbox"/> Plug Back <input type="checkbox"/>	7. Unit Agreement Name N/A
b. Type of Well Geothermal Producer <input type="checkbox"/> Temp Observation <input checked="" type="checkbox"/> Low-Temp Thermal <input type="checkbox"/> Injection/Disposal <input type="checkbox"/>	8. Farm or Lease Name N/A
2. Name of Operator AMAX Exploration, Inc.	9. Well No. 1124-3
3. Address of Operator 1707 Cole Boulevard; Golden, Colorado 80401	10. Field and Pool, or Wildcat Wildcat
4. Location of Well UNIT LETTER <u>H</u> LOCATED <u>260</u> FEET FROM THE <u>North</u> LINE AND <u>10</u> FEET FROM THE <u>East</u> LINE OF SEC. <u>5</u> TWP. <u>16S</u> RGE. <u>7W</u> NMPM	12. County Sierra
19. Proposed Depth 500'	19A. Formation Tertiary seds & volcanics
20. Rotary or C.T. Rotary	21. Elevations (Show whether DF, RT, etc.) 5,480' GR
21A. Kind & Status Plug. Bond \$10,000 Multiple-	21B. Drilling Contractor not known at this time
22. Approx. Date Work will start December 1981	

Well Low Temperature Well or Geothermal Observation Well Bond
PROPOSED CASING AND CEMENT PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	SACKS OF CEMENT	EST. TOP
4-3/4" - 6-3/4"	N/A	N/A	N/A	N/A	N/A

5-25-83 Inspection
OK

- (1) Drill hole 4-3/4" - 6-3/4" to TD
- (2) Run 3/4" PVC or 3/4" iron pipe to TD
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- (4) Fill pipe with water
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APPROVAL VALID FOR 90 DAYS
PERMIT EXPIRES 2-22-82
UNLESS DRILLING UNDERWAY

OIL CONSERVATION COMMISSION TO BE NOTIFIED
WITHIN 24 HOURS OF BEGINNING OPERATIONS

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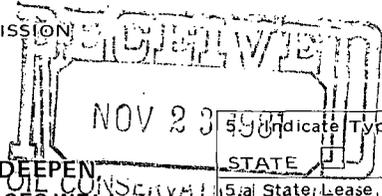
Signed Carolyn J. Holtgrewe Title Permit Assistant Date November 19, 1981

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APPROVED BY Carl W. Hoog TITLE SENIOR PETROLEUM GEOLOGIST DATE 11/24/81

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U.S.G.S.	/	
Operator	/	
Land Office		

NEW MEXICO OIL CONSERVATION COMMISSION
P. O. Box 2088, Santa Fe 87501



APPLICATION FOR PERMIT TO DRILL, DEEPEN OR PLUG BACK--GEOTHERMAL RESOURCES WELL

Indicate Type of Lease
STATE NEW MEXICO FEE XX
State Lease No. N/A
DIVISION SANTA FE

1a. Type of Work Drill <input checked="" type="checkbox"/> Deepen <input type="checkbox"/> Plug Back <input type="checkbox"/>	7. Unit Agreement Name N/A
b. Type of Well Geothermal Producer <input type="checkbox"/> Temp Observation <input checked="" type="checkbox"/> Low-Temp Thermal <input type="checkbox"/> Injection/Disposal <input type="checkbox"/>	8. Farm or Lease Name N/A
2. Name of Operator AMAX Exploration, Inc.	9. Well No. 1124-3
3. Address of Operator 1707 Cole Boulevard; Golden, Colorado 80401	10. Field and Pool, or Wildcat Wildcat
4. Location of Well UNIT LETTER <u>H</u> LOCATED <u>260</u> FEET FROM THE <u>North</u> LINE AND <u>10</u> FEET FROM THE <u>East</u> LINE OF SEC. <u>5</u> TWP. <u>16S</u> RGE. <u>7W</u> NMPM	12. County Sierra
19. Proposed Depth 500'	19A. Formation Tertiary seds & volcanics
20. Rotary or C.T. Rotary	
21. Elevations (Show whether DF, RT, etc.) 5,480' GR	21A. Kind & Status Plug. Bond \$10,000 Multiple-
21B. Drilling Contractor not known at this time	22. Approx. Date Work will start December 1981

Well Low Temperature Well or Geothermal Observation Well Bond
PROPOSED CASING AND CEMENT PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	SACKS OF CEMENT	EST. TOP
4-3/4" - 6-3/4"	N/A	N/A	N/A	N/A	N/A

- (1) Drill hole 4-3/4" - 6-3/4" to TD
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Carolyn J. Holtgrewe, Attorney-in-fact

Signed Carolyn J Holtgrewe Title Permit Assistant Date November 19, 1981

(This space for State Use)

APPROVED BY Carl W. Hoog TITLE SENIOR PETROLEUM GEOLOGIST DATE 11/24/81

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All distances must be from the outer boundaries of the Section.

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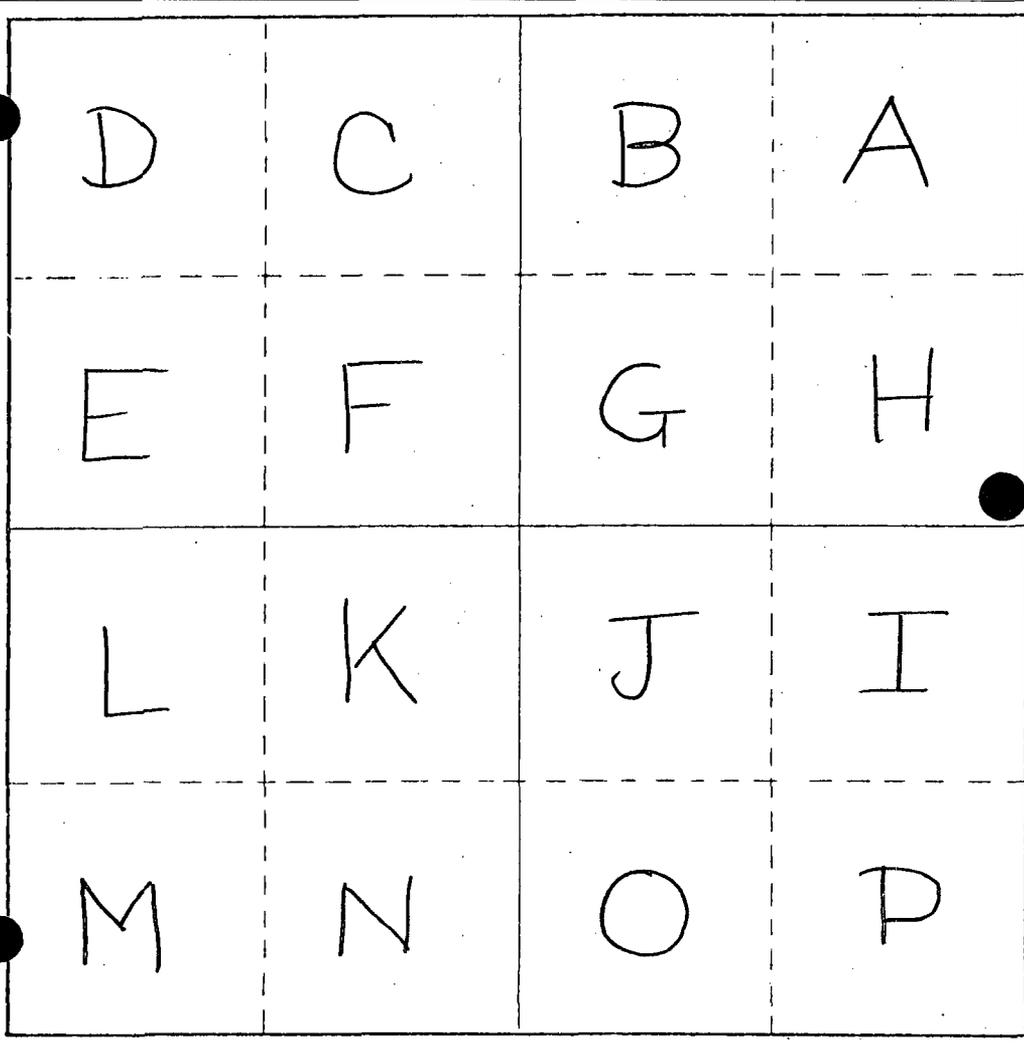
Actual Footage Location of Well:
260 feet from the **North** line and **10** feet from the **East** line

Ground Level Elev. 5,480' GR	Producing Formation N/A	Pool N/A	Dedicated Acreage: N/A Acres
--	-----------------------------------	--------------------	--

- Outline the acreage dedicated to the subject well by colored pencil or hachure-marks on the plat below. **N/A**
- If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty). **N/A**
- If more than one lease of different ownersip is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling, etc? **N/A**
 Yes No If answer is "yes," type of consolidation _____

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) _____

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Name Carolyn J. Holtgrewe <i>Carolyn J. Holtgrewe</i>
Position Attorney-in-fact Permit Assistant
Company AMAX Exploration, Inc.
Date November 19, 1981

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed
Registered Professional Engineer and/or Land Surveyor
Certificate No.

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Exhibit A - Hillsboro Project Information indicates:

- (1) Hole numbers
- (2) Location
- (3) Section
- (4) Township
- (5) Range
- (6) Elevation
- (7) AMAX lease number
- (8) Land status

Shallow exploratory thermal gradient drill holes are usually drilled to depths of 30 to 500 feet. The holes which AMAX Exploration, Inc. proposes to drill will have a maximum depth of 500 feet.

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Prior to commencement of drilling operations, AMAX Exploration, Inc. will notify the Oil Conservation Commission concerning:

- (1) Actual rig size and capacity
- (2) Name of drilling contractor
- (3) Name of responsible on-site field geologist
- (4) Spud-in date

EXHIBIT A
 Hillsboro Project (1124)
 Sierra County, New Mexico NMPM

<u>Hole Number</u>	<u>Description</u>	<u>Location</u>			<u>Elevation</u>	<u>AMAX Lease No.</u>	<u>Land Status</u>
		<u>Section</u>	<u>Township</u>	<u>Range</u>			
1124-1	NE/4NE/4	5	16S	7W	5,560'	1124-3001	V.H. Cunningham
1124-2	SE/4NE/4	5	16S	7W	5,480'	1124-3001	V.H. Cunningham
1124-3	SE/4NE/4	5	16S	7W	5,480'	1124-3001	V.H. Cunningham
1124-4	SW/4SW/4	4	16S	7W	5,385'	1124-3001	V.H. Cunningham