GTLT - ____5____

5-16S-7W Sierra County

1124-2 & 1124-3

RAMAN EXPLORATION, INC.



GEOTHERMAL 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-0C-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:

- Geothermal Well Completion Report for each hole which was drilled.
- 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 V	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,

CJH/bsw

AMAX EXPLORATION, INC.

Carolyn & Hollgreeve Carolyn J. Holtgrewe

Permit Assistant

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Operator /	OR PLU	G BACKGEOTHERN	IAL RESOURCES WI	ELL	State Le	//
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2. Name of Operator					9. Well No.	
AMAX Exploration	<u>ı, Inc.</u>				112	4-2
3. Address of Operator					10. Field and	d Pool, or Wildcat
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be at lea	ast one foot be	elow original gi				· · · · · · · · · · · · · · · · · · ·
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hereos certify that the information	above is true and com	plete to the best of my ki	nowledge and belief.			·
Carolyn J. Holt	grewe, Attorn	ey-in-tact			•	
igned lawy fol	grewe	_ Title Permi	<u>t Assistant</u>	I	DateNOV	ember 19, 1981
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b. Type of Well	Geotherr	nal Producer 🔲	Ter	np Observation 🕅 🕅		8. Farm or 1	Lease Name
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3. Address of Operato	r					10. Field an	d Pool, or Wildcat
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		Well Low Ter	mperature Well o	or Geothermal Ob	servatio	n Well B	Bond
				CEMENT PROGRAM			
SIZE OF HOL	E	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	SACKS OF	CEMENT	EST. TOP
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I hereby certify that the Carolyn Signed	e information J. Holt J. Holt	above is true and con grewe , Attorn grewe	iplete to the best of my kr iey-in-fact Permit	nowledge and belief.	<i>D</i>	ate <u>Nove</u>	ember 19, 1981
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	Carl	Ulway-		COLEUM GEOLOGIST	C	ate <u>11 /</u>	/24/81
CONDITIONS OF APPI	NUVAL, IF	- (N Y :					

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Operator	All dista	nces must be from the ou Lease	ater boundaries of the Sect	Hon 3 3 1991 Well No.
AMAX E	xploration, Inc.		Private (1124-	3001.)
hit Letter	Section Township	Rang	e County	SARITA FF
<u> </u>	5	16S	7₩	<u> </u>
Actual Footage Locati	on of Well:	line and	20 fact from t	the Fact line
Ground Level Elev.	Producing Formation	Pool	<u>50</u> reet nom	Dedicated Acreage:
5.480' GR	N/A		N/A	. N/A Acres
1. Outline th	he acreage dedicated to the s	ubject well by colored	pencil or hachure marl	ks on the plat below. N/A
.2. If more t and royal	han one lease is dedicated t ty). N/A	to the well, outline ea	ch and identify the ow	vnership thereof (both as to working interest
3. If more t communit	han one lease of different of ization, unitization, force-po No If answer is "yo	ownersip is dedicated ooling, etc? N/A es," type of consolidat	to the well, have the i	nterests of all owners been consolidated by
If answer is necessary.)	"no," list the owners and t	ract descriptions which	1 have actually been co	onsolidated. (Use reverse side of this form if
No allowable forced-poolin	e will be assigned to th g, or otherwise) or until a ne	e well until all inte on-standard unit, elimi	rests have been conse nating such interests, h	olidated (by communitization, unitization as been approved by the Commission.
	1		t .	CERTIFICATION
	C	B	A	I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.
E		G		Name Carolyn J. Holtgrewe Carolyn J. Holtgrewe Position Actorney-in-fact Permit Assistant Company AMAX Exploration, Inc. Date November 19, 1981
	K	J	Ţ	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.
M			P	Date Surveyed Registered Professional Engineer and/or Land Surveyor
0 330 060 a	0 1320 1650 1980 2310 26	40 2000 1500	1000 500	Certificate No.

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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 letterhead 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



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		Locatior	_			AMAX	
Hole Number	Description	Section	Township	Range	Elevation	Lease No.	Land Status
1124-1	NE/4NE/4	5	165	ΜĹ	5,560'	1124-3001	V.H. Cunningham
1124-2	SE/4NE/4	ß	16S	ΜĹ	5,480'	1124-3001	V.H. Cunningham
1124-3	SE/4NE/4	5	16S	ΜĹ	5,480'	1124-3001	V.H. Cunningham
1124-4	SW/4SW/4	4	16S	ΜĹ	5,385'	1124-3001	V.H. Cunningham

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1a. Type of Work	Drill 🕅	X	D	eepen`		Plug Back			7. Unit Agr N	eement Name	
b. Type of Well	Geotherr	mal Producer			Tem	p Observation			8. Farm or	Lease Name	
	Low-ren							·····	No. Well No.	/A	
2. Name of Operator <u>AMAX Ex</u>	olorati	on, Inc.							9. weir Rd. 11	24-3	
3. Address of Operator			÷.		0401				10. Field an	d Pool, or Wib	dcat
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I here certify that the	informatio	on above is true	and com	lete to the hest o	f mv kn	owledge and be	lief		<u></u>	<u> </u>	
Carolyn	J. Holt	tgrewe, At	torney	/-in-fact		omouge and Ot			•••		
igned <u>(arolyn</u>	1 J H	ollgrei	NU	TitlePe	rmit /	Assistant			Date <u>NO</u>	vember 19	, 1981
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b. Type of Well	Geotherma	al Producer			Ten	np Observation	XX	-	8. Farm or	Lease Name	
	Low-Temp	o Thermal			Injec	ction/Disposal			Ν	/A	
2. Name of Operator									9. Well No.		
AMAX Exp	oloratio	n, Inc.							11	24-3	
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21. Elevations (Show v	whether DF, 1	RT, etc.)	1A. Kind	& Status Plug. Bo	nd 21	B. Drilling Contr	ractor	·	22. Appro	x. Date Wor	k will start
9	W	ell Low	Tempe	rature Well Roposed casing	or Ge G AND	eothermal (CEMENT PROG	Obser RAM	vation W	ell Bond		01
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4-3/4" - 6-3	3/4"	N/A		N/A		N/A			N/A	N/	A
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		All distances must b	e from the oute	er boundaries	of the Section	n.		
erator			Lease			VOV 33	Well No.	
AMAX Explo	oration, Inc	•	Pri	ivate (1	124=3001)		24-3
it Letter Sec	tion ך ג	Fownship 16S	Range	74	County	Si'er	ira U.v.	
tual Footage Location	of Well	105	l	/ ٧٧		SANTA		
260	feet from the	North 1	ne and 10)	feet from the	Fast	line	
ound Level Elev.	Producing Forma	tion	Pool	·		2430	Dedicated Acrea	ge:
5,480' GR	N	/A		Ń	/A		N/A	Acres
1. Outline the	acreage dedicated	l to the subject wel	l by colored p	pencil or hac	hure marks	on the plat	below. N/A	
 and royalty) 3. If more tha communitiz Yes If answer is "n necessary.) 	• N/A n one lease of d ation, unitization] No If answ o," list the owne	ifferent ownersip is , force-pooling, etc wer is "yes," type o ers and tract descrip	dedicated to N/F f consolidatio ptions which) the well, h A on have actuall	ave the int	erests of all	owners been c Jse reverse side	of this form
forced-pooling,	or otherwise) or	until a non-standard	1 unit, elimina	ating such in	terests, has	l hereby contained the best	CERTIFICAT CERTIFICAT y certify that t d herein is true a of my knowledge	ION ION the information and complete to and belief.
E			 イ			Name Ca Position At Position At Per Company AMAX Date Novem	rolyn J. H yn J <i>. Hol</i> torney-in- mit Assist Exploratio ber 19, 19	oltgrewe <i>lgrewe</i> fect ant n, Inc. 81
		_	- -		_	I hereby	/ certify that th n this plat was pl	e well location
	K)		-	snown o notes of under m is true knowled	actual surveys r y supervision, an and correct to t ge and belief.	nade by me o d that the same the best of my

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 letterhead 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

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		Location	_			AMAX	
Hole Number	Description	Section	Township	Range	Elevation	Lease No.	Land Status
1124-1	NE/4NE/4	5	165	ΜĹ	5,560'	1124-3001	V.H. Cunningham
1124-2	SE/4NE/4	2	16S	ΜĹ	5,480'	1124-3001	V.H. Cunningham
1124-3	SE/4NE/4	5	16S	λW	5,480'	1124-3001	V.H. Cunningham
1124-4	SW/4SW/4	4	16S	ΜĹ	5,385'	1124-3001	V.H. Cunningham

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