GTLT - ____4

AmeriCulture Nos. 3 & SEA-1 ULs: G&A 6&7-25S-19W Hidalgo County

DRILLED: 2002 & 1996

Hi Roy, Sorry So long. Let he know if there are any deficiencies. Please Keep logs in drawer for 90 daysthanks -Jamon

5-9-02

Wi Roy, Here are the reversed table and figures including the AMEX Temperature gradient holes within 1.0 mile of the injection site. See the foot note under the table for gradient well Construction information. Thanks for everything. Set me know if you need anything else. Jake con Damon Samieght



Department of Energy

Golden Field Office 1617 Cole Boulevard Golden, Colorado 80401-3393

June 12, 2002



TO: Distribution List

FROM: John H. Kersten Acting Manager, Golden Field Office

SUBJECT: PRE-DECISIONAL DRAFT ENVIRONMENTAL ASSESSMENT SMALL-SCALE GEOTHERMAL POWER PLANT AND DIRECT-USE GEOTHERMAL APPLICATION AT AMERICULTURE, INC., COTTON CITY, NM (DOE/EA 1396)

The subject pre-decisional draft environmental assessment (EA) is enclosed for your review. The Department of Energy, Golden Field Office has prepared this document in accordance with the National Environmental Policy Act (NEPA) and DOE's NEPA implementing regulations. DOE distributed a request for public and agency comments dated November 1, 2001, to approximately 25 federal, state, and local agencies, interested organizations, and individuals. DOE received two comments in response to this request. These comments have been incorporated into the draft EA.

Proposed Action

DOE's Proposed Action is to provide partial funding for two project components located within the Lightning Dock Known Geothermal Resource Area near Animas and Cotton City, NM, approximately 16 miles southwest of Lordsburg, NM. The Proposed Action would use an existing geothermal well (AmeriCulture State 1), which is currently used for heating AmeriCulture's fish hatchery operation. The first project component would involve the construction and operation of a small-scale (approximately one megawatt) geothermal power plant. The second project component would utilize either geothermal fluid directly from the existing well or geothermal fluid exhausted from the new power plant as the heating source for the hatchery. Spent fluid would be re-injected into the geothermal reservoir.

Request for Comments

Consistent with NEPA implementing guidelines, it is DOE's policy to integrate community and public concerns into its decision-making processes. Comments on this draft EA will be accepted for a period of 30 days. Please submit any comments by Friday, July 12, 2002, to:

Steve Blazek NEPA Compliance Officer DOE Golden Field Office 1617 Cole Boulevard Golden, CO 80401-3393 (303) 275-4723 (303) 275- 4788 (fax) steve_blazek@nrel.gov

DOE will review and consider all comments prior to making any final decision. Thank you for your interest and participation in DOE's NEPA process.

Sincerely.

John H. Kersten Acting Manager, Golden Field Office

Distribution: Damon Seawright, AmeriCulture Henry Mlcak, Exergy, Inc. Mark Morolli, Exergy Dale Burgett Thomas W. McCants Peter Maggiore, NMED Micheal P. Jansky, EPA Joseph Torrez, BLM Rodger Anderson, NMOCD Roy Johnson, NMOCD Tim Gum, NMOCD Mike Matush, NMSLO Office of the State Engineer Tommy Townsend, Phelps Dodge

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NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON Governor BETTY RIVERA Cabinet Secretary

Administrative Order No. GIW-15

Lori Wrotenbery Director Oil Conservation Division

THE APPLICATION OF AMERICULTURE, INC. FOR ONE GEOTHERMAL INJECTION WELL, HIDALGO COUNTY, NEW MEXICO

ADMINISTRATIVE ORDER OF THE OIL CONSERVATION DIVISION

Under the provisions of Rule 503 of the New Mexico Oil Conservation Division Rules and Regulations, Geothermal Resources, AmeriCulture, Inc. made application on April 11, 2002 for authority to complete for injection purposes into a geothermal reservoir its AmeriCulture, Inc. Well No. 3 located in Unit G, Section 6, Township 25 South, Range 19 West, NMPM, Hidalgo County, New Mexico.

THE DIRECTOR FINDS THAT:

(1) The application has been duly filed pursuant to the provisions of the Geothermal Resources Rules and Regulations.

(2) That all offsetting owners of geothermal leases within a one-half mile radius of the proposed injection well have been notified by Certified Mail.

(3) All the requirements of Rule 503 have been complied with.

(4) The proposed injection well is in the interest of conservation and will prevent waste and protect correlative rights and that the subject well is cased and cemented and shall be equipped in such a manner as to prevent danger to natural resources including geothermal resources, underground water supplies and surface resources.

(5) The proposed geothermal injection well should be approved.

IT IS THEREFORE ORDERED THAT:

(1) The applicant herein, AmeriCulture, Inc., is hereby authorized to complete its AmeriCulture, Inc. Well No. 3 located in Unit G, Section 6, Township 25 South, Range 19 West, NMPM, Hidalgo County, New Mexico, in such a manner as to permit the injection of fluids into the Gila Conglomerate through a perforated interval located from 150 feet to 300 feet.

(2) Injection shall be through tubing and surface injection pressure shall not exceed 20 psi.

Administrative Order GIW-15 June 17, 2002 Page 2

(3) Monthly injection for the above-described well shall be filed with the Division in accordance with Rule 210 of the Geothermal Resources Rules and Regulations.

(4) The applicant will obtain and file with the Division's District Office a water analysis of the proposed injection zone prior to any injection of fluids.

(5) Surveillance of the above-described well shall be conducted as required by Rule 505 of the Geothermal Rules and Regulations to ensure that all injected fluids are being confined to the intended zone of injection.

IT IS FURTHER ORDERED THAT:

Jurisdiction of this cause is hereby retained by the Division for such further order or orders as may been deemed necessary or convenient for the prevention of waste and/or the protection of correlative rights, and for the protection of natural resources and the environment. Upon failure of the applicant to comply with any requirement of this order, the Division may terminate the authority hereby granted.

APPROVED AT Santa Fe, New Mexico on this 17th day of June, 2002.

STATE OF NEW MEXICO OIL CONSERVATION DIVISION

Wroken

LORI WROTENBERY Director

LW/REJ









Well Number	Total Depth	Interval	Notes
See Fig. 2	ft	ft	
1	200	Not Reported	
2	93	50-90	
3	250	65-100	
4	93	50-90	
5	223	60-223	
6	399	283-399	
7	910	583-910	
8	440	265-440	
9	562	290-562	
10	440	275-440	
11	400	Not Reported	
12	375	280-375	
13	225	90-225	
14	260	122-144	
15	600	90-105	
16	275	Not Reported	
17	275	90-225	
18	115	90-115	
19	85	80-85	
20	175	90-175	
21	130	90-130	
22	110	Not Reported	
23	90	Not Reported	
24	110	6-110	
26	1400	60-223	
27	205	109-205	
25.A	150	45-150	
25.B	83	50-82	
25.C	106	Not Reported	
25.D	95	42-90	
28.A	120	Not Reported	
28.B	32	Not Reported	
29	164	*(see below)	AMEX AN-101
30	162	*(see below)	AMEX AN-103
31	520	*(see below)	AMEX AN-104
32	821	*(see below)	AMEX 672-227
33	1001	*(see below)	AMEX 672-225
34	932	*(see below)	AMEX 672-206
35	177	*(see below)	AMEX AN-105

Table 1. Perforated or open hole intervals for wells within 1.0 mile radius of proposed injection well.

*All AMEX wells were for temperature gradient and heat flow data collection. Wells were cased with either 1" PVC or 2" steel pipe which was capped at the bottom of the string. The annular space was filled with a mixture of some or all of the following: cuttings, slurry, and cement. The casings strings were then filled with fresh water, allowed to equilibrate, and, after temperature logs were taken, were plugged at the surface with cement.

		Open or Perforated	
Well Number	Total Depth	Interval	Notes
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15	600	90-105	
16	275	Not Reported	
17	275	90-225	
18	115	90-115	
19	85	80-85	
20	175	90-175	
21	130	90-130	
22	110	Not Reported	
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Rec'cl 4-11-2002







April 8, 2002

Roy Johnson Senior Petroleum Geologist, Supervisor District IV 1220 S. St. Francis Dr. Santa Fe, NM 87505

Dear Roy,

Please find attached herewith duplicate copies of Form G-112, together with all attachments referred to in Rule G-503, pertaining to proposed drilling and operational activities involving the production of geothermal fluids at our State Geothermal Lease GTR-304-1 and reinjection of said fluids at a suitable location on State of New Mexico Trust Land to the north of our facility.

The fluids will be used for the generation of electricity and direct use purposes. Reinjected fluids will be thermally-depleted, but will otherwise be chemically unaltered from their original state. AmeriCulture, under consultation with Jim Witcher of NMSU, maintains that thermal, chemical, operational, and geological factors favor the proposed injection site location. This is the same location discussed by you, Dale Burgett, and myself in September at the AmeriCulture production facility.

This letter, together with relevant attachments, has been sent to all parties listed below on the copy list. Should you find any deficiencies, please call me and I will remedy the situation immediately. Thank-you.

Sincerely

Damon Seawright Vice President AmeriCulture, Inc.

CC: Jami Bailey, Oil Gas, and Minerals Division of NM State Land Office Amy Leuders, BLM Dale Burgett, Burgett Geothermal, Inc. Roy Cunniff, Lightning Dock Geothermal Inc. Thomas McCants Gary Seawright, AmeriCulture, Inc.

· 通知性的意义是我们的问题。

AmeriCulture Inc.

HC 65 Box 260 C, Animas, NM 88020 Ph: 888.TILAPIA Fax: 505.548.2631 e-mail: americulture@vtc.net • www.americulture.com

STATE OF NEW MEXICO ENERGY AND MINERALS DEPARTMENT

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OIL CONSERVATION DIVISION P. O. BOX 2088 SANTA FE, NEW MEXICO 87501 (*)

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Faps G-112 Adopted 10-1-7 Westsed 10-1-7

APPLICATION TO PLACE WELL ON INJECTION GEOTHERMAL RESORTER ARAN

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ame and Address of Surface Own Burgett Geothermal Inc. (Mr. [or (or Lessee, if Dale Burgett) -	State or Federal Lan Lessee of GTR-303	a) 3; Mr. Thomas McC	ants - Surface Lessee (ag	priculture)
st-Names and Addresses of all Op Burgett Geothermal, Attn:	erators within C Mr. Dale Bi	ine-Half (½) Mile of Irgett; Box 265/	This Injection Well A Animas, NM 8	38020 Phone: (505)-	548-2353
/r. Thomas McCants, Bo	x 265 Anima	is, NM 88020	Phone: (505)-54	8-2260	20
ightning Dock Geotherm	al, Inc. ; Attr	n: Mr. Roy Cunr	niff; 224 W. Gree	ening Ave., Las Cruce	es, NM 88005 Phone
505) 523-7908					Ф 1,427 \$ 1,121 1,122 1,122 1,122 1,122 1,122 1,122 1,122 1,122 1,122 1,122 1,122 1,122 1,122 1,122 1,122 1,12
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c the Following Items Attached is Application (see Rule 503)	to Plat of Are	¥	Electrical Log		Diagrammatic Sketch of Well
	certify that the	information above is	true and complete to	the best of my knowledge :	yes to no coloradore
. 2	Le-	Damo	n E. Seawright, Vic	e President	April 8, 2002
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SAMPLE PROGRESS REPORT SWAT Lab - New Mexico State Univ. Date: 11-10-2000 Time: 15:31:47

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Total Dissolved Solids	1071	mg/L	11/01/00	BJI
Bicarbonate	2.27	meg/L	11/06/00	LJ(
Sodium by ICP-	319	ma/L	11/02/00	BJF
Calcium by ICP-	22.7	mq/L	11/02/00	BUT
Magnesium by ICP-	0.1	mgyL	11/02/00	BJI
Potassium by ICP-	14.7	mq/L	11/02/00	BJ
Chloride by Autoanalyzer	80	mg/L	11/07/00	LJC
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Arsenic by ICP-	Not detected	l mg/L	11/02/00	BUF
S111Ca by LCP	42.0	mg/L	11/02/00	BJE
Strontaum by ICP	0.45	mg/L	11/09/00	BJF
LICATUM BY ICP-				Тх. П
Cron by 1CP-	0.37	mg/B	11/02/00	BJE
TION DY TOP-	1.14	mg/L	11/02/00	BJE
DH OI WATER LCS	8.25		10/30/00	JH
ph of water duplicate	8.11		10/30/00	JH
PH OI WALER RPD	000000		10/31/00	BJH

End of progress report on sample #AB18968

INJECTION WELL EXERGY-AMERICULTURE PROJECT LIGHTNING DOCK KGRA, ANIMAS VALLEY, NEW MEXICO

A geothermal injection well that is suitable for a maximum daily capacity of 1.7 million gallons of 135° F of 1,100 mg/L total dissolved solids (TDS) is proposed to be installed and operated near the center of section 6, Township 25 South, Range 19 West at a location 2,310 feet from the east line of section 6 and 2,700 feet from the south line of section 6 (Figures 1, 2, and 3). The proposed location is located approximately 3,445 feet north northwest of the AmeriCulture 1 State production well and approximately 3,180 feet northwest of the nearest production well, Burgett B. The well is sited in the northwest corner of NM lease GTR-303 and 350 feet inbound of the west and north lease boundaries. The geothermal lessee is Mr. Dale Burgett and the surface agriculture lessee is Mr. Thomas McCants.

The proposed well is located in the western portion of a north-flowing outflow plume of the Lighting Dock geothermal system. Natural outflow plume reservoir temperatures at the injection site are projected to range from 120-160° F at less than 1,000 feet depth. The exact natural chemistry of thermal fluids at this location is not known with certainty. A natural mix of non-thermal fluids and outflow plume geothermal fluids may exist at this site. If so, in situ fluid TDS may be less than the planned 1,100 mg/L injectate. However, chloride and silica concentration maps for alluvial ground water in the Animas Valley outline the outflow plume very well and indicate that the planned injection site is within the dominant geothermal flow to the north (Figures 4 through 7). The proposed injection well site is located within the boundaries of the geochemical and thermal anomaly expressions of the outflow plume.

Pump test data from the AmeriCulture 1 Federal well, regional Bouguer gravity data, and deep borehole data suggest that the injection site is separated from the area of the Burgett and AmeriCulture production wells by an "impermeable" reservoir boundary that probably trends north to northeast along a zone starting at a location between the AmeriCulture Federal well and the AmeriCulture 1 production well. The sharp temperature change along the western boundary of the outflow plume may be reflective of this boundary (Figures 6 and 7). The boundary may be a fault zone or a lateral change in alluvial fan deposits to less permeable deposits toward the basin center. This zone is an impediment to outflow on the west and limits thermal (and chemical) mixing and dispersion. Injection will be done in the "Gila Conglomerate" basin fill and Tertiary volcanics, if the later are encountered.



Figure 1. Local Geothermal leases showing production well and proposed injection well site.



		Open or
		Perforated
Well Number	Total Depth	Interval
See Fig. 2	ft	ft
1	200	Not Reported
2	93	50-90
3	250	65-100
4	93	50-90
5	223	60-223
6	399	283-399
7	910	583-910
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25.D	95	42-90
28.A	120	Not Reported
28.B	32	Not Reported

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Table 1. Perforated or open hole intervals for wells within 1.0 mile radius of proposed injection well.



Figure 3. Diagrammatic sketch of the proposed injection well.



Figure 4. Regional SiO2 concentration map (O'brien and Stone, NM Bureau of Mines Open File Report 131).



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Figure 5. Regional chloride concentration map (O'brien and Stone, NM Bureau of Mines Open File Report 131).



Figure 6. Regional ground temperature (°C) at 1 meter depth at the Lighting Dock Geothermal Anomaly.



Figure 7. Regional ground temperature (°C) at 2 meter depth at the Lighting Dock Geothermal Anomaly.

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OIL CONSERVATION DIVISION P. O. BOX 2088

Forms G-112 Adopted 10-1-7/ Revised 10-1-7;

SANTA FE, NEW MEXICO 87501

APPLICATION TO PLACE WELL ON INJECTION GEOTHERMAL RESOURCES AREA

Lease Name AmeriCultu	re, Inc.	Woll No.	Field Light	tning Dock	Hidald
Location		22001		00501	South
Unit Letter	Well Is Lo	cated ZZ90 Fe	et From The EaSL	Line And 2000	Feel From The
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Punch perforated	9-5/8"	Formation			
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Name of Bronorad Invalues	ation		Tion of Cornel		latton of Formation
Gila Conglome	erate		There's or used as a second		ICCOM OF FORMUUM
is injection Through Jubine, Cash Casing	ng, or Annulus?	Perforations	or Open Hole? Prope Drations	osed Interval(s) of Injectio 150-300'	λ Ω
Is This a New Well Drilled For Injection? Yee	if Answer	is No. For What Purp	ose was Well Originally	Drilled? Has Well Ever E Other Than the	Been Perforaled in Any Zor Proposed Injection Zone?
List All Such Perforated Intervals	and Sacks of G	ment used to Seal Of	t-or-Spuceze Each		- nerne normann angene e generne former likers e velengeblenkinskin i standar. Mit wilder i standard at standard
				· · · · · · · · · · · · · · · · · · ·	4
Depth of Bottom of Deep#st Erest in This Area	n Water Zone	Is This Injection fo or Water Disposal?	Purpose of Pressure A (See Rules 501 and 50	Aaintenance Pressu 2)	re Maintenance
Anticipated Daily Minimum Injection 1,584,000 gal 1,440 Volume	,000 gal	imum 28,000 gal System	Closed Type Is Pro	Injection to be by Gravity issure? Gravity	or Approx. Pressure (
Answer-Yes or No Whether the Fo to such a Denre' as to be Unfit for y Other Connect Use	Domestic, Sto	re Mineralized (Water k, Irrigation,	to be injected i Na NO	tural water in Injection	Are Water Analyses Attach Yes
Name, and Address of Surface Own Burgett Geothermal Inc. (Mr.	er (or Lessee, if Dale Burgett) -	State or Federal Lan Lessee of GTR-30	a) 3; Mr. Thomas McCar	nts - Surfàce Lessee (a	griculture)
List Names and Addresses of all Or Burgett Geothermal: Attn	erators Within Mr. Dale B	one Half (1/2) Mile of	This Injection Well A Animas NIM 88	020 Phone: (505)-	-548-2353
				2000) ⁻	
IVIR. I NOMAS IVICUANTS; BO	x 205 Anim				
Lightning bock Geotherm (505) 523-7908	iai, iric. ; Ati	.n. ivii. ∖koy ⊂uhr	iiii; ∠∠4 vv. Green	ing Ave., Las Cruc	es, INIVI 66005 PHC
					9 • • • • • • • • • • • • • • • • • • •
			arte de la constante de la cons La constante de la constante de La constante de la constante de		
Have Copies of this Application Be	en 1				
Hall Mile of this Well?	Ŷēs	<u>No D</u>			
Are the Following Items Attached his Application (see Rule 503)	to Plat of Arc	, Xi□	, ⊨lectrical Log∈	X	Biggrammatic Sketch of We
Ihereby	certify that the	information above is	true and complete to the	te best of my knowledge.	and belief.
				Brooidact	
	Store -	Jamo	The Seawinght, vice.		April 8, 2002 (Date)

by the Division's Santa Fig. affire. If at the end of the 20-day waiting period no protest has been received by the Santa Fe office, the application will be produced by the Santa Fe office, our

SAMPLE PROGRESS REPORT ate Univ 15:31:47

SWAT Lab - New Mexico State Univ. Date: 11-10-2000 Time: 15 31:47

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Status: Analyses incomplete Purchase order number: User Code No : Client Code: WITCHER Sample collector: JAMES WITCHER	Date collect Date submitt Due date: 11 Specificatio sample descr	ed: 10/30/00 ed: 10/30/00 /27/00 n checking: off iption: Seawrig	ht Geothermal
Req ID#:	Submit:		
Analysis	Result	Unit	Finished An)
pH of water	8.11		10/30/00 JH
Total Dissolved Solids	1071	-ma/L	11/01/00 BJF
Bicarbonate	2.27	meg/L	11/06/00 LJC
Sodium by ICP-	31.9	mg/L	11/02/00 BJ
Calcium by ICP-	22 7	mg/L	11/02/00 BJH
Magnesium by ICP-	20018 × 2	mg/L	11/02/00 BJ
Potassium by ICP-	14.7	mg/L	11/02/00 BJF
Chloride by Autoanalyzer	80	mg/L	11/07/00 LJG
Sullate show of the second states	462	mġi∕1	- 11/02/00 RLM
riuoride by electrode			
Bromide by ion Chrom-	Not detected	mg/L	11/01/00 HM
ADSENIC by ROP-	Not detected	mg/L	11/02%00 部5
Cracket by there	4.20	mg/L	-11/02/00 BUE
SLIGHTAUM OV ICP	0.45	mg/L	11/09%00 BUH
Erchaum by rep-		1999년(1987년) 일상 - 1997년) - 중 1977년(1997년) - 1997년)	en an an an ann an an an an an an an an a
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INJECTION WELL EXERGY-AMERICULTURE PROJECT LIGHTNING DOCK KGRA, ANIMAS VALLEY, NEW MEXICO

A geothermal injection well that is suitable for a maximum daily capacity of 1.7 million gallons of 135° F of 1,100 mg/L total dissolved solids (TDS) is proposed to be installed and operated near the center of section 6, Township 25 South, Range 19 West at a location 2,310 feet from the east line of section 6 and 2,700 feet from the south line of section 6 (Figures 1, 2, and 3). The proposed location is located approximately 3,445 feet north northwest of the AmeriCulture 1 State production well and approximately 3,180 feet northwest of the nearest production well, Burgett B. The well is sited in the northwest corner of NM lease GTR-303 and 350 feet inbound of the west and north lease boundaries. The geothermal lessee is Mr. Dale Burgett and the surface agriculture lessee is Mr. Thomas McCants.

The proposed well is located in the western portion of a north-flowing outflow plume of the Lighting Dock geothermal system. Natural outflow plume reservoir temperatures at the injection site are projected to range from 120-160° F at less than 1,000 feet depth. The exact natural chemistry of thermal fluids at this location is not known with certainty. A natural mix of non-thermal fluids and outflow plume geothermal fluids may exist at this site. If so, in situ fluid TDS may be less than the planned 1,100 mg/L injectate. However, chloride and silica concentration maps for alluvial ground water in the Animas Valley outline the outflow plume very well and indicate that the planned injection site is within the dominant geothermal flow to the north (Figures 4 through 7). The proposed injection well site is located within the boundaries of the geochemical and thermal anomaly expressions of the outflow plume.

Pump test data from the AmeriCulture 1 Federal well, regional Bouguer gravity data, and deep borehole data suggest that the injection site is separated from the area of the Burgett and AmeriCulture production wells by an "impermeable" reservoir boundary that probably trends north to northeast along a zone starting at a location between the AmeriCulture Federal well and the AmeriCulture 1 production well. The sharp temperature change along the western boundary of the outflow plume may be reflective of this boundary (Figures 6 and 7). The boundary may be a fault zone or a lateral change in alluvial fan deposits to less permeable deposits toward the basin center. This zone is an impediment to outflow on the west and limits thermal (and chemical) mixing and dispersion. Injection will be done in the "Gila Conglomerate" basin fill and Tertiary volcanics, if the later are encountered.



Figure 1. Local Geothermal leases showing production well and proposed injection well site.



		Open or
		Perforated
Well Number	Total Depth	Interval
See Fig. 2	ft	ft
1	200	Not Reported
2	93	50-90
3	250	65-100
4	93	50-90
5	223	60-223
6	399	283-399
7	910	583-910
8	440	265-440
9	562	290-562
10	440	275-440
11	400	Not Reported
12	375	280-375
13	225	90-225
14	260	122-144
15	600	90-105
16	275	Not Reported
17	275	90-225
18	115	90-115
19	85	80-85
20	175	90-175
21	130	90-130
22	110	Not Reported
23	90	Not Reported
24	110	6-110
26	1400	60-223
27	205	109-205
25.A	150	45-150
25.B	83	50-82
25.C	106	Not Reported
25.D	95	42-90
28.A	120	Not Reported
28.B	32	Not Reported

Table 1. Perforated or open hole intervals for wells within 1.0 mile radius of proposed injection well.



Figure 3. Diagrammatic sketch of the proposed injection well.



Figure 4. Regional SiO2 concentration map (O'brien and Stone, NM Bureau of Mines Open File Report 131).



Figure 5. Regional chloride concentration map (O'brien and Stone, NM Bureau of Mines Open File Report 131).



Figure 6. Regional ground temperature (°C) at 1 meter depth at the Lighting Dock Geothermal Anomaly.



3

Figure 7. Regional ground temperature (°C) at 2 meter depth at the Lighting Dock Geothermal Anomaly.



Department of Energy

Golden Field Office 1617 Cole Boulevard Golden, Colorado 80401-3393

June 12, 2002 .

TO: Distribution List

FROM: John H. Kersten Acting Manager, Golden Field Office

SUBJECT: PRE-DECISIONAL DRAFT ENVIRONMENTAL ASSESSMENT SMALL-SCALE GEOTHERMAL POWER PLANT AND DIRECT-USE GEOTHERMAL APPLICATION AT AMERICULTURE, INC., COTTON CITY, NM (DOE/EA 1396)

The subject pre-decisional draft environmental assessment (EA) is enclosed for your review. The Department of Energy, Golden Field Office has prepared this document in accordance with the National Environmental Policy Act (NEPA) and DOE's NEPA implementing regulations. DOE distributed a request for public and agency comments dated November 1, 2001, to approximately 25 federal, state, and local agencies, interested organizations, and individuals. DOE received two comments in response to this request. These comments have been incorporated into the draft EA.

Proposed Action

DOE's Proposed Action is to provide partial funding for two project components located within the Lightning Dock Known Geothermal Resource Area near Animas and Cotton City, NM, approximately 16 miles southwest of Lordsburg, NM. The Proposed Action would use an existing geothermal well (AmeriCulture State 1), which is currently used for heating AmeriCulture's fish hatchery operation. The first project component would involve the construction and operation of a small-scale (approximately one megawatt) geothermal power plant. The second project component would utilize either geothermal fluid directly from the existing well or geothermal fluid exhausted from the new power plant as the heating source for the hatchery. Spent fluid would be re-injected into the geothermal reservoir.

Request for Comments

Consistent with NEPA implementing guidelines, it is DOE's policy to integrate community and public concerns into its decision-making processes. Comments on this draft EA will be accepted for a period of 30 days. Please submit any comments by Friday, July 12, 2002, to:

Steve Blazek NEPA Compliance Officer DOE Golden Field Office 1617 Cole Boulevard Golden, CO 80401-3393 (303) 275-4723 (303) 275- 4788 (fax) steve blazek@nrel.gov

DOE will review and consider all comments prior to making any final decision. Thank you for your interest and participation in DOE's NEPA process.

Sincerely,

John H. Kersten Acting Manager, Golden Field Office



Distribution: Damon Seawright, AmeriCulture Henry Mlcak, Exergy, Inc. Mark Morolli, Exergy Dale Burgett Thomas W. McCants Peter Maggiore, NMED Micheal P. Jansky, EPA Joseph Torrez, BLM Rodger Anderson, NMOCD Roy Johnson, NMOCD Tim Gum, NMOCD Mike Matush, NMSLO Office of the State Engineer Tommy Townsend, Phelps Dodge

Form G-107 Adopted 10-1-74 Revised 10-1-78

STATE OF NEW MEXICO ENERGY AND MINERALS DEPARTMENT

1

11/19/01

011 Conservation Div. 2040 Pacheco St. Santa Fe, NM 87505

GEOTHERMAL RESOURCES WELL HISTORY

Operator	AmeriCulture, Inc. Address HC 65 Box 260C, Animas, NM 88020
Lease Name	AmeriCulture, Inc.
Unit Letter	B Sec. 7 Twp. 25S Bge 19W
Reservoir	Lightning Dock

It is of the greatest importance to have a complete history of the well. Use this form to report a full account of all important operations during the drilling and testing of the well of during re-drilling, altering of casing, plugging, or abandonment with the dates thereof. Be sure to include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests shooting, and initial production data and zone temperature. (Attach additional sheets if necessary.)

Date		
10/20/01		Spudded well, using 20" bit. Drilled to 270' in alluvium; to 284 in Gila Conglomerate transitional unit
thru		and to 292' in Gila Conglomerate using 20" bit using bentonite mud. Set 16" casing to 1 ft off
10/23/01		bottom, Circulated cement (160? sacks) in annulus, and verified top of cement by circulation
	. +?	

	returns.
10/24/01 thru 10/30/01	Waited on cement set.
10/31/01 thru 11/13/01	Resumed drilling to 581' using 14-3/4" bit and air/foam as circulation fluid at 1,350 cfm and 350 psi. First major fracture confirmed by surface water returns at 293'. Very slow penetration rate to 370', moderate to 417', and fast to 581'. Major fractures at 370' and 393' with fault zone at 379' to 382'. Set 12-3/4" casing to 581'. Flow steady but not measured. Spot temperature measurements ranged from 195-210 F
11/14/01	

- 11/1 Cementing preparation and Halliburton mobilization thru
- Casing spot cemented by Halliburton (30 sacks) approximately 100' between calculated depth of 11/20/01 481' and borehole TD of 581'.

11/21/0	1	Wa	aited o	on ce	men	t set			s (ann (ng Status) Status (ng St	uniprotesii d aaris jiikko a							 · · ·		<u>.</u>	anii in the factor of the	 	
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Drilling commenced on November 24, 2001 to 910' with bentonite mud and 11-7/8" bit through 11/24/01 conglomerate/fill to 645', rhyolite to 860', and welded tuff to bottom. Lost circulation at 745' to 755', thru 785' to 805', and 830' to 860' requiring LCM. Borehole left full of heavy mud enriched with drispac 11/29/01 to stabilize hole until drilling resumed in future, and to facilitate future logging efforts.

CERTIFICATION

I hereby certify that the information given above and the data and material attached hereto are true and complete to the best of my knowledge and belie

Vice President

2-05-02

Date

Signed Position

STATE OF NEW MEXICO. ENERGY AND MINERALS DEPARTMENT

1.285

0il Conservation Div 2040 Pacheco St. Santa Fe, NM 87505



Form G-106 Adopted 10-1-74 Revised 10-1-78

GEOTHERMAL RESOURCES WELL SUMMARY REPORT

Ope	rator	AmeriC	ulture, Inc.			Ác	Idress]	HC 65 Box 260	C, Animas, N	<u>VM 8802</u>	<u>20</u>	
Lea:	se-Name	AmeriCu B	lture, Inc.	7	<u>() (() ()</u>		11 No 259	A-601-EXPL	. 19\//		17.7747 - Maria Andreas Angelan and a s	
Res	ervoir		Lightning [, Dock		Co	ounty	Hidalg	0			
Com	imenced diti	líng :	October 2	0, 2001			GEOL	LÓGICAL MARKERS	ŝ.	DEPTH		
Con	pleted drilli	ng <u>NG</u>	ovember 29,	_2001			Red Gila			<u>204</u>	********	
Tota	dépth	910	Plugged dep	(h) <u></u>	8 (************************************		Grey H	knyoiite		043		
Juni										~~~.		
Com	menced pro	ducing	(Date)				Geolo	gfc.age at total depth	: <u> </u>	nknown		
	St	afic test					Production	Tesi Data				
Date	Shura	n well head		Total	Mass FI	ow Data			Separato	Separator Data		
•••••	Temp. *1	Pros. Priz	Lbs/Hr	Temp	Pres P	sig: Enthalp:	/ Orifice	Water cuft/Hr	Steam Lbs/Hr	Pres. Psig.	Temp. F	
11/13/0)1		500,000) 205								
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				¢/	ASING	RECORD (P	resent Hole					
Size of Hole	Size of Casing	Weighi of Csg/ßt, C	irade Nev of OT asing Use	d Lapw	less elds⊖	Depth of Shoe	Top of Casing	Number of Sucks Cement	Top of Cement	Com Deter	ent Top mined By	
20"	16"	82.8 lb	nev	v lapv	veld	292'	1' AGL	- 160?	GL	Cir	culation	
4-3/4"	12-3/4"	53.6 lb.	nev	v seam	nless	581'	1' AGI	30	481-581' sp	ot Volur	metric es	
example										5 10-14 (Constant Constant Const		
		<u></u>	(Size, top,	bottom, perfor	PERF	ORATED C	ASING spacing of p	erforation and metho	d.)		**************************************	
			 Business (BC) and EACK Business (BC) and EACK 	esoner van Pryslage. Fred	. W. 19979 ()							

3. 20 Was analysis of effluent made? NO Electrical log depths N/A 0-910'

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3×190.

CERTIFICATION

STR.

I hereby certily that the information given above and the data and material attached hereto are true and complete to the best of my knowledge and belief.

2-05-02 Vice President Position _____ Signed Date

STATE OF NEW MEXICO ENERGY AND MINERALS DEPARTMENT

Oil Conservation Div. 2040 Pacheco St. Santa Fe, NM 87505

GEOTHERMAL RESOURCES WELL LOG

Form G-105 Adopted 10-1-74 Revised 10-1-78

Operator	AmeriCulture, Inc.
Address	HC 65 Box 260C, Animas, NM 88020
Reservoir	Lightning Dock
Lease Nam	e AmeriCulture, Inc
Location: _	825 feet from the Cast line and
	319 feet from the NOrth line Section 7

FORMATIONS PENETRATED BY WELL

DEPTH	ΙΤΟ	Thickness	Drilled or	Recovery	OF CODINTION
Top of Formation	Bottom of Jornation	-THICKNESS	Cored	Recovery	
0'	270'	270'	Drilled	cuttings	TertQuat. Alluvium
270	. 284'	14'	Drilled	cuttings	Tert. Gila Conglomerate transitional unit
284'	645' 645'	361'	Drilled	cuttings	Tert. Gila Conglomerate. Very slow penetration rate to 370', moderate to 417', and fast to 581'. Numerous lost circulation zones.
645'	860'	215'	Drilled	cuttings	Rhyolite; fast penetraton compared to conglomerate'; numerous lost circulation zones
860"	910'	50'	Drilled	cuttings	Welded tuff

Attach Additional Sheets if Necessary

This form must be accompanied by copies of electric logs, directional surveys, physical or chemical logs, water analyses, tests, and temperature surveys (See Rule 205).

CERTIFICATION 2010

Citra de la citra

Mair,

I hereby certify that the information given above and the data and material attached hereto are true and complete to the best of my knowledge and belief

> Vice President Position

February 5, 2002 Date

Depth (feet) ۍ ۍ Temperature (degrees C)

Temperature Log for AmeriCulture A-601-EXPL



STATE OF NEW MEXICO ENERGY AND MINERALS DEPARTMENT 0il Conservation Div. 2040 Pacheco St. Santa Fe, NM 87505

CERTIFICATE OF COMPLIANCE AND AUTHORIZATION TO PRODUCE GEOTHERMAL RESOURCES

Form G-104 Adopted-10-1-74 Revised-10-1-78

10

OWNER OR OPERATOR

AmeriCulture, Inc.

Address HC 65 Box 260C, Animas, NM 88020

TYPE OF WELL

Name

Geothermal Producer. [] Low-Temperature Thermal. [X Injection/Disposal []

REASON FOR FILING

New Well [X] Recompletion []

Change in Ownership [] Designation of Purchaser []

Other (Please Explain) [...]

DESCRIPTION OF WELL

 Lease
 Well
 Name of Name of Name

 Name
 AmeriCulture, Inc.
 No.
 A-601-EXPL
 Reservoir
 Lightning Dock

 Kind of Lease
 Lease
 Lease
 Number
 GTR-304-1

LOCATION

Unit <u>B 825 feet from the</u> east line and <u>319 feet from the</u> north line of

Section _____ Township _____ 25S _____Range ____ 19W-____

County Hidalgo

TYPE OF PRODUCT

NDry Steam and Low Temp. Stoam Water Thermal Water X

DESIGNATION OF PURCHASER OF PRODUCT Name of

Address of Purchaser

Product Will

Be Used For

CERTIFICATE OF COMPLIANCE

I hereby certify that all rules and regulations concerning geothermal resources wells in the State of New Mexico, as promulgated by the Oil Conservation Division of New Mexico, have been complied with, with respect to the subject well, and that the information given above is true and complete to the best of my knowledge and belief.

Position Vice President Date 2/05/02 P. DISTRICT SUPER

SANTA FE, NEW MEXICO 87501	Adopted 10-1-7 Revised 10-1-7
SUNDRY NOTICES AND REPORTS	
	State X Fee
Operator /////	S.a. State Lease No.
	<u> </u>
For Permit (Form G-101) for Such Proposals.	
Cow-Temp Thermal X Injection/Disposal	77 Unit Agreement Name
2. Name of Operator	8. Larm or Lease Name
3 Address of Operator	
HC 65 Box 260C, Animas, NM 88020	A-607-EXPL
4. Location of well Unit Letter B, 319 Feet From The North Linguage 825	Up: Field and Pool, or Wildcat
The <u>east</u> ine, section <u>7</u> Township <u>255</u> Range <u>19W</u> NMPM	
15. Elevation (Show whether DF, RT, GR, etc.)	12. County,
	Hidalgo
NOTICE OF INTENTION TO	
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1	es Proceedy certify (nat the information above is frue and complete to the best of my knowledge and beliefs)	
	SIGNED Vice President DATE February 5, 2002	
	APPROVED BY (Le DAn DISTRICT SUPERVISOR - 5/2/02	1171
<i>,</i> ,.		*

3-15-02 Oli STATE OF NEW MEXICO Form 6-103 ENERGY AND MINERALS DEPARTMENT Adopted 10-1 SA Revised 10-1 NO. OF COPIES RECEIVED DISTRIBUTION File SUN N. M. H. M. Lease 1 45 0.5.6.5 Fee [GEO Operator Land: Office Do Not Use This Form for Proposals to Drill or to Deepen or For Permit ----- (Form G-101) for Such Proposals.) Geothermal Producer 1. Type of well Name Temp all X Low-Temp Thermal 12 Inject Name of Operator. me AmeriCulture, Inc. ire Address of Operator -601-EXP HC 65 Box 260C Ani -A-S-2 3. Location of Wells or Wildcat B, 319 ock UnitLefter Feet From East The Line, Section To 15. Elevatio Check Appropriate Box I NOTICE OF INTENTION TO PERFORM REMEDIAL WORK CASING TEMPORARILY ABANDON ANDONME PULL OR ALTER CASING CAN SERVICE OTHER.

17. Describe Proposed or completed Operations (Clearly state all periment details, and give pertimenet dates, including estimated date of starting a proposed work) SEF RULI 203.

Drilling on welt-A-601-EXPL (to be renumbered A-45-A-S-2) was terminated November 29, 2001 at a total depth of 910' and left full of a 50 viscosity mud enriched with drispac to stabilize the hole for future drilling and facilitate future logging efforts. AmeriCulture may or may not choose not to resume drilling. In either case AmeriCulture desires to pump geothermal fluids from said geothermal well for its operational requirements. Any disposal of spent geothermal fluids will be done according to the terms specified in our recently renewed discharge permit from New Mexico ENMRD or future terms approved of by ENMRD, and as allowed under the pertinent stipulations placed upon AmeriCulture by the New Mexico Office of the State Engineer regarding the quantity, place, and purpose of use of water rights of AmeriCulture. Although some surface discharge is possible, as outlined under our current discharge permit, AmeriCulture intends to use reinjection, whenever practicable, in deference to geothermal resource conservation. AmeriCulture is applying to the New Mexico Office of the State Engineer to permit well A-601-EXPL (to be renamed A-45-A-S-2) as a supplemental well. Such designation would serve to include said well to the group of fresh and geothermal wells from which AmeriCulture is permitted to produce annually water up to its current water rights holdings (1,567.8 acre feet). Approval of this sundry notice will evidence, to the State Engineer, that the OCD approves of directly producing geothermal fluids from well A-601-EXPL according to the terms stated herein.

Vice-President

DISTRICT SUPERVISOR

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TITLE

_{рате} <u>March 15, 200</u>

APPROVED E

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NO. OF CORIES RECEIVED	Adopted Revised
	References and the second sec second second sec
N. M. B. M.	S: Indicate Type of Lease
GEOTHERMAL RESOURCES WELLS	State, 🗴 Fi
Land Office	GTR-304-1
Do Not Use This Form for Proposals to Drill on to Deepen or Plug Back to a Different Reservoir. Use "Application For Permit	
1. Type of well Geothermal Producer Temp. Observation	7. Unit Agreement Name
2. Name of Operator:	8. Carmor Lease Name
Americulture, inc. 3. Address of Operator	
HC 65 Box 260C Animas, NM 88020	renumbered A-45-A-S-2
4. Location of Well Unit Letter	Lightning Dock
East 19W	
NMPM	
4256' RT	Hidalgo
16. Check Appropriate Box To Indicate Nature of Notice, Report or Other D	àta
	ENT REPORT OF:
TEMPORARILY ABANDON	
PULL OR ALTER CASING CHANGE PLANS CASING TEST AND CEMENT JO	
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17. Describe Proposed or completed Operations (Clearly state all pertinent details and give pertinenet dates; inc proposed work USEF RULE 2013. 1	Waing estimated date of startin
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NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON Governor Jennifer A. Salisbury Cabinet Secretary

September 22, 2001

Lori Wrotenbery Director Oil Conservation Division

Well File

Mr. Gary Seawright AmeriCulture, Inc. 190 Central Park Square Los Alamos, NM 87544

Re: \$3,000 Single Well Geothermal Cash Bond AmeriCulture, Inc., Principal Los Alamos National Bank, Depository – Acct No. 0075777230 319' FNL and 825' FEL of Section 7, Township 25 South, Range 19 West, Hidalgo County, New Mexico Bond No. OCD-704

Dear Mr. Seawright:

The New Mexico Oil Conservation Division hereby approves the above-captioned Single-Well Geothermal cash bond.

Sincerely,

Havid K. Brody

DAVID K. BROOKS Assistant General Counsel

DKB/dp

cc: Oil Conservation Division – Santa Fe

Los Alamos National Bank 1200 Trinity Drive Los Alamos, NM 87544

548.2631 Fux#

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STATE OF ENERGY AND MIN	NEW MEXICO ERALS DEPARTMENT	0il Conserv 2040 Pacheo	vation Div co St.		Form G-101 Adopted 10-1-74 Revised 10-1-78
NO. OF COPIES RECE	IVED	Santa Fe,	NM 87505		
DISTRIBUTION					5. Indicate Type of Lease
File		APPLICATION FOR PER	MIT TO DRILL, DEEPE	EN.	STATE X FEE
N.M.B.M.		OR PLUG BACKGEOTHE	RMAL RESOURCES W	/ELL	5,a State Lease No.
U.S.G.S.					GTR-304-1
Uperator Land Office					
1a. Type of Work	Drill 🔀	Deepen	Plug Back		7. Unit Agreement Name
b. Type of Well	Geothermal Produce	r (Temp Observation	•••	8. Farm or Lease Name
	Low-Temp Thermal	X	Injection/Disposal		AmeriCulture
2. Name of Operator	AmeriCulture,	Inc.		-	9. Well No.
3. Address of Operator	HC 65 Box 26	60C, Animas, NM 8802	0	~~~~~	10. Field and Poul, or Wildcat Lightning Dock
4. Location of Well	UNIT LETTER B	LOCATED 319 FEET	FROM THE north	LINE	
AND 825 FE	ET FROM THE east	LINE OF SEC. 7 TWP.	<u>25S rge. 19W</u>	NMPM	
					12. County Hidalgo
	IIIIIIIIIIIIII	<u> </u>	19. Proposed Depth	19A. Formatio	n 20. Rotary or C.T.
<u>UIIIIIIII</u>	<u> </u>		1,500	Horquilla F	ormation? Rotary
21. Elevations <i>(Show</i>) 4265' RT	whether DF, RT, etc.)	21A. Kind & Status Plug. Bond Int. Single well	21.B. Drilling Contractor Jim McBee		22. Approx. Date Work will start 8 Octobert 2001

PROPOSED CASING AND CEMENT PROGRAM

					······ · · · · · · · · · · · · · · · ·
SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	SACKS OF CEMENT	EST. TOP
20"	16"	83	278+/-	328	Circ
			LI.U. I-		
15"	12-3/4"	54	600+/-	30 (spot cement)	
12"	Open hole		1500+/-		
		· · · · · · · · · · · · · · · · · · ·	hanna an		·····

Drill a 20-inch hole (using drilling mud) to rhyolite at 278+/- ft. Case with 16-in casing; cement the annulus to the surface. Drill ahead in the rhyolite at a 15-in hole size using air. After passing out of the rhyolite at about 375 feet and into the underlying sediments (mainly limestone and shale), drill ahead to 600 feet, still using air as the circulating fluid. Run a 600-ft string of 12-3/4-in, 54 lb/ft. Spot cement the bottom 80 ft of the 12-3/4-in casing. Change back to drilling mud as the circulating fluid; drill out the cement inside the casing and pressure-test the cement job and conduct a cement bond log. Drill a 12-in hole to 1500+/- ft, obtaining 3 or 4 spot cores (30-ft long, NX size). Circulate out the drilling mud and replace with water. Clean out borehole with air. Run temperature and geophysical logs.

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.

Date September 20, 2001
DR DATE 9/24/2001

• STATE OF NEW MEXICO ENERGY AND MINERALS DEPARTMENT

ú

Oil Conservation Div. 2040 Pacheco St.

S DEPARTMENT Santa Fe, NM 87505 GEOTHERMAL RESOURCES WELL LOCATION AND ACREAGE DEDICATION PLAT

Form G-102 Adopted 10-1-74 Revised 10-1-78

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Operator		AmeriC	ulture,	Inc.	1.	ease	GTR-30)4-1			Well No.
Unit Letter	В	Section	7	Township	258	Range	19W	County	Hidalgo		
Actual Footag	e Loca 25	tion of Well:	n the	east	line on	d	319	feet from the	north		line
Ground Level	Elev.	Produc	ing Forr	nation	P	ool I	iahtnina	Dock		Dedica	ted Acreage:
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						1			Company	Amer	iCulture, Inc.
	s ==== 1.0.000000 (01000	1 1 1 1 1				1 			Date	epter	nber 20, 2001
	47 A.T. 140								I hereby shown or notes of under my is true a knowledg	certify actual actual super nd co e and p	r that the well location lat was plotted from field surveys made by me or vision, and that the same rect to the best of my peljef.
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NO. OF COPIES REC	EIVED	S	anta Fe,	NM 87505		
DISTRIBUTIO	N					5. Indicate Type of Lease
File		APPLICATI	ON FOR PERI	MIT TO DRILL DE	FPEN	STATE 🗱 FEE
N.M.B.M.		OR PLUG BA	CKGEOTHE	RMAL RESOURCE	S WELL	5.a State Lease No.
U.S.G.S.						GTR-304-1
Operator Land Office						
ta. Type of Work	Drill 🔀	Deepe	n 🖸	Plug Back		7. Unit Agreement Name
b. Type of Well	Geothermal Produc	er 🔲	-	Temp Observation		S. Farm or Lease Name
	Low-Temp Therma	X	ŧ	njection/Disposal	Later I	AmeriCulture
2. Name of Operator	AmeriCulture	, Inc.				9. Well No.
3. Address of Operat	HC 65 Box 2	260C, Animas	, NM 88020)		10. Field and Poul, or Wildcat Lightning Dock
4. Location of Well	UNIT LETTER	A_LOCATED	319 FEET	FROM THE NOR	thline	
AND 825 F	EET FROM THE CAS	t LINE OF SEC. T	TWP.	<u>258 rge. 19</u>	W NMPM	
						12. County Hidalgo
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21. Elevations (Show 4265' RT) whether DF, RT, etc.)	21 A. Kind & Str Int. 5,	itus Plug. Bond	21B. Drilling Contra Jim McBe	ctor e	22. Approx. Date Work will start 8 Octobert 2001
		PROPO	SED CASING A	ND CEMENT PROGE	AM	

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SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	SACKS OF CEMENT	EST TOP
20"	16"	83	278+/-	328	Circ.
15"	12-3/4"		600+/-	30 (spot cement)	
12"	Open hole		1500+/-		and a second second

Drill a 20-inch hole (using drilling mud) to rhyolite at 278+/- ft. Case with 16-in casing; cement the annulus to the surface. Drill ahead in the rhyolite at a 15-in hole size using air. After passing out of the rhyolite at about 375 feet and into the underlying sediments (mainly limestone and shale), drill ahead to 600 feet; still using air as the circulating fluid. Run a 600-ft string of 12-3/4-in, 54 lb/ft. Spot cement the bottom 80 ft of the 12-3/4-in casing. Change back to drilling mud as the circulating fluid; drill out the cement inside the casing and pressure-test the cement job and conduct a cement bond log. Drill a 12-in hole to 1500+/- ft, obtaining 3 or 4 spot cores (30-ft long, NX size). Circulate out the drilling mud and replace with water. Clean out borehole with air. Run temperature and geophysical logs.

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 servicy that the info	multion above is true and complete to r	the best of my knowledge and belie	f.
Sugred	Title	Vice President	Date September 20, 2001
(This spac	u for State Usej		

DATE

TITLE

APPROVED 6	ΙY.	6		
CONDITIONS	Ör	APPROVAL.	٢P	ANY:

STATE OF NEW MEXICO ENERGY AND MINERALS DEPARTMENT

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Oil Conservation Div. 2040 Pacheco St.

ENERGY AND	MINERALS DE	PARTMEN THERMA	n IL RESOUR	2040 Pac Santa Fe CES WELL	heco St. , NM LOCATIO	87505 N AND AC	REAGE DI	EDICATION PL	Form G-102 Adopted 10-1-74 Revised 10-1-78 AT
	n 2000 1016		All distanc	es must be f	rom the outer	boundaries o	of the Sectio	on.	Well Nr.
vperator	Ameri	Culture,	Inc.			GTR-304	-1		
Init Letter E	3 Section	7	Township	25S	Range	19W	County	Hidalgo	
rctual Footage 825	Location of Wel	h:	east	lino	nad 3		faar fram th	north	line
Ground Level El 4265' F	ev. Prod RT	ucing Form Horqu	illa Forma	tion ?	Ppol Li	ghtning D	ock	IDec	licated Acreage: 10 Acres
I. Outl	ine the acreage	e dedicate	d to the sub	oject well b	y colored pe	encil or hac	hure marks	s on the plat belo)W.
2. If m and	ore than one royalty).	lease is d	edicated to	the well, c	outline each	and identif	fy the own	ership thereof (I	both as to working interest
3. If m com	ore than one nunitization,	lease of unitizatio	different ow a, force-poo	vnersip is d ling, etc?	edicated to	the well, h	ave the in	terests of all ow	ners been consolidated by
E answe	'es 🛄 No	If an: t the owr	swer is "yes,	" type of c	onsolidation	ave actually	e been cor	asolidated (Use	reverse side of this form if
necessar	(.)					are account		isonancer (05%	
No allo forced-p	wable will t ooling, or oth	ne assigne erwise) or	ed to the until a non	well until -standard u	all interes nit, eliminat	ts have be ing such in	en consol terests, has	lidated (by con ; been approved	munitization, unitization, by the Division.
						<i></i>		· · · · · · · · · · · · · · · · · · ·	ann annaiche ann ann ann an 1990 ann an 1971 an 1970 ann an ann ann an Annaichean
	1							C	CERTIFICATION
								I hereby co contained he the best of n	ertify that the information rein is true and complete to ny knowledge and belief.
	4						\triangleleft	\Box	
		9		•	······	erra massang mengela ,		^{Name} Dar	non E. Seawright
n de la constante de	2 2011				1			Position Vi	ce-President
								Company An	neriCulture, Inc.
					* *			Date Sep	tember 20, 2001
		2. (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)						I hereby ce shown on th notes of ect under my su is true and knowledge a	rtify that the well location is plat was plotted from field ual surveys made by me or ipervision, and that the same correct to the best of my nd belief.
					African			Date Surveyed	
			ann an san dynafyr y Ger s (sel Andres		. And .			Registered Profe and/or Land Su	essional Engineer rveyor
	l								
New York Street Fr				4		panawan		Certificate No.	

STATE OF NEW MEXICO ENERGY AND MINERALS DEPAR	Oil Conservation DivTMENT2040 Pacheco St.Santa Fe,NM87505	Form G-101 Adopted 10-1-74 Revised 10-1-78
NO. OF COPIES RECEIVED		
DISTRIBUTION		5. Indicate Type of Lease
File	APPLICATION FOR PERMIT TO DRILL, DEEPEN	I, STATE K FEE
N.M.B.M.	OR PLUG BACKGEOTHERMAL RESOURCES WE	LL 5.a State Lease No.
U.S.G.S.		GT 1 - 504 -1
Operator Land Office		
1a. Type of Work Drill	Deepen 🗌 🦳 Plug Back 🗍	7. Unit Agreement Name
b. Type of Well Geothermal Low-Temp	Producer Temp Observation Chermal X Injection/Disposal	8. Farm or Lease Name
2. Name of Operator AMENICULAINE	, Inc. GARY L. SEAWRIGHT, PRESIDEN,	9. Well No.
3. Address of Operator 536 PAU	L PLACE, LOS ALAMOS, NM 87544	10. Field and Pool, or Wildcat 494772006 DOCK
4. Location of Well UNIT LETTER	LOCATED 990 FEET FROM THE EAST	
		12. County HIDALGO
	$\frac{19. \text{ Proposed Depth}}{490}$	9A. Formation 20. Rotary or C.T. UALLEY FILL ROTARY
21. Elevations (Show whether DF, RT 425D MSG	r, etc.) 21A. Kind & Status Plug. Bond 21B. Drilling Contractor	SYSTEMS 22. Approx. Date Work will start MAY 1, 1996

3

PROPOSED CASING AND CEMENT PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	SACKS OF CEMENT	EST. TOP
1274	10 3/4	32.75	100	150	CIRC
	-				
	J				

HOLE WILL BE DRILLED IN VALLEY FILL UNTIL RHYDLINE ROCK IS ENCOUNTREP. DEPTH AT THAT POINT LOULD BE 100 PEET; IF SO, WELL WILL BE CASED ID PEET INTO RHYOLIPE, AND THEN COMPLETED AS OPEN HOLE TO T.D. DEPTH TO RHYOLITE COULD BE 300' +.

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. 1

I hereby cer	tify that the information a	bove is true and complete t	to the best of my knowledge and	belief.	
Signed	ang Dem		PRESIDENT		Date 22 APRIL 1896
APPROVED	(This space for State		DISTRICT SUPE	RVISOR	DATE 10/04 29 1996

STATE OF NEV	V MEXICO LS DEPARTME	0il 0 2040 Santa	Conserv Pachec	vation Div. co_St. NM 87505			F A R	orm G-102 dopted 10-1-74 evised 10-1-78
	GEOTHERM	AL RESOURCES W	ELL LO	CATION AND A	CREAGE DE	DICATION PL	.AT	
Operator		All distances must	Leas	e outer boundaries	of the Section	n.	Well No.	
AMERICILLET	uRE, I.	ve.	Si	ATY LEASS	GTR -30	4- <i>1</i>	509-1	
Unit Letter Sect	ion 7	Township 25 C		Range	County			,,,,,,
A studi Eastage Logation	f Well:	655		110		VAC GO		
Actual Poolage Location (eat from the	Fast	line and	630	feet from the	NORTH	line	
Ground Level Elev.	Producing For	mation	Pool			De	edicated Acreage:	<u></u>
4250	ANIMAS	VALLEY FILL	6	IGATNING P	ock		10	Acres
1. Outline the a	creage dedicat	ed to the subject we	ell by co	lored pencil or ha	chure marks	on the plat be	low.	
 If more than and royalty). If more than communitiza Yes If answer is "no necessary.) 	one lease is one lease of tion, unitizatio No If ar ," list the ow	dedicated to the we different ownersip on, force-pooling, etc nswer is "yes," type ners and tract descr	ell, outlin is dedica c? of conso riptions y	ne each and ident nted to the well, lidation which have actual	ify the owner have the int	ership thereof (erests of all ov solidated. (Use	both as to work	cing interest solidated by this form if
forced-pooling, c	r otherwise) c	or until a non-standa	rd unit, •		nterests, has	l hereby of contained h the best of Contained h the best of Contained Name CARY L Position	by the Division CERTIFICATION certify that the erein is true and my knowledge an Coco SAWRICA	n. information complete to d belief.
				 		Date 22 APR	utret IN 14 1996	د
						I hereby co shown on th notes of ac under my s is true and knowledge a	ertify that the w his plat was plotte tual surveys mac upervision, and to I correct to the and belief.	vell location ed from field le by me or hat the same best of my
						Date Surveyed Registered Prof and/or Land St	fessional Engineer urveyor	
0 330 060 90	1320 1850 19	80 2319 2640	2000	1500 1000	500 0	Certificate No.		

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May 29, 1996

AmeriCulture, Inc. 536 Paul Place Los Alamos, NM 87544

Attention: Gary Seawright

Re: \$2,000 Geothermal Cash Bond AmeriCulture, Inc., Operator Los Alamos National Bank, Depository 630' FNL and 990' FEL of Sec. 7, T-25-S, R-19-W, Hidalgo County Bond No. OCD-576

Dear Mr. Seawright:

The Oil Conservation Division hereby approves the above-referenced geothermal bond effective this date.

Sincerely, WILLIAM J. LEMAY. Director dr/

cc: Oil Conservation Division Roy Johnson - Santa Fe