STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: ☐ Secondary Recovery ☐ Pressure Maintenance ☒ Disposal ☐ Storage
Application qualifies for administrative approval? ☐ yes ☒ no

II. Operator: BTA Oil Producers

Address: 104 S. Pecos, Midland, TX 79701

Contact party: Dorothy Houghton Phone: 915-682-3753

III. Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? ☐ yes ☒ no
If yes, give the Division order number authorizing the project _____.

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

* VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

* X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)

* XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: Dorothy Houghton Title Regulatory Administrator

Signature: Dorothy Houghton Date: 2-19-91

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal. _____

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate Division district office.

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; location by Section, Township, and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;

(3) the formation name and depth with expected maximum injection rates and pressures; and

(4) a notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

BTA OIL PRODUCERS

Pardue -C-, 8808 JV-P
No. 1-SWD
176' FSL & 1550' FWL
N, Sec. 11, T23S, R28E
Eddy County, NM

Form C-108 Attachment

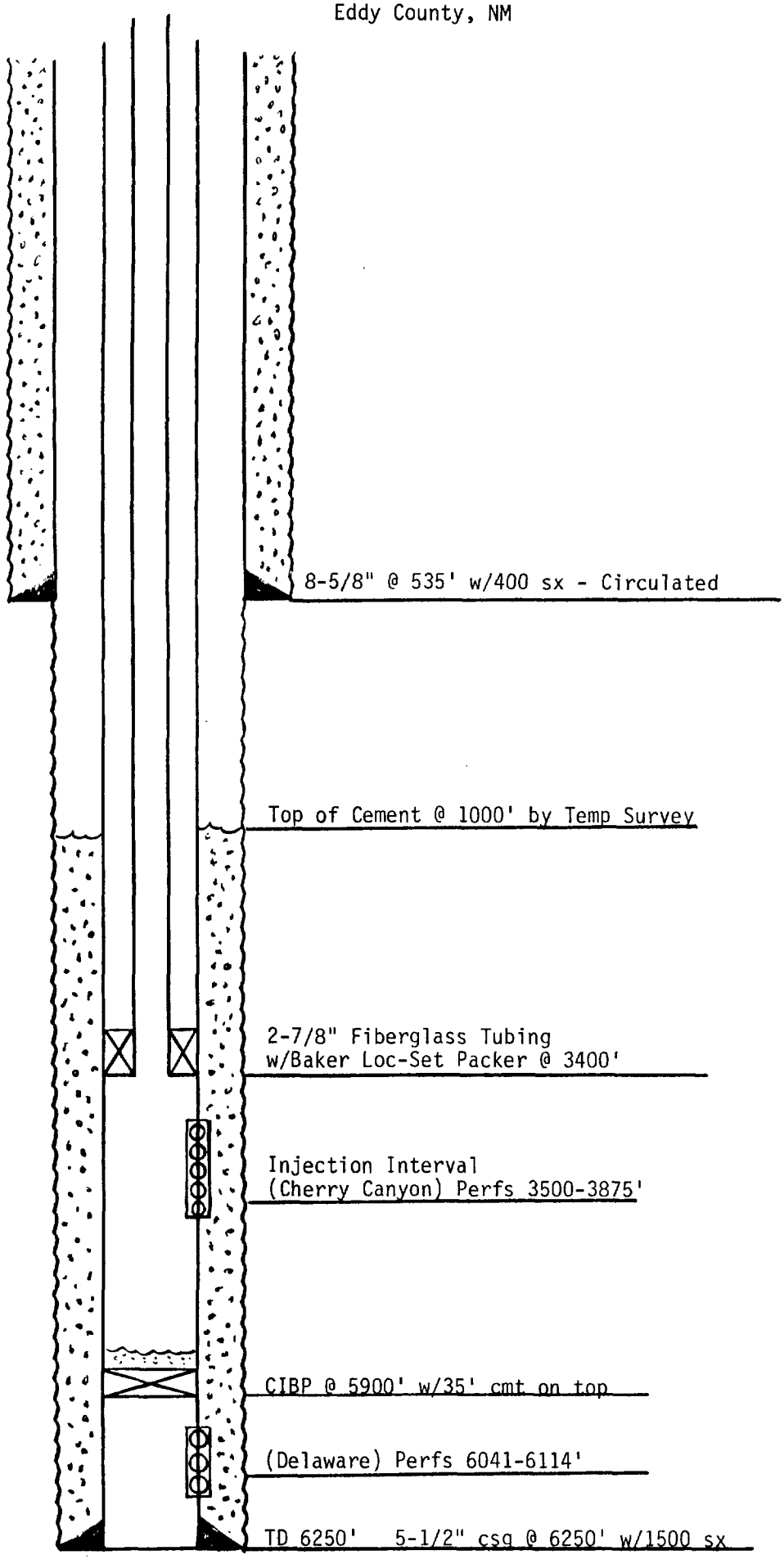
III. Injection Well Data Sheet

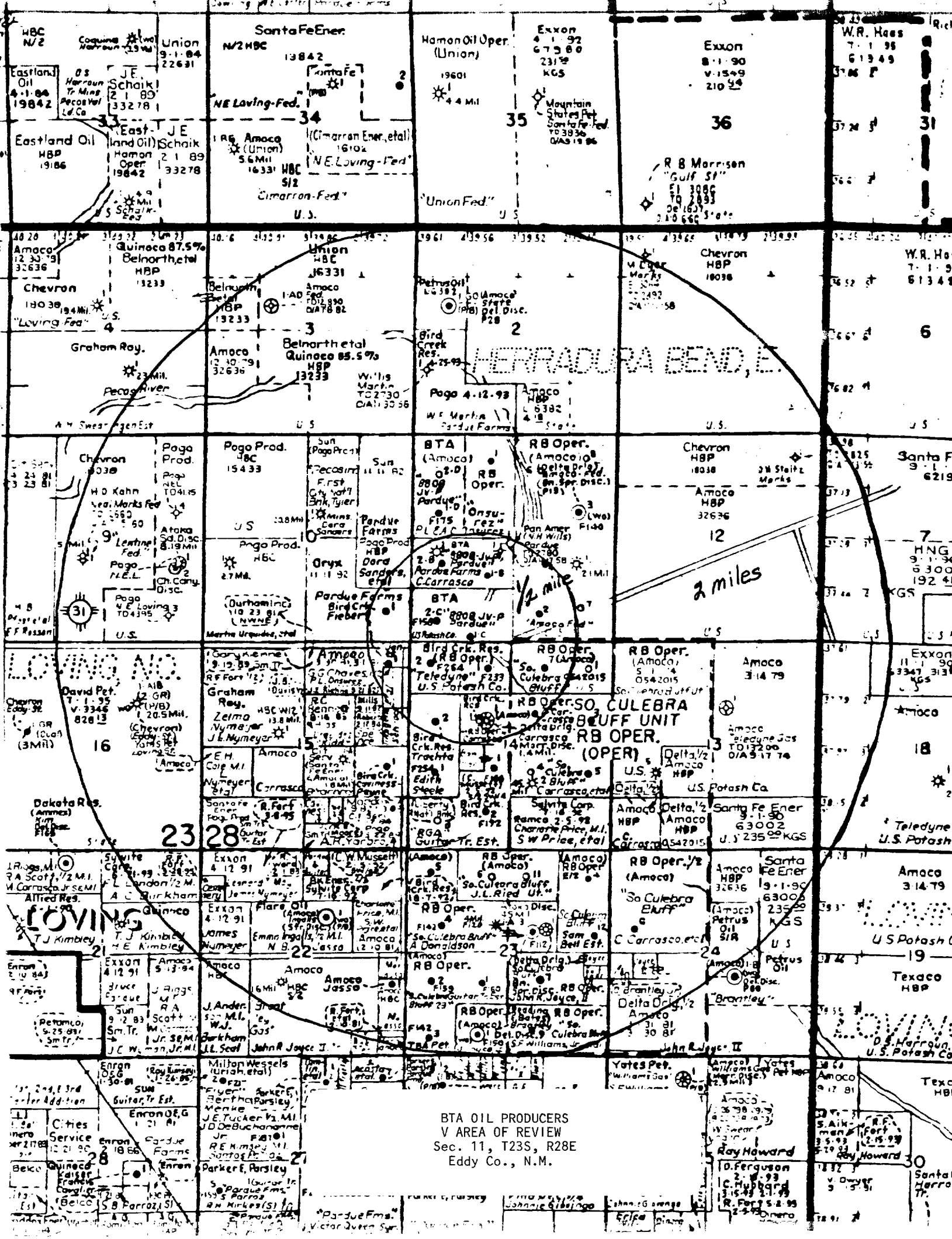
		Hole Size
Surface Casing:	8-5/8" @ 535' w/ 400 sx circ	12-1/4"
Intermediate Casing:	5-1/2" @ 6,250' w/1500 sx TOC @ 1,000' by Temp Survey	7-7/8"
Total Depth:	6,250'	
Tubing:	2-7/8" fiberglass tubing @ 3400'	
Packer:	Baker Loc-set Packer @ 3400'	
Name of Injection Formation:	Cherry Canyon	
Injection Interval:	3,500 - 3,875'	
Field:	Undesignated Cherry Canyon	
Purpose:	This well was drilled by BTA at an unorthodox location and completed 5/17/90. The well produced at a reduced allowable from the Loving East, Delaware Pool. As a result of Order R-9147-B, the well was shut in 2/15/91.	
Perforated Intervals:	6,041 - 6,114'	

Depth and name of overlying and/or underlying oil and gas zones in this area:

Depth to next higher oil zone, 2,600 feet, producing about three and one-half miles northwest. Next lower oil zone, 6,050 feet, producing in Loving East field.

BTA OIL PRODUCERS
Pardue -C-, 8808 JV-P
Proposed SWD - Well No. 1
176' FSL & 1550' FWL
N, Sec. 11, T23S, R28E
Eddy County, NM




HERRADURA BEND E.
LOVING
2 miles
1/2 mile
RB OPER. SO. CULEBRA BLUFF UNIT (OPER)
RB Oper. "So Culebra Bluff"
Pogo Prod. HBC 15433
Chevron HBP 18038
Amoco HBP 32636
Santa Fe Ener. N/2 HBC 13842
Santa Fe Ener. NE Loving-Fed.
Hamon Oil Oper. (Union) 19601
Exxon 4-1-92 G 7580 23159 KGS
Exxon 8-1-90 V-1549 210 44
R B Morrison "Gulf St" El 3086 TD 2693
Union HBC J6331
Quinoco 87.5% Belnorth, etal HBP 13233
Belnorth etal Quinoco 85.5% HBP 13233
Graham Roy.
Pecos River
Petrus Oil LG 382 L 50 (Amoco) State (PB) del. Disc. P28
Bird Creek Res.
Pogo 4-12-93
Amoco HBP L 6382 4-18
W.R. Haas T-1-95 G 1345
Pogo Prod. HBC 15433
Sun (Pogo Prod.)
Pecos Inv. First City Nat'l Bnk, Tyler
Pardue Farms Pogo Prod. HBP Dora Sanders, etal
Oryx 11-11-92
Pardue Farms Bird Crk. Fiebert
Durham Inc. 110 23 81 (NWNE)
Martha Urquidez, etal
BTA (Amoco) 2-D 8800 JV-P Pardue
RB Oper. (Amoco) 10 (Delta Drlg.) Amoco Fed. (Sm. Spr. Disc.) (PB)
Pan Amer (NM Wills) Pardue 2-8 SI A 7558
BTA 2-8 8800 JV-P Pardue Farms C Carrasco
BTA 2-C 8800 JV-P Pardue
Bird Crk. Res. 2 RB Oper. F264 "Teledyne" F233 U.S. Potash Co.
RB Oper. (Amoco) 7 So. Culebra Bluff
RB Oper. (Amoco) 5 0542015
Amoco 3-14-79
Amoco Teledyne Gas TD 13200 D/A 5-17-74
Delta, 1/2 Amoco HBP
U.S. Potash Co.
Santa Fe Ener. 9-1-90 63002 U.S. 2350 KGS
Chevron HBP 18038
H.D. Kahn Neal Marks Fed
Atoka Sd. Disc. 8.19 Mil
Pogo PLE.L.
Ch. Cany. Disc.
Pogo N.E. Loving 3 TD 4395
Graham Roy. Zelma Nymeyer J.L. Nymeyer
Amoco
Carrasco
Bird Crk. Res. Trachta F254 Edith Steele
Bird Crk. Res. 2 F172
Sabvita Corp. Ramco 2-5-98 Charlotte Price, M.I. S.W. Price, etal
Amoco Delta, 1/2 Amoco HBP C Carrasco 0542015
Santa Fe Ener. 9-1-90 63000 2350 KGS
Amoco 3-14-79
Teledyne U.S. Potash
David Pet. 7-1-95 V-3346 828 13
(Chevron) Eddy 32 Yates SR
Dakota Res. (ammex) Kim Fed
Sabvita Corp. 4-12-91
Exxon 4-12-91
Flare Oil (Amoco) (Sm. Disc.) (PB)
Amoco Jasso
Amoco HBC S/2
Amoco HBP 32636 (Amoco) Petrus Oil SIR
Petrus Oil
Brantley
Texaco HBP
D.S. Morrow, U.S. Potash Co.
Quinoco
T.J. Kimbley
H.E. Kimbley
Allied Res.
Petamco 5-25-85 Sm Tr.
Enron 10 E,G 11-30-81 SUB Guitar, Tr Est.
Cities Service 12-21-90
Enron O&G 1-21-81
Pardue Farms
Belco
Quinoco Edisto Francis Corp. (Belco)
S.B. Parrozi, Sr.
Milton Wessels (Uriah, etal)
Fryer
Bertha Parsley
Menke
J.E. Tucker 1/2 Mi.
J.D. DeBuchananne Jr. F 181
R.E. Kimsey M.I.
Santos Pr. Co.
Parker E. Parsley
Guitar Tr
S. Parrozi
R.H. Kirles (S)
"Pardue Fms."
Victor Queen Syn.
Johnnie Gibbings
Eclipse
Yates Pet. "Williams Gas"
Amoco (Williams Gas Mgr. Disc.)
Ray Howard
D. Ferguson 2-8-93
C. Hubbard 3-15-93 2-1-93
R. Parr 5-8-95 2-2-95
Santa Fe
Herro Tr.
Dinero
BTA OIL PRODUCERS
V AREA OF REVIEW
Sec. 11, T23S, R28E
Eddy Co., N.M.

Attachment to C-108

B T A OIL PRODUCERS

VI. Tabulation of Data on all Wells in Review Area

Well: BTA - Pardue -C-, 8808 JV-P, Well No. 2

Location: 560' FSL & 660' FWL
-M-, Sec. 11, T23S, R28E
Eddy County, N.M.

Type: Oil Producer

Construction: 8-5/8" @ 527' w/ 400 sx - Circ
5-1/2" @ 6250' w/1317 sx - Circ

Date Drilled: 2-22-90

Record of Completion: Perfs: 6031 - 6140'
IPF: 158 BO
Comp: 3-08-90

Well: BTA - Pardue -B-, 8808 JV-P, Well No. 2

Location: 1980' FSL & 765' FWL
-L-, Sec. 11, T23S, R28E
Eddy County, N.M.

Type: Oil Producer

Construction: 8-5/8" @ 515' w/ 400 sx - Circ
5-1/2" @ 6250' w/1300 sx - TOC @ 1100'

Date Drilled: 5-14-90

Record of Completion: Perfs: 6055 - 6127'
IPF: 161 BO
Comp: 6-05-90

Well: BTA - Pardue, 8808 JV-P, Well No. 1

Location: 2310' FSL & 660' FEL
-L-, Sec. 11, T23S, R28E
Eddy County, N.M.

Type: Gas Producer

Construction:
16" @ 433' w/ 600 sx - Circ
10-3/4" @ 2614' w/2000 sx - Circ
7-7/8" @ 10700' W/2400 sx - TOC @ 450'
Liner 5" @ 10295 - 12868' w/460 sx

Date Drilled: 8-27-88

Record of Completion:
Perfs: 11604 - 11718'
IPF: 205 MCFD
Comp: 11-24-88

Well: BTA - Pardue -B-, 8808 JV-P, Well No. 1

Location: 1711' FSL & 1957' FWL
-K-, Sec. 11, T23S, R28E
Eddy County, N.M.

Type: Oil Producer

Construction:
8-5/8" @ 514' w/ 400 sx - Circ
5-1/2" @ 6300' w/1200 sx - TOC @ 800'

Date Drilled: 2-06-90

Record of Completion:
Perfs: 6035 - 6120'
IPF: 151 BO
Comp: 2-27-90

Well:	RB Operating Company Amoco "11" Fed, Well No. 4
Location:	1980' FSL & 1651' FEL (Surface) -J-, Sec. 11, T23S, R28E Eddy County, N.M.
Type:	Oil Producer
Construction:	8-5/8" @ 580' w/ 350 sx - Surface 5-1/2" @ 6310' w/1550 sx
Date Drilled:	11-19-90
Record of Completion:	Perfs: 6108 - 6155' IPF: 175 BO Comp: 11-06-90

Well:	RB Operating Company Amoco "11" Fed, Well No. 2
Location:	990' FSL & 1330' FEL (Surface) -O-, Sec. 11, T23S, R28E Eddy County, N.M.
Type:	Oil Producer
Construction:	8-5/8" @ 587' w/ 350 sx 5-1/2" @ 6350' w/1700 sx
Date Drilled:	11-19-90
Record of Completion:	Perfs: 6192 - 6212' IPF: 1137 BO Comp: 12-14-90

Well: RB Operating Company
S. Culebra Bluff, Well No. 7

Location: 660' FNL & 1740' FEL
-B-, Sec. 14, T23S, R28E
Eddy County, N.M.

Type: Oil Producer

Construction: 8-5/8" @ 500' w/ 220 sx - Circ
5-1/2" @ 7478' w/1320 sx

Date Drilled: 8-27-81

Record of Completion: Perfs: 6282 - 7404 (Bone Spring)
IPF: 59 BO
Comp: 11-18-81

Date Re-Entry: 6-13-90

Record of Completion: Perfs: 6079 - 6155
IPF: 198 BO
Comp: 6-24-90

Well: RB Operating Company
Carrasco "14", Well No. 2

Location: 1806' FNL & 2013' FEL
-G-, Sec. 14, T23S, R28E
Eddy County, N.M.

Type: Oil Producer

Construction: 8-5/8" @ 562' w/ 350 sx - Circ
5-1/2" @ 6300' w/1650 sx

Date Drilled: 4-10-90

Record of Completion: Perfs: 6070 - 6163'
IPF: 39.6 BO
Comp: 5-02-90

Well:	Bird Creek Resources, Inc. Carrasco, Well No. 1
Location:	1980' FNL & 1880' FWL -F-, Sec. 14, T23S, R28E Eddy County, N.M.
Type:	SI Gas Well
Construction:	8-5/8" @ 520' w/ 550 sx 5-1/2" @ 6420' w/1245 sx
Date Drilled:	5-15-89
Record of Completion:	Perfs: 6086 - 6190' IPF: Comp: 7-15-89

Well:	Bird Creek Resources, Inc. Trachta, Well No. 2
Location:	1980' FNL & 660' FWL -E-, Sec. 14, T23S, R28E Eddy County, N.M.
Type:	Oil Producer
Construction:	8-5/8" @ 514' w/ 310 sx 5-1/2" @ 6221' w/1490 sx
Date Drilled:	8-24-90
Record of Completion:	Perfs: 6072 - 6133' IPF: 240 BO Comp: 9-14-90

Well:	Bird Creek Resources, Inc. Teledyne, Well No. 1
Location:	660' FNL & 1980' FWL -C-, Sec. 14, T23S, R28E Eddy County, N.M.
Type:	Oil Producer
Construction:	8-5/8" @ 518' w/ 350 sx 5-1/2" @ 6205' w/2350 sx
Date Drilled:	12-28-89
Record of Completion:	Perfs: 6062 - 6143' IPF: 233 BO Comp: 1-13-90

Well:	Bird Creek Resources, Inc. Teledyne, Well No. 2
Location:	660' FNL & 660' FWL -D-, Sec. 14, T23S, R28E Eddy County, N.M.
Type:	Oil Producer
Construction:	8-5/8" @ 500' w/ 350 sx 5-1/2" @ 6187' w/1720 sx
Date Drilled:	5-06-90
Record of Completion:	Perfs: 6014 - 6096' IPF: 264 BO Comp: 5-25-90

Well:	Bird Creek Resources, Inc. Siebert, Well No. 1
Location:	535' FNL & 535' FEL -A-, Sec. 15, T23S, R28E Eddy County, N.M.
Type:	Oil Producer
Construction:	8-5/8" @ 510' w/ 350 sx 5-1/2" @ 6219' w/2050 sx
Date Drilled:	5-20-90
Record of Completion:	Perfs: 6059 - 6131' IPF: 295 BO Comp: 6-16-90

Well:	Oryx Energy Pardue Farms, Well No. 1
Location:	780' FSL & 660' FEL -P-, Sec. 10, T23S, R28E Eddy County, N.M.
Type:	Oil Producer
Construction:	8-5/8" @ 503' w/ 400 sx 5-1/2" @ 6200' w/1795 sx
Date Drilled:	7-25-90
Record of Completion:	Perfs: 6052 - 6128' IPF: 205 BO Comp: 8-19-90

VII. Proposed Operation

1. The average injection rate is estimated at 500 BWPD.

   The proposed maximum injection rate is 1000 BWPD.

2. The system will be open. If the wells' disposal capacity is such to handle additional water, other operators' wells in the area may be trucked into the storage tanks. Storage tanks will be located on the well site along with a powered salt water disposal pump. A salt water gathering system will transport from BTA tank batteries.

3. The proposed average injection pressure is 1000 psi.

   The proposed maximum injection pressure is 1250 psi.

4. The sources of injected water will be from the Delaware. At the present time, BTA's six producing wells in the area are producing water at a rate of 165 barrels per day. We are attaching five water analyses of produced water from BTA wells. See Exhibits A-1 through 5. We are attaching a compatibility study between the Delaware and the receiving formation, Cherry Canyon. See Exhibit B.

5. Our proposed injection zone is not productive of oil or gas within one mile of our proposed well.

VIII.

Geological Name:	Cherry Canyon
Lithological Detail:	Fine grained quartz sandstone and siltstone of the Cherry Canyon formation of the Delaware Mountain Group.
Thickness:	1120' in the Pardue C #1
Depth:	3558 - 3875'
Geological Data of Drinking Water Zone:	The underground source of drinking water overlying the zone of disposal is the Ogallala, which occurs from 50 to 250 feet and is approximately 200' thick.

IX. Proposed Stimulation Program

Perforate Zone 3500-3875'
Acidize Zone w/3500 gal 15% HCl

If required, fracture treat zone with amount to be determined later.

X. Logs were previously filed by BTA upon completion 5/24/90. A log section of proposed interval is enclosed.

XI. Analysis of fresh water wells attached:

BTA has obtained seven water samples; six from fresh water wells, all within one mile to one and one-fourth mile of our proposed disposal, and a sample of Pecos River water. See attached Exhibits C 1 & 2, with a map spotting the sample sources.

It should be noted that people living in the area have a municipal water source from "Malaga Water Users" with wells located fifteen miles away. The wells in this area are used for irrigation and livestock.

XII. After examining all available geological and engineering data, we find no evidence of open faults or any other hydrologic connection between the Delaware Mountain Group and any underground source of drinking water.

XIII. A copy of our application has been furnished by certified mail to the surface owner and to each leasehold operator within one-half mile of our proposed injection well. See listing on Exhibit -D-.

EXHIBIT A-1

CHEMLINK

WATER ANALYSIS REPORT

Lab ID No. : 121290D Analysis Date: December 10, 1990

Company : **BTA Oil Producers**
Field : Loving, East
Lease/Unit : **Pardue "C" #2**
Well ID. : **Water Tank**
Sample Loc.: SW/SW, Sec 11, T23S,R38E Eddy County, New Mexico

Sampled By : **Pro-Kem, Inc.**
Sample Date: *
Salesperson: **Gerald Phillips**
Formation : Delaware
Location : **Loving , N. M.**

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
Calcium as Ca++	29,062	1,453	Hydroxyl as OH-	0	0
Magnesium as Mg++	3,309	271	Carbonate as CO3=	0	0
Sodium as Na+ (Calc)	77,276	3,360	Bicarbonate as HCO3-	68	1
Barium as Ba++	Not Determined		Sulfate as SO4=	340	7
Oil Content	0		Chloride as Cl-	179,959	5,076

Total Dissolved Solids, Calculated: 290,016 mg/L.

Calculated Resistivity: 0.010 ohm-meters
mg/L. Hydrogen Sulfide: 40
mg/L. Carbon Dioxide: 300
mg/L. Dissolved Oxygen: Not Determined

pH: 6.200
Specific Gravity 60/60 F.: 1.199
Saturation Index @ 80 F.: +2.405
@ 140 F.: +3.105

Total Hardness: 86,093 mg/L. as CaCO3
Total Iron: 100.00 mg/L. as Fe++

Calcium Sulfate Scaling Potential
Not Present

Estimated Temperature of Calcium Carbonate Instability is 49 F.

Analyst 07:05 PM

PROBABLE MINERAL COMPOSITION

COMPOUND	MG/L	MEQ/L
Ca(HCO3)2	91	1.1
CaSO4	482	7.1
CaCl2	80,191	1,444.9
Mg(HCO3)2	0	0.0
MgSO4	0	0.0
MgCl2	12,918	271.3
NaHCO3	0	0.0
Na2SO4	0	0.0
NaCl	196,416	3,359.8

EXHIBIT A-2

CHEMLINK

WATER ANALYSIS REPORT

Lab ID No. : 121290B Analysis Date: December 10, 1990

Company	: **BTA Oil Producers**	**Sampled By**	: **Pro-Kem, Inc.**
Field	: Loving, East	**Sample Date:**	*
Lease/Unit	: **Pardue "B"**	**Salesperson:**	**Gerald Phillips**
Well ID.	: **No. 1**	**Formation**	: Delaware
Sample Loc.:	NE/SW, Sec 11, T23S, R28E Eddy County, New Mexico	**Location**	: **Loving , N. M.**

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
Calcium as Ca++	30,622	1,531	Hydroxyl as OH-	0	0
Magnesium as Mg++	3,191	262	Carbonate as CO3=	0	0
Sodium as Na+ (Calc)	76,307	3,318	Bicarbonate as HCO3-	73	1
Barium as Ba++	Below 5		Sulfate as SO4=	240	5
Oil Content	0		Chloride as Cl-	180,959	5,104

Total Dissolved Solids, Calculated: 291,393 mg/L.

Calculated Resistivity: 0.010 ohm-meters
mg/L. Hydrogen Sulfide: 40
mg/L. Carbon Dioxide: 200
mg/L. Dissolved Oxygen: Not Determined

pH: 6.500
Specific Gravity 60/60 F.: 1.205
Saturation Index @ 80 F.: +2.355
@ 140 F.: +3.455

Total Hardness: 89,498 mg/L. as CaCO3
Total Iron: 100.00 mg/L. as Fe++

Calcium Sulfate Scaling Potential Not Present

Estimated Temperature of Calcium Carbonate Instability is 51 F.

PROBABLE MINERAL COMPOSITION

COMPOUND	MG/L	MEQ/L
Ca(HCO3)2	97	1.2
CaSO4	340	5.0
CaCl2	84,633	1,524.9
Mg(HCO3)2	0	0.0
MgSO4	0	0.0
MgCl2	12,456	261.6
NaHCO3	0	0.0
Na2SO4	0	0.0
NaCl	193,953	3,317.7

Analyst 07:04 PM

EXHIBIT A-3

CHEMLINK

WATER ANALYSIS REPORT

Lab ID No. : 121290C Analysis Date: December 10, 1990

Company : **BTA Oil Producers**
Field : Loving, East
Lease/Unit : **Pardue "B"**
Well ID. : **No. 2**
Sample Loc.: NW/SW, Sec 11, T23S, R28E Eddy County, New Mexico

Sampled By : **Pro-Kem, Inc.**
Sample Date: *
Salesperson: **Gerald Phillips**
Formation : Delaware
Location : **Loving , N. M.**

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
Calcium as Ca++	28,477	1,424	Hydroxyl as OH-	0	0
Magnesium as Mg++	4,314	354	Carbonate as CO3=	0	0
Sodium as Na+ (Calc)	77,963	3,390	Bicarbonate as HCO3-	68	1
Barium as Ba++	Below 5		Sulfate as SO4=	260	5
Oil Content	0		Chloride as Cl-	182,959	5,161

Total Dissolved Solids, Calculated: 294,041 mg/L.

Calculated Resistivity: 0.010 ohm-meters
mg/L. Hydrogen Sulfide: 40
mg/L. Carbon Dioxide: 250
mg/L. Dissolved Oxygen: Not Determined

pH: 6.400
Specific Gravity 60/60 F.: 1.208
Saturation Index @ 80 F.: +2.856
@ 140 F.: +3.296

Total Hardness: 88,768 mg/L. as CaCO3
Total Iron: 10.00 mg/L. as Fe++

Calcium Sulfate Scaling Potential Not Present

Estimated Temperature of Calcium Carbonate Instability is 47 F.

PROBABLE MINERAL COMPOSITION

COMPOUND	MG/L	MEQ/L
Ca(HCO3)2	91	1.1
CaSO4	369	5.4
CaCl2	78,660	1,417.3
Mg(HCO3)2	0	0.0
MgSO4	0	0.0
MgCl2	16,839	353.6
NaHCO3	0	0.0
Na2SO4	0	0.0
NaCl	198,161	3,389.7

Analyst 07:04 PM

EXHIBIT A-4

CHEMLINK

WATER ANALYSIS REPORT

Lab ID No. : 121290E Analysis Date: December 10, 1990

Company : **BTA Oil Producers**
Field : Loving, East
Lease/Unit : **Pardue "D"**
Well ID. : **No. 1**
Sample Loc.: SW/NW, Sec 11, T23S, R28E Eddy County, New Mexico

Sampled By : **Pro-Kem, Inc.**
Sample Date: *
Salesperson: **Gerald Phillips**
Formation : Delaware
Location : **Loving , N. M.**

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
Calcium as Ca++	29,452	1,473	Hydroxyl as OH-	0	0
Magnesium as Mg++	3,309	271	Carbonate as CO3=	0	0
Sodium as Na+ (Calc)	76,797	3,339	Bicarbonate as HCO3-	64	1
Barium as Ba++	Below 5		Sulfate as SO4=	280	6
Oil Content	0		Chloride as Cl-	179,959	5,076

Total Dissolved Solids, Calculated: 289,862 mg/L.

Calculated Resistivity: 0.010 ohm-meters
mg/L. Hydrogen Sulfide: 40
mg/L. Carbon Dioxide: 250
mg/L. Dissolved Oxygen: Not Determined

pH: 6.300
Specific Gravity 60/60 F.: 1.200
Saturation Index @ 80 F.: +2.481
@ 140 F.: +3.181

Total Hardness: 87,066 mg/L. as CaCO3
Total Iron: 50.00 mg/L. as Fe++

Calcium Sulfate Scaling Potential
Not Present

Estimated Temperature of Calcium Carbonate Instability is 49 F.

Analyst 07:05 PM

PROBABLE MINERAL COMPOSITION

COMPOUND	MG/L	MEQ/L
Ca(HCO3)2	85	1.0
CaSO4	397	5.8
CaCl2	81,347	1,465.7
Mg(HCO3)2	0	0.0
MgSO4	0	0.0
MgCl2	12,918	271.3
NaHCO3	0	0.0
Na2SO4	0	0.0
NaCl	195,199	3,339.0

EXHIBIT A-5

CHEMLINK

WATER ANALYSIS REPORT

Lab ID No. : 110990c **Analysis Date: November 12, 1990**

Company : BTA Oil Producers
Field : Loving, East
Lease/Unit :
Well ID. : Pardue "D" #2
Sample Loc.: NW/NW, Sec 11, T23S, R28E
Eddy County, New Mexico

Sampled By : Pro-Kem, Inc.
Sample Date: * 10-23-90
Salesperson: Gerald Phillips
Formation : Delaware
Location : Loving , NM.

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
Calcium as Ca++	24,966	1,248	Hydroxyl as OH-	0	0
Magnesium as Mg++	4,137	339	Carbonate as CO3=	0	0
Sodium as Na+ (Calc)	76,514	3,327	Bicarbonate as HCO3-	64	1
Barium as Ba++	6	0	Sulfate as SO4=	300	6
Oil Content	0		Chloride as Cl-	173,961	4,907

Total Dissolved Solids, Calculated: 279,948 mg/L.

Calculated Resistivity: 0.010 ohm-meters
mg/L. Hydrogen Sulfide: 40
mg/L. Carbon Dioxide: 250
mg/L. Dissolved Oxygen: Not Determined

pH: 6.600
Specific Gravity 60/60 F.: 1.183
Saturation Index @ 80 F.: +1.779
@ 140 F.: +3.409

Total Hardness: 79,283 mg/L. as CaCO3
Total Iron: 56.00 mg/L. as Fe++

Calcium Sulfate Scaling Potential
Not Present

Estimated Temperature of Calcium Carbonate Instability is 55 F.

PROBABLE MINERAL COMPOSITION

COMPOUND	MG/L	MEQ/L
Ca(HCO3)2	85	1.0
CaSO4	425	6.3
CaCl2	68,875	1,241.0
Mg(HCO3)2	0	0.0
MgSO4	0	0.0
MgCl2	16,147	339.1
NaHCO3	0	0.0
Na2SO4	0	0.0
NaCl	194,480	3,326.7

Analyst 04:13 PM

EXHIBIT B

Martin Water Laboratories, Inc.
WATER CONSULTANTS SINCE 1953
BACTERIAL AND CHEMICAL ANALYSES

P.O. BOX 1468
MONAHANS, TEXAS 79756
PH. 943-3234 or 563-1040

709 W. INDIANA
MIDLAND, TEXAS 79701
PHONE 683-4521

February 21, 1991

Ms. Dorothy Houghton
BTA Oil Producers
104 South Pecos
Midland, TX 79701

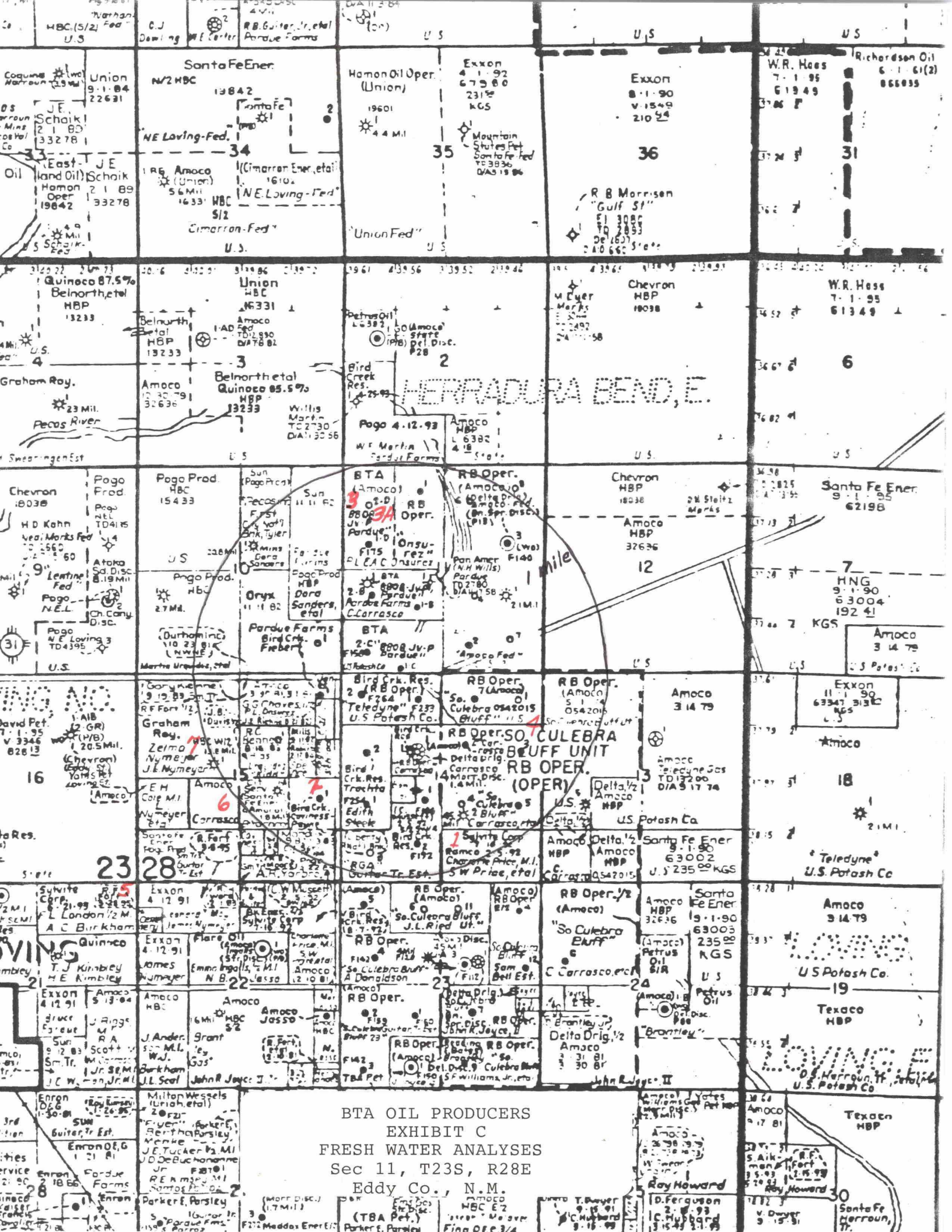
Dear Ms. Houghton:

This letter is in response to your request for an evaluation of the compatibility between the water from Pardue "B" #1 reported on laboratory #390176 (3-23-90) and our records of Cherry Canyon. It should be clarified that we have no records specifically designated as Cherry Canyon in this field but do have records in the Sand Dunes field some 15 miles to the east. We cannot be completely confident, but we would expect similar characteristics in the Cherry Canyon in this field. On the basis of the above qualifications of our Cherry Canyon records, we have found no evidence that any incompatibility would be expected between Cherry Canyon and Delaware from Pardue "B" #1.

Very truly yours,

Waylan C. Martin

WCM/rr



BTA OIL PRODUCERS
EXHIBIT C
FRESH WATER ANALYSES
Sec 11, T23S, R28E
Eddy Co., N.M.

EXHIBIT C-1

P O BOX 1468
MONAHANS TEXAS 79756
PH 943-3234 OR 563-1040

Martin Water Laboratories, Inc.

709 W INDIANA
MIDLAND TEXAS 79701
PHONE 683-4521

RESULT OF WATER ANALYSES

LABORATORY NO. 291173
SAMPLE RECEIVED 2-20-91
RESULTS REPORTED 2-21-91

TO: Dorothy Houghton
104 South Pecos, Midland, TX 79701

COMPANY BTA Oil Producers LEASE
FIELD OR POOL Loving, East (Delaware)
SECTION BLOCK SURVEY COUNTY Eddy STATE NM

SOURCE OF SAMPLE AND DATE TAKEN:

NO. 1 Sample #1 - windmill.
NO. 2 Sample #2 - Joe Trachta's house water well.
NO. 3 Sample #3 - irrigation well N. of Tony Onsurez' house. 2-16-91
NO. 4 Sample #3-A - irrigation well N. of Tony Onsurez' house. 2-20-91

REMARKS:

CHEMICAL AND PHYSICAL PROPERTIES	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.0111	1.0023	1.0102	1.0070
pH When Sampled				
pH When Received	7.23	7.65	6.61	6.43
Bicarbonate as HCO_3	327	166	22	137
Supersaturation as $CaCO_3$				
Undersaturation as $CaCO_3$				
Total Hardness as $CaCO_3$	3,900	945	3,925	3,275
Calcium as Ca	870	242	890	830
Magnesium as Mg	419	83	413	292
Sodium and/or Potassium	2,435	287	2,058	1,398
Sulfate as SO_4	3,093	560	2,667	2,400
Chloride as Cl	4,048	604	3,977	2,628
Iron as Fe	3.2	1.5	78.8	90.4
Barium as Ba				
Turbidity, Electric				
Color as Pt				
Total Solids, Calculated	11,192	1,942	10,027	7,684
Temperature °F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen,				
Hydrogen Sulfide	0.0	0.0	0.0	0.0
Resistivity, ohms/m at 77° F.	0.580	3.22	0.630	0.840
Suspended Oil				
Filtrable Solids as mg/l				
Volume Filtered, ml				

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks	Legal Description
Sample #1	SE/SW, Sec 14, T-23S, R-28E
Sample #2	NE/SE, Sec 15, T-23S, R-28E
Sample #3	NW/NW, Sec 11, T-23S, R-38E
Sample #3-A	NW/NW, Sec 11, T-23S, R-38E

Form No. 3

By

EXHIBIT C-2

P. O. BOX 1468
MONAHANS, TEXAS 79756
PH 943-3234 OR 563-1040

Martin Water Laboratories, Inc.

709 W. INDIANA
MIDLAND, TEXAS 79701
PHONE 683-4521

RESULT OF WATER ANALYSES

LABORATORY NO. 291173 (Page 2)
SAMPLE RECEIVED 2-20-91
RESULTS REPORTED 2-21-91

TO: Dorothy Houghton
104 South Pecos, Midland, TX 79701

COMPANY BTA Oil Producers LEASE
FIELD OR POOL Loving, East (Delaware)
SECTION BLOCK SURVEY COUNTY Eddy STATE NM
SOURCE OF SAMPLE AND DATE TAKEN:
NO. 1 Sample #4 - Pecos River.
NO. 2 Sample #5 - windmill @ Frank London's house.
NO. 3 Sample #6 - irrigation well @ Lionel Onsurez' leased farm.
NO. 4 Sample #7 - irrigation well on Lawrence Nymeyer's fee surface.
REMARKS: 4. Surface leased & farmed by Reed Kimbley.

CHEMICAL AND PHYSICAL PROPERTIES	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.0050	1.0063	1.0052	1.0062
pH When Sampled				
pH When Received	6.78	6.79	6.69	6.83
Bicarbonate as HCO_3	134	234	327	293
Supersaturation as $CaCO_3$				
Undersaturation as $CaCO_3$				
Total Hardness as $CaCO_3$	1,700	2,650	2,880	3,100
Calcium as Ca	412	768	740	792
Magnesium as Mg	163	177	250	272
Sodium and/or Potassium	554	835	971	905
Sulfate as SO_4	1,387	1,893	2,133	2,187
Chloride as Cl	959	1,633	1,775	1,811
Iron as Fe	0.56	4.1	1.6	0.40
Barium as Ba				
Turbidity, Electric				
Color as Pt				
Total Solids Calculated	3,608	5,541	6,197	6,260
Temperature °F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen,				
Hydrogen Sulfide	0.0	0.0	0.0	0.0
Resistivity, ohms/m at 77° F.	1.79	1.19	1.08	1.06
Suspended Oil				
Filtrable Solids as mg/l				
Volume Filtered, ml				

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks	Legal Description
Sample #4	SE/NE, Sec 21, T-23S, R-28E
Sample #5	NE/NE, Sec 21, T-35S, R-28E
Sample #6	NE/SW, Sec 15, T-23S, R-28E
Sample #7	SE/NE, Sec 15, T-23S, R-28E

The undersigned certifies the above to be true and correct to the best of his knowledge and belief.

Form No. 3

By
Waylan C. Martin, M.A.

EXHIBIT -D-

BTA Oil Producers

Pardue -C-, 8808 JV-P
Well No. 1 - Proposed SWD
Sec. 11, T-23-S, R-28-E
Eddy County, New Mexico

Surface Owner:

Mississippi Chemical Corp.
P. O. Box 101
Carlsbad, NM 88220

Offset leasehold Operators within one-half mile of well location:

Bird Creek Resources 1412 S. Boston, Suite 550 Tulsa, Oklahoma 74119	NW4, Sec. 14 NE4, Sec. 15
Oryx Energy Company P. O. Box 2880 Dallas, Texas 75221	SE4, SE4, Sec. 10
Pogo Producing Company P. O. Box 10340 Midland, Texas 79702-7340	NE4, SE4, Sec. 10
RB Operating Company Two Warren Place 6120 South Yale, Suite 1700 Tulsa, Oklahoma 74136	SE4, Sec. 11 NE4, Sec. 14

I hereby certify the above were mailed copies of our application on February 21, 1991, by certified mail.

Dorothy Houghton