Amoco Production Company

501 WestLake Park Boulevard
Post Office Box 3092
Houston, Texas 77253

October 23, 1991

State of New Mexico
Energy & Minerals Department
310 Old Santa Fe Trail
Santa Fe, New Mexico 87504

Rec'd 10/30/91

Attention: David Catanach

File: KWB-809-WF

Application for Authority to Inject
South Hobbs (GSA) Unit
Hobbs Grayburg-San Andres Pool
Lea County, New Mexico

Amoco Production Company, as operator of the South Hobbs (Grayburg-San Andres) Unit, Lea County, New Mexico, hereby applies for administrative approval to add five South Hobbs (GSA) Unit water injection wells to our secondary recovery project. Please find enclosed Form C-108 and the necessary documentation.

As required, a copy of this application complete with all attachments has been served by certified mail to each of the parties shown on the attached service list.

If you should have any questions concerning this application, please contact Kim Colvin at 713/596-7686.

Yours very truly,

K. W. Brand
HB

K. W. Brand
Administrative Services Manager

KAC:avd

Attachments

cc: State of New Mexico
Oil Conservation Division
P. O. Box 1980
Hobbs, NM 88240

Service List
South Hobbs (GSA) Unit
Injection Wells
South Hobbs Unit Nos. 229, 230, 233, 235, & 238

Surface Owners

State of New Mexico
Commissioner of Public Lands
P. O. Box 1148
Santa Fe, NM 87504

Offset Owners

Shell Western E&P, Inc.
P. O. Box 576
Houston, TX 77001

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

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

FORM C-108
Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: [X] Secondary Recovery [ ] Pressure Maintenance [ ] Disposal [ ] Storage
Application qualifies for administrative approval? [ ] yes [ ] no

II. Operator: Amoco Production Company

Address: P. O. Box 3092, Houston, TX 77253 Rm. 17.182

Contact party: Billy Abbott Phone: 505/397-8219

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? [XX] yes [ ] no
If yes, give the Division order number authorizing the project R-4934.

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: Kim A. Colvin Title Asst. Admin. Analyst

Signature: Kim A. Colvin Date: 10/24/91

* 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

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.

III. Well Data

A. (1) South Hobbs (GSA) Unit #229: 1088' FNL X 1977' FWL of Sec. 4, T-19-S, R-38-E, NMPM, Lea County, NM

South Hobbs (GSA) Unit #230: 1100' FNL X 2220' FEL of Sec. 4, T-19-S, R-38-E, NMPM, Lea County, NM

South Hobbs (GSA) Unit #233: 2245' FNL X 2420' FEL of Sec. 4, T-19-S, R-38-E, NMPM, Lea County, NM

South Hobbs (GSA) Unit #235: 2160' FSL X 2414' FWL of Sec. 4, T-19-S, R-38-E, NMPM, Lea County, NM

South Hobbs (GSA) Unit #238: 660' FSL X 2610' FEL of Sec. 4, T-19-S, R-38-E, NMPM, Lea County, NM

(2) Proposed Casing and Cementing Program

Size of Hole	Size of Casing	Setting Depth	Sacks of Cement	Top of Cement
12-1/4"	8-5/8"	1600'	1100 sx	Surface (Circ.)
7-7/8"	5-1/2"	4350'	1300 sx	Surface (Circ.)

(3) Tubing size 2-3/8" lined with plastic coating and set at 4000'.

(4) Guiberson 5-1/2 Uni VI packer set at 4000'.

(B)(1) Injection Formation: Grayburg San Andres.
Pool: Hobbs Grayburg San Andres.

(2) Injection interval 4100' - 4250' will be perforated.

(3) Wells will be drilled for injection.

(4) Not applicable.

(5) Next Higher Zone: Bowers
Next Lower Zone: Paddock

V. Please refer to attached maps.

VI.

The data within Item VI has already been submitted. Please reference approved orders:

Order No.	Date
R-4934	12/03/74
R-4934-A	8/04/83
R-4934-C	9/30/83
PMX-81	4/15/80
PMX-130	10/17/84
PMX-132	10/31/84
PMX-134	2/05/85
PMX-142	9/03/86

VII.

1. Average daily injection rate: 2,000 BWIPD/well
   Maximum daily injection rate: 3,500 BWIPD/well

2. The system is CLOSED.

3. Average injection pressure: 450 psi surface pressure
   Maximum injection pressure: 800 psi surface pressure

4. Please refer to attached water analysis report.

5. Not applicable

VIII. Previously submitted by earlier referenced orders.

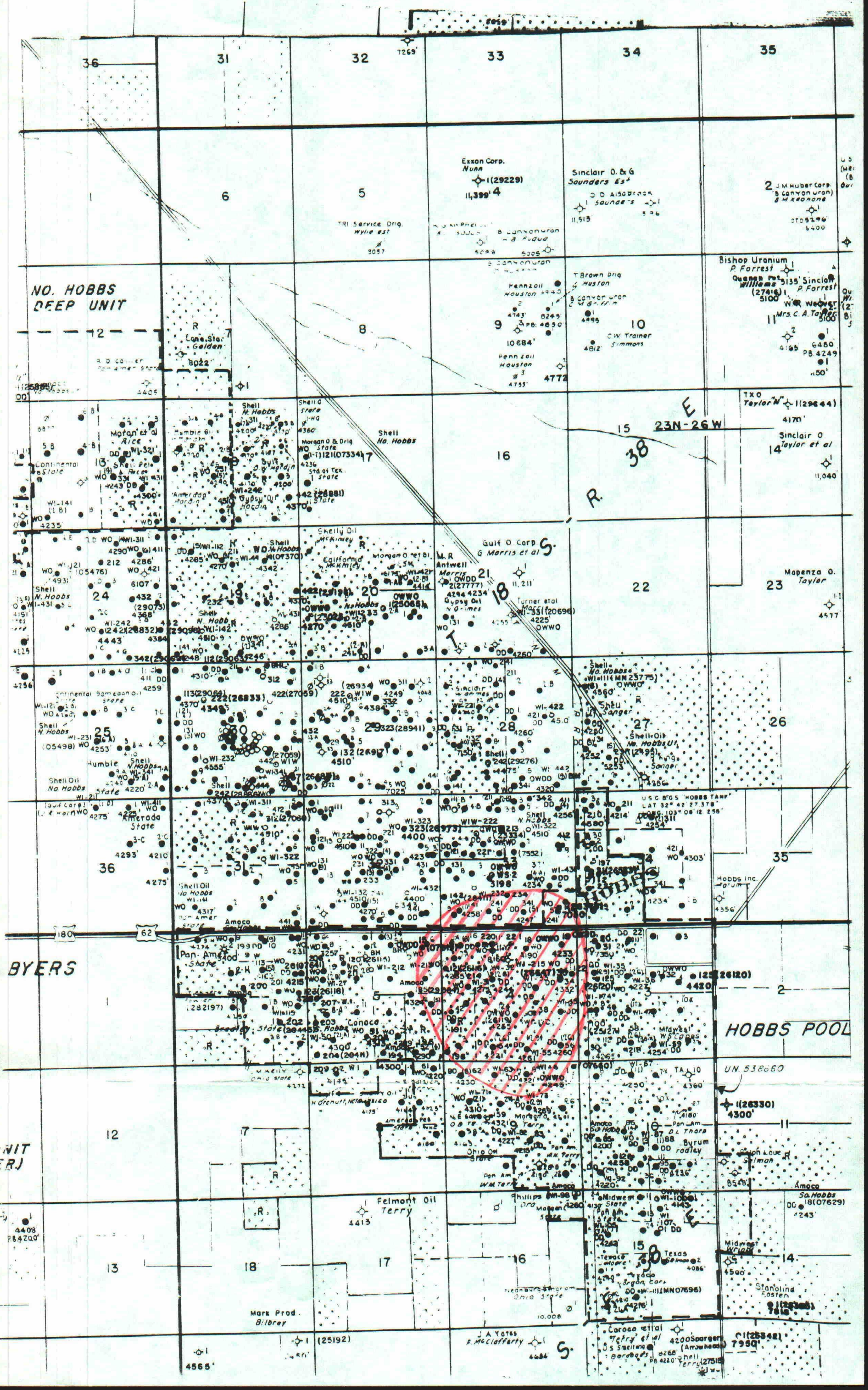
IX. Stimulation program consists of acidizing with 15% HC1 NEFE using 50-75 gals/foot of perfs (total 5,000-6,000 gallons acid per well).

X. Previously submitted by earlier referenced orders.

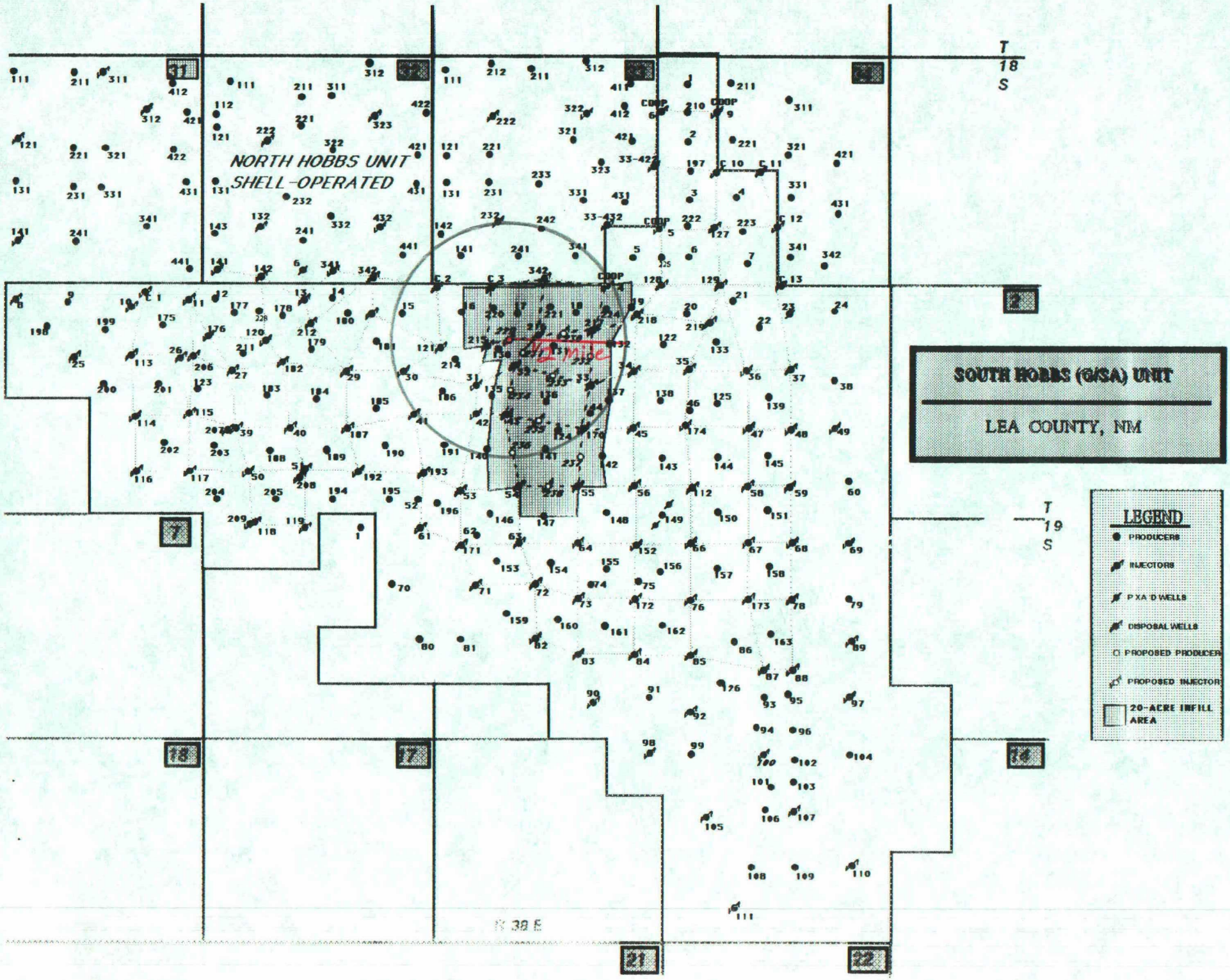
XI. Previously submitted by earlier referenced orders (PMX-142).

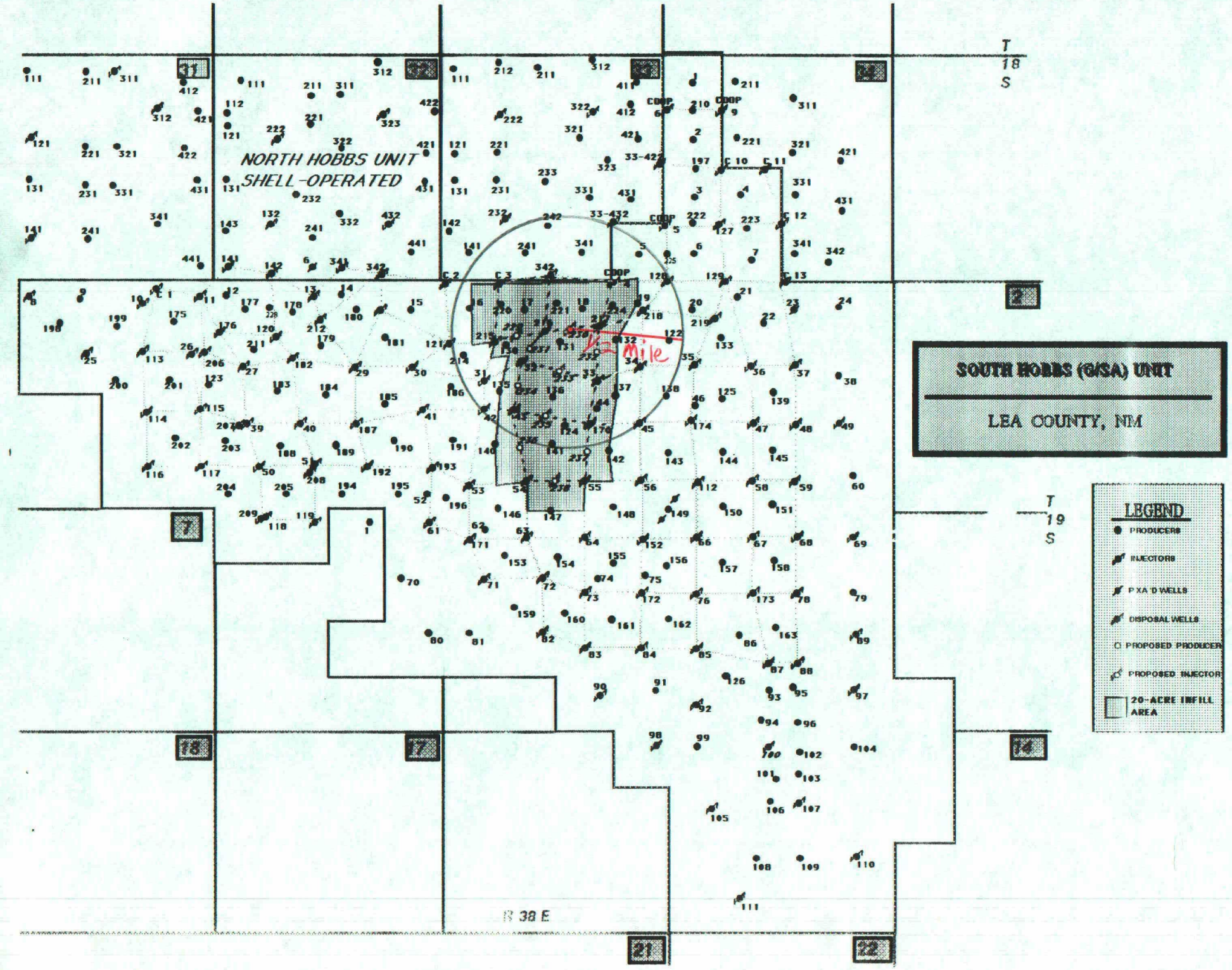
XII. Not applicable.

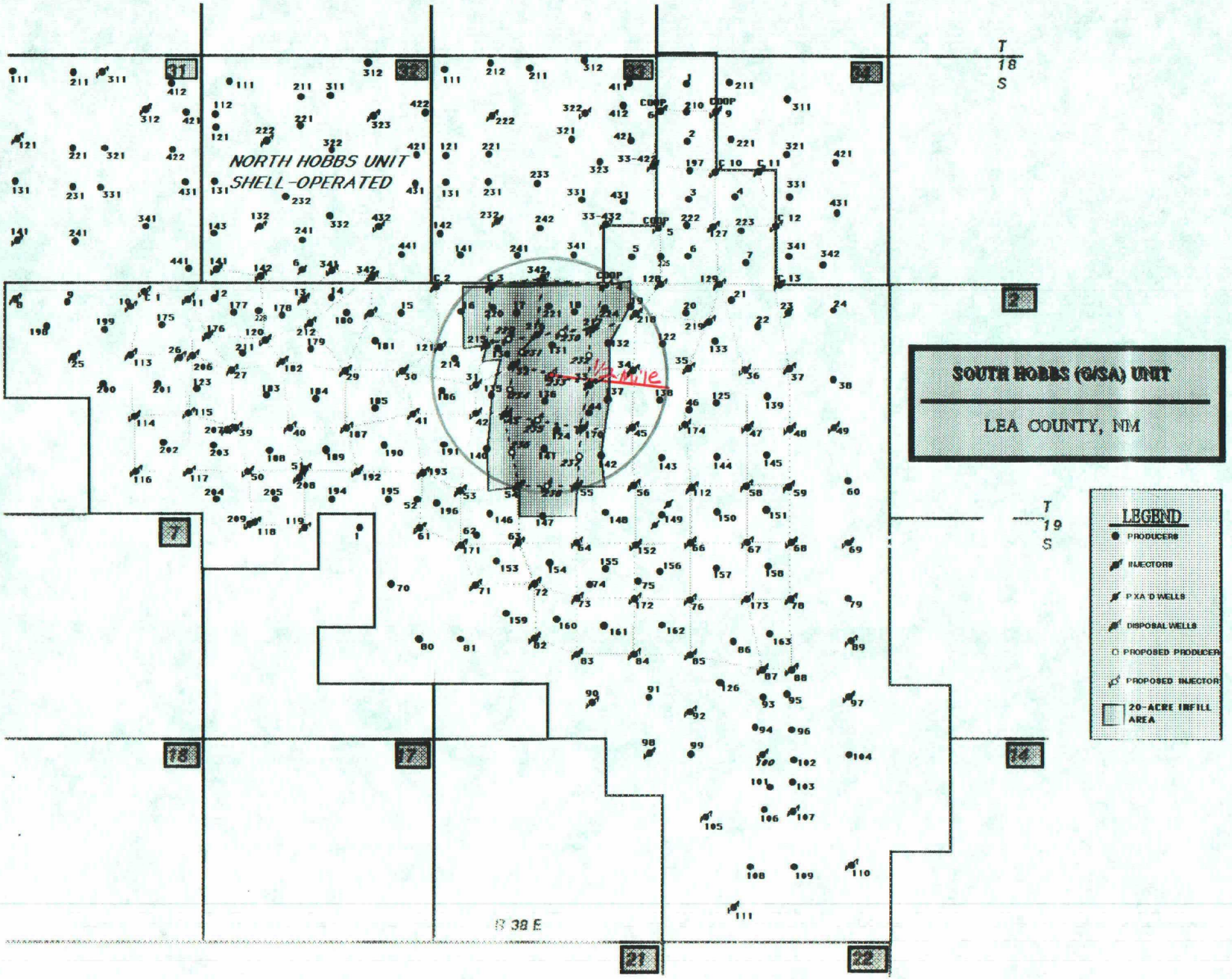
XIII. Copy of this application and attachments have been mailed, as required by "Proof of Notice" section, to all parties on the attached service list.

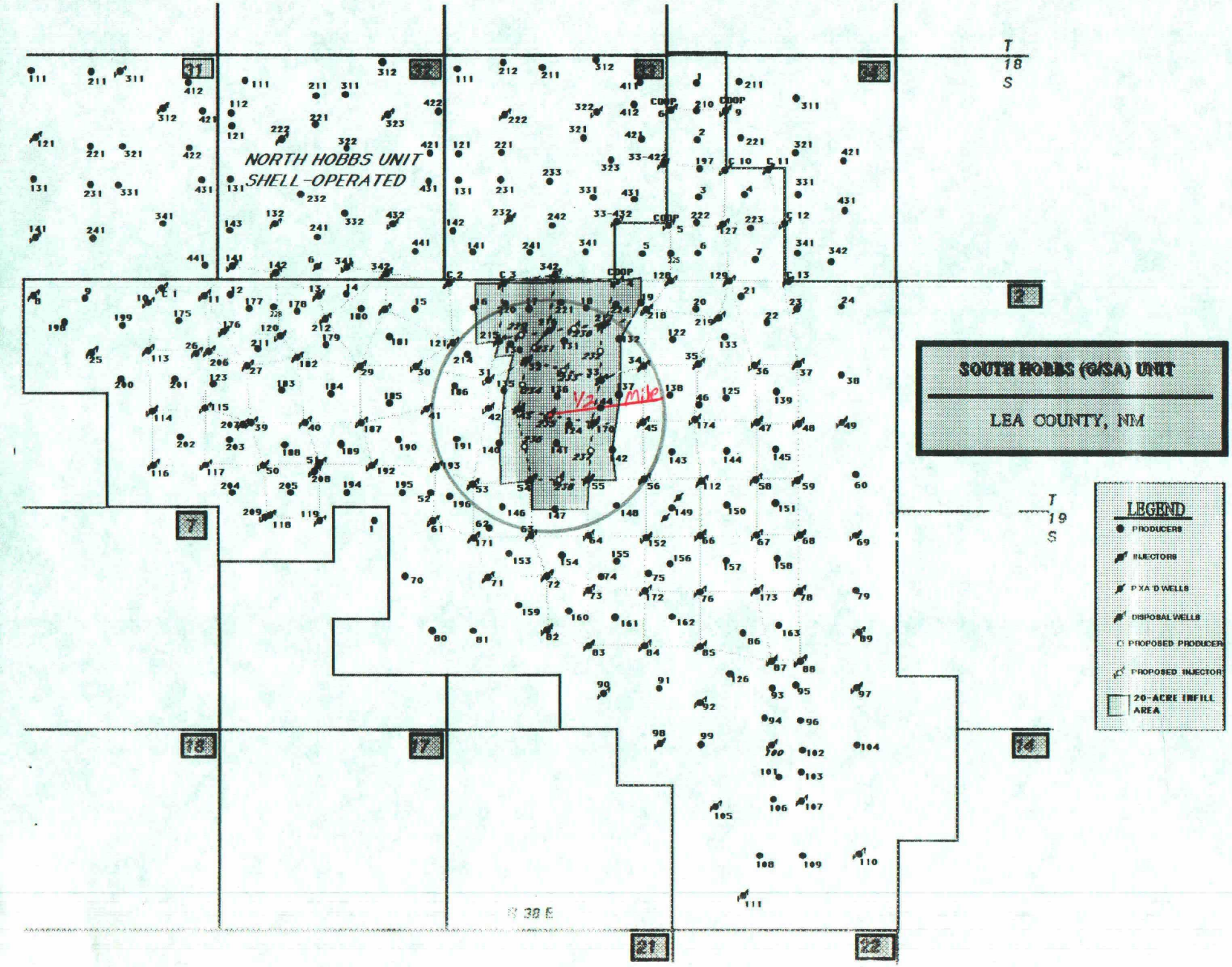


NO. HOBBS
DEEP UNIT
23N-26W
R. 38 E
T. 18 S.
BYERS
HOBBS POOL
UN. 538660
Exxon Corp.
Nunn
Sinclair O. & G
Saunders Est
Bishop Uranium
P. Forrest
Shell
No. Hobbs
Gulf O. Corp.
G Morris et al
Mapenza O.
Taylor
Continental
State
Shell
N. Hobbs
Humble
Amerada
State
Felmont Oil
Terry
Mark Prod.
Bilbrey
J. A. Yates
F. McClafferty
Stanolind
Fosten
Amoco
So. Hobbs
Midwest
Wright
Texas
Pan Am
Ohio Oil
State
Hobbs Inc.
Tatum
TXO
Taylor "N"
Sinclair O
Taylor et al
Pennzoil
Houston
C.W. Trainer
Simmons
Lone Star
Golden
Gypsy Oil
Hardin
Skelly Oil
McKinley
M.R. Antwell
Morris
Turner et al
Conoco
Pan-Am
State
Bradley State


NORTH HOBBS UNIT
SHELL-OPERATED
1/2 Mile
T 18 S
T 19 S
SOUTH HOBBS (G/SA) UNIT
LEA COUNTY, NM
LEGEND
PRODUCERS
INJECTORS
P X A 'D WELLS
DISPOSAL WELLS
PROPOSED PRODUCER
PROPOSED INJECTOR
20-ACRE INFILL AREA
R 38 E


NORTH HOBBS UNIT
SHELL-OPERATED
½ Mile
T 18 S
T 19 S
R 38 E
SOUTH HOBBS (G/SA) UNIT
LEA COUNTY, NM
LEGEND
PRODUCERS
INJECTORS
P X A 'D WELLS
DISPOSAL WELLS
PROPOSED PRODUCER
PROPOSED INJECTOR
20-ACRE INFILL AREA


NORTH HOBBS UNIT
SHELL-OPERATED
½ Mile
SOUTH HOBBS (G/SA) UNIT
LEA COUNTY, NM
LEGEND
PRODUCERS
INJECTORS
P X A 'D WELLS
DISPOSAL WELLS
PROPOSED PRODUCER
PROPOSED INJECTOR
20-ACRE INFILL AREA
T 18 S
T 19 S
R 38 E


NORTH HOBBS UNIT
SHELL-OPERATED
SOUTH HOBBS (G/SA) UNIT
LEA COUNTY, NM
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T 19 S
1/2 Mile
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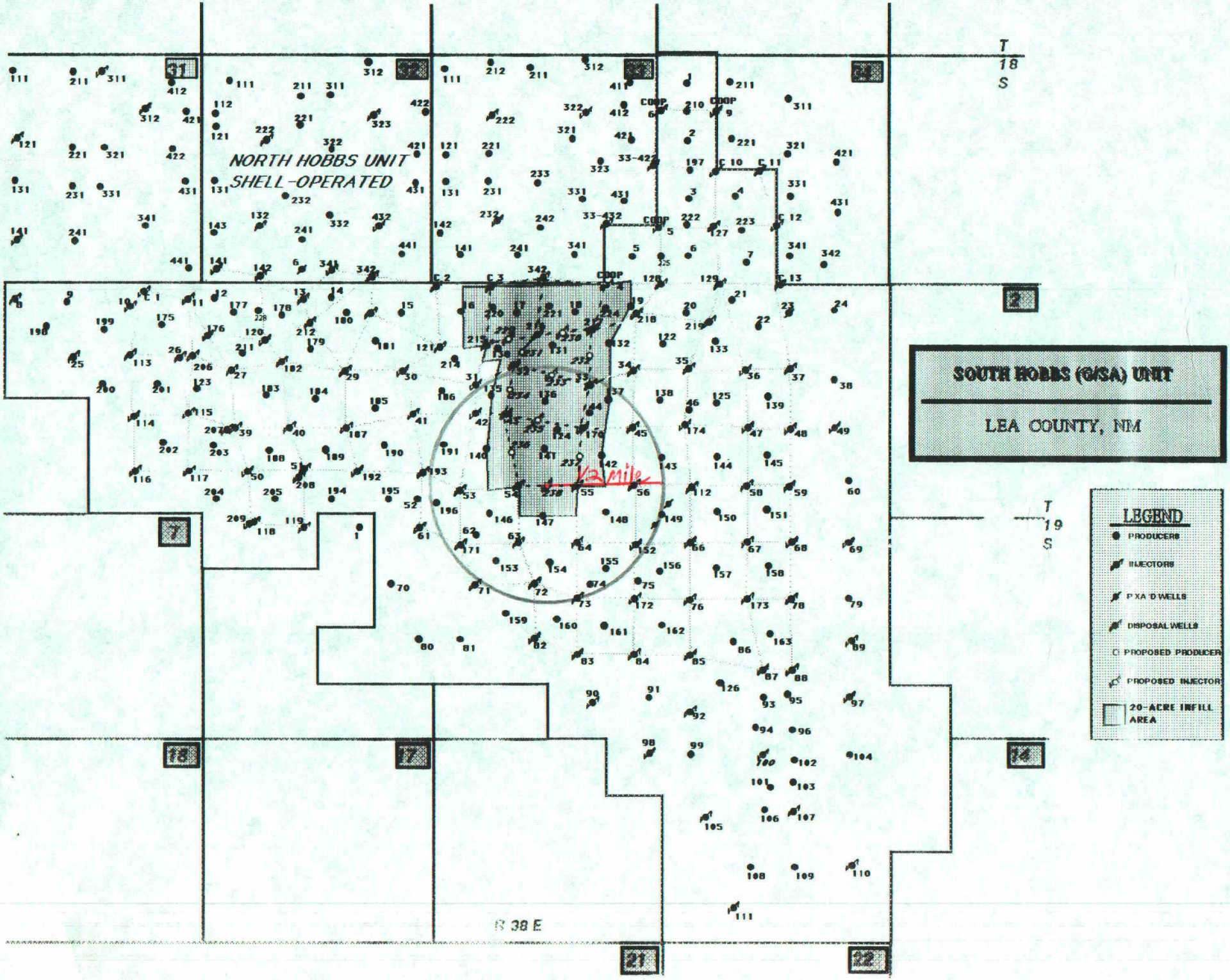
PRODUCERS
INJECTORS
P X A 'D WELLS
DISPOSAL WELLS
PROPOSED PRODUCER
PROPOSED INJECTOR
20-ACRE INFILL AREA


NORTH HOBBS UNIT
SHELL-OPERATED
SOUTH HOBBS (G/SA) UNIT
LEA COUNTY, NM
T 18 S
T 19 S
R 38 E
1/2 Mile
LEGEND
PRODUCERS
INJECTORS
P X A 'D WELLS
DISPOSAL WELLS
PROPOSED PRODUCER
PROPOSED INJECTOR
20-ACRE INFILL AREA

WELCHEM, INC.
706 N. Main
P.O. Box 179
Seminole, Texas 79360-0179
915-758-5867

LATS NO. 35228

Produced Water

ANALYTICAL SERVICES REPORT
WATER ANALYSIS

Date Received: 10/29/90 By: LS Date Out: 11/16/90

Company: AMOCO PRODUCTION COMPANY
Salesman: WHITE
Lease: SOUTH HOBBS UNIT
Source: TANK

Date Sampled: 10/25/90
County: LEA
State: NM
Well: NORTH 5K

DISSOLVED SOLIDS

CATIONS

	mg/l	me/l
Sodium, Na(calc)	2366.0	102.9
Calcium, Ca	573	28.59
Magnesium, Mg	227	18.61
Potassium, K	204	5.22
Iron, Fe	0.45	0.02
Manganese, Mn	0.29	0.01

ANIONS

	mg/l	me/l
Chloride, Cl	4040	113.8
Sulfate, SO4	650	13.54
Carbonate, CO3	0	0.0
Bicarbonate,HCO3	1708	28.0

Total Dissolved Solids (calc.) 9,769 ppm

OTHER PROPERTIES

pH	6.89
Specific Gravity, 60/60 F	1.007
Nomograph Sp. Gr.	1.004- 1.013
Specific Gravity, Uncorr	1.005
Temperature (F)	70.3
Resistivity, OHMS-CM	100 @ 70.3F
H2S = 475	
O2 = 0	

SCALING TENDENCIES(MG/L):

				SCALE INDEX(MG/L)			
TEMP(F)	P(PSI)	CO2(PSI)	PH	CASO4	BASO4	SRSO4	CACO3
80	14.7	0.625	6.9	-2188	-0	-108	1013
110	14.7	0.625	6.9	-1496	-0	-113	1106
140	14.7	0.625	6.9	-1002	-0	-87	1178
170	14.7	0.625	6.9	-626	-0	-32	1236
200	14.7	0.625	6.9	-330	-0	-17	1279

Remarks & Recommendations:

Calculations based upon entered pH.

WELCHEM Representative Brent Hargett

WELCHEM, INC.
706 N. Main
P.O. Box 179
Seminole, Texas 79360-0179
915-758-5867

LATS NO. 35229

Produced Water

ANALYTICAL SERVICES REPORT
WATER ANALYSIS

Date Received: 10/29/90 By: LS Date Out: 11/16/90

Company: AMOCO PRODUCTION COMPANY
Salesman: WHITE
Lease: SOUTH HOBBS UNIT
Source: TANK

Date Sampled: 10/25/90
County: LEA
State: NM
Well: NORTH 10K

DISSOLVED SOLIDS CATIONS

	mg/l	me/l
Sodium, Na(calc)	2220.0	96.53
Calcium, Ca	578	28.84
Magnesium, Mg	219	17.95
Potassium, K	202	5.17
Iron, Fe	0.01	0.0
Manganese, Mn	0.26	0.01

OTHER PROPERTIES

pH	6.85
Specific Gravity, 60/60 F	1.007
Nomograph Sp. Gr.	1.004- 1.013
Specific Gravity, Uncorr	1.005
Temperature (F)	70.3
Resistivity, OHMS-CM	120 @ 70.3F
H2S = 350	
O2 = 0	

ANIONS

	mg/l	me/l
Chloride, Cl	4020	113.24
Sulfate, SO4	550	11.46
Carbonate, CO3	0	0.0
Bicarbonate,HCO3	1452	23.8

Total Dissolved Solids (calc.) 9,241 ppm

SCALING TENDENCIES(MG/L):

				SCALE INDEX(MG/L)			
TEMP(F)	P(PSI)	CO2(PSI)	PH	CASO4	BASO4	SRSO4	CACO3
80	14.7	0.625	6.9	-2023	-0	-120	798
110	14.7	0.625	6.9	-1403	-0	-125	893
140	14.7	0.625	6.9	-959	-0	-97	970
170	14.7	0.625	6.9	-620	-0	-37	1024
200	14.7	0.625	6.9	-356	-0	-19	1067

Remarks & Recommendations:

Calculations based upon entered pH.

WELCHEM Representative Brent Heigert

WELCHEM, INC.
706 N. Main
P.O. Box 179
Seminole, Texas 79360-0179
915-758-5867

LATS NO. 35230

Produced Water

ANALYTICAL SERVICES REPORT
WATER ANALYSIS

Date Received: 10/29/90 By: LS Date Out: 11/16/90

Company: AMOCO PRODUCTION COMPANY
Salesman: WHITE
Lease: SOUTH HOBBS UNIT
Source: TANK

Date Sampled: 10/25/90
County: LEA
State: NM
Well: SOUTH 5K

DISSOLVED SOLIDS CATIONS

	mg/l	me/l
Sodium, Na(calc)	2278.0	99.05
Calcium, Ca	687	34.28
Magnesium, Mg	235	19.26
Potassium, K	199	5.09
Iron, Fe	1.51	0.05
Manganese, Mn	0.29	0.01

OTHER PROPERTIES

pH	6.65
Specific Gravity, 60/60 F	1.008
Nomograph Sp. Gr.	1.005- 1.013
Specific Gravity, Uncorr	1.006
Temperature (F)	70.9
Resistivity, OHMS-CM	105 @ 70.9F
H2S = 400	
O2 = 0	

ANIONS

	mg/l	me/l
Chloride, Cl	4100	115.49
Sulfate, SO4	780	16.25
Carbonate, CO3	0	0.0
Bicarbonate,HCO3	1586	26.0

Total Dissolved Solids (calc.) 9,867 ppm

SCALING TENDENCIES(MG/L):

				SCALE INDEX(MG/L)			
TEMP(F)	P(PSI)	CO2(PSI)	PH	CASO4	BASO4	SRSO4	CACO3
80	14.7	1.250	6.7	-2017	-0	-93	801
110	14.7	1.250	6.7	-1323	-0	-97	922
140	14.7	1.250	6.7	-826	-0	-74	1020
170	14.7	1.250	6.7	-451	-0	-27	1089
200	14.7	1.250	6.7	-158	-0	-14	1144

Remarks & Recommendations:

Calculations based upon entered pH.

WELCHEM Representative Brent Heigert

WELCHEM, INC.
706 N. Main
P.O. Box 179
Seminole, Texas 79360-0179
915-758-5867

LATS NO. 35231

Produced Water

ANALYTICAL SERVICES REPORT
WATER ANALYSIS

Date Received: 10/29/90 By: LS Date Out: 11/16/90

Company: AMOCO PRODUCTION COMPANY
Salesman: WHITE
Lease: SOUTH HOBBS UNIT
Source: TANK

Date Sampled: 10/25/90
County: LEA
State: NM
Well: SOUTH 10K

DISSOLVED SOLIDS
CATIONS

	mg/l	me/l
Sodium, Na(calc)	2299.0	99.97
Calcium, Ca	693	34.58
Magnesium, Mg	239	19.59
Potassium, K	200	5.12
Iron, Fe	0.56	0.02
Manganese, Mn	0.29	0.01

OTHER PROPERTIES

pH	6.76
Specific Gravity, 60/60 F	1.008
Nomograph Sp. Gr.	1.005- 1.013
Specific Gravity, Uncorr	1.006
Temperature (F)	71.1
Resistivity, OHMS-CM	95 @ 71.1F
H2S = 400	
O2 = 0	

ANIONS

	mg/l	me/l
Chloride, Cl	4220	118.87
Sulfate, SO4	740	15.42
Carbonate, CO3	0	0.0
Bicarbonate,HCO3	1525	25.0

Total Dissolved Solids (calc.) 9,917 ppm

SCALING TENDENCIES(MG/L):

				SCALE INDEX(MG/L)			
TEMP(F)	P(PSI)	CO2(PSI)	PH	CASO4	BASO4	SRSO4	CACO3
80	14.7	1.250	6.7	-1986	-0	-98	750
110	14.7	1.250	6.7	-1314	-0	-102	872
140	14.7	1.250	6.7	-833	-0	-78	969
170	14.7	1.250	6.7	-469	-0	-29	1038
200	14.7	1.250	6.7	-183	-0	-15	1093

Remarks & Recommendations:

Calculations based upon entered pH.

WELCHEM Representative Brent Hegert

WELCHEM, INC.
706 N. Main
P.O. Box 179
Seminole, Texas 79360-0179
915-758-5867

LATS NO. 35232

Injection Water

ANALYTICAL SERVICES REPORT
WATER ANALYSIS

Date Received: 10/29/90 By: LS Date Out: 11/16/90

Company: AMOCO PRODUCTION COMPANY
Salesman: WHITE
Lease: SOUTH HOBBS UNIT
Source: PUMP

Date Sampled: 10/25/90
County: LEA
State: NM
Well: #2 TURBINE

DISSOLVED SOLIDS
CATIONS

	mg/l	me/l
Sodium, Na(calc)	2122.0	92.29
Calcium, Ca	597	29.79
Magnesium, Mg	217	17.79
Potassium, K	181	4.63
Iron, Fe	0.01	0.0
Manganese, Mn	0.26	0.01

OTHER PROPERTIES

pH	6.84
Specific Gravity, 60/60 F	1.007
Nomograph Sp. Gr.	1.004- 1.013
Specific Gravity, Uncorr	1.005
Temperature (F)	71.1
Resistivity, OHMS-CM	120 @ 71.1F
H2S = 60	
O2 = 0	

ANIONS

	mg/l	me/l
Chloride, Cl	3760	105.92
Sulfate, SO4	710	14.79
Carbonate, CO3	0	0.0
Bicarbonate,HCO3	1452	23.8

Total Dissolved Solids (calc.) 9,039 ppm

SCALING TENDENCIES(MG/L):

				SCALE INDEX(MG/L)			
TEMP(F)	P(PSI)	CO2(PSI)	PH	CASO4	BASO4	SRSO4	CACO3
80	14.7	0.625	6.9	-2121	-0	-97	799
110	14.7	0.625	6.9	-1421	-0	-100	893
140	14.7	0.625	6.9	-921	-0	-77	970
170	14.7	0.625	6.9	-542	-0	-29	1024
200	14.7	0.625	6.9	-246	-0	-15	1067

Remarks & Recommendations:

Calculations based upon entered pH.

WELCHEM Representative Brent Dugat

VELCHEM®
WELCHEM, INC.
706 N. Main
P.O. Box 179
Seminole, Texas 79360-0179
915-758-5867

LATS NO. 35233

City (makeup) Water

ANALYTICAL SERVICES REPORT
WATER ANALYSIS

Date Received: 10/29/90 By: LS Date Out: 11/16/90

ompany: AMOCO PRODUCTION COMPANY
lesman: WHITE
ase: SOUTH HOBBS UNIT
ource: CITY WATER

Date Sampled: 10/25/90
County: LEA
State: NM
Well:

SSOLVED SOLIDS
TIONS

	mg/l	me/l
odium, Na(calc)	339.0	14.74
alcium, Ca	125	6.24
agnesium, Mg	31	2.54
otassium, K	20	0.51
on, Fe	0.01	0.0
anganese, Mn	0.27	0.01

OTHER PROPERTIES

pH	7.20
Specific Gravity, 60/60 F	1.002
Nomograph Sp. Gr.	1.000- 1.006
Specific Gravity, Uncorr	1.000
Temperature (F)	71.1
Resistivity, OHMS-CM	580 @ 71.1F
H2S = 0	
O2 = 0.1	

NIONS

	mg/l	me/l
loride, Cl	460	12.96
lfate, SO4	100	2.08
arbonate, CO3	0	0.0
icarbonate, HCO3	549	9.0

otal Dissolved Solids (calc.) 1,624 ppm

CALING TENDENCIES (MG/L):

				SCALE INDEX (MG/L)			
EMP(F)	P(PSI)	CO2(PSI)	PH	CASO4	BASO4	SRSO4	CACO3
80	14.7	0.156	7.3	-1562	-0	-150	121
110	14.7	0.156	7.3	-1130	-0	-153	166
140	14.7	0.156	7.3	-827	-0	-113	203
170	14.7	0.156	7.3	-604	-0	-28	230
200	14.7	0.156	7.3	-435	-0	-12	251

emarks & Recommendations:

Calculations based upon entered pH.

WELCHEM Representative Brent Hargett

WELCHEM, INC.
706 N. Main
P.O. Box 179
Seminole, Texas 79360-0179
915-758-5867

LATS NO. 46468

Injection Water

ANALYTICAL SERVICES REPORT
WATER ANALYSIS

Date Received: 10/14/91 By: LS Date Out: 10/14/91

Company: AMOCO PRODUCTION COMPANY
Salesman: WHITE
Lease: SOUTH HOBBS UNIT
Source:

Date Sampled: 10/14/91
County: LEA
State: NM
Well: TURBINE #1

DISSOLVED SOLIDS
CATIONS

	mg/l	me/l
Sodium, Na(calc)	1945.0	84.59
Calcium, Ca	700	34.93
Magnesium, Mg	210	17.21
Potassium, K	200	5.12
Iron, Fe	1.0	0.04
Manganese, Mn	.1	0.0

OTHER PROPERTIES

pH	7.02
Specific Gravity, 60/60 F	1.005
Nomograph Sp. Gr.	1.004- 1.013
Specific Gravity, Uncorr	1.003
Temperature (F)	70.0
Resistivity, OHMS-CM	100 @ 70.0F

ANIONS

	mg/l	me/l
Chloride, Cl	4000	112.68
Sulfate, SO4	250	5.21
Carbonate, CO3	0	0.0
Bicarbonate, HCO3	1464	24.0

Total Dissolved Solids (calc.) 8,770 ppm

SCALING TENDENCIES (MG/L):

TEMP(F)	P(PSI)	CO2(PSI)	PH	SCALE INDEX(MG/L) CASO4	BASO4	SRSO4	CACO3
80	14.7	0.313	7.1	-1312	-0	-193	895
110	14.7	0.313	7.1	-957	-0	-204	969
140	14.7	0.313	7.1	-697	-0	-167	1025
170	14.7	0.313	7.1	-498	-0	-72	1070
200	14.7	0.313	7.1	-340	-1	-40	1104

Remarks & Recommendations:

Calculations based upon entered pH.

WELCHEM Representative

AFFIDAVIT OF PUBLICATION

State of New Mexico,
County of Lea.

I, Kathi Bearden

of the Hobbs Daily News-Sun, a daily newspaper published at Hobbs, New Mexico, do solemnly swear that the clipping attached hereto was published once a week in the regular and entire issue of said paper, and not a supplement thereof for a period

of

One weeks.

Beginning with the issue dated

Oct. 17, 1991

and ending with the issue dated

Oct. 17, 1991

Kathi Bearden
General Manager

Sworn and subscribed to before me this 24 day of Oct, 1991

Paula Parker
Notary Public.

My Commission expires

Aug. 5, 1995
(Seal)

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937, and payment of fees for said publication has been made.

LEGAL NOTICE
October 17, 1991

Amoco Production Company will on or before October 14, 1991, apply for administrative approval to drill five water injection wells in the South Hobbs (GSA) Unit. The well names, numbers, and locations are as follows:

South Hobbs (GSA) Unit No. 229	Unit C,	Sec. 4,	T-19-S,	R-38-E
South Hobbs (GSA) Unit No. 230	Unit B,	Sec. 4,	T-19-S,	R-38-E
South Hobbs (GSA) Unit No. 233	Unit G,	Sec. 4,	T-19-S,	R-38-E
South Hobbs (GSA) Unit No. 235	Unit K,	Sec. 4,	T-19-S,	R-38-E
South Hobbs (GSA) Unit No. 238	Unit O,	Sec. 4,	T-19-S,	R-38-E

The purpose of this work is to expand the South Hobbs (GSA) Unit Pressure Maintenance Project. Water will be injected into the Grayburg San Andres Formation at an average rate of 2000 BWIPD per well with an average injection pressure of 450 psi. Any questions concerning this project may be directed to:

Amoco Production Company
Attn: Mr. B. W. Abbott
Operation Foreman
P.O. Box 68
Hobbs, NM 88241
Phone: 505/397-8219

Interested parties must file objections or request for hearing with the Oil Conservation Division, P.O. Box 2088, Santa Fe, NM 87504-2088 within 15 days.

K.W. Brand
Administrative Services Manager
Amoco Production Company
P.O. Box 3092
Houston, TX 77253