Amoco Production Company
Post Office Box 68
Hobbs, New Mexico 88240

L. R. Smith
District Manager

September 24, 1985

File: SGH-1816-416

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

State of New Mexico
Energy and Minerals Department
Oil Conservation Division
P. O. Box 2088
Santa Fe, NM 87501

Amoco Production Company hereby requests administrative approval to convert two South Hobbs (GSA) Unit Wells to water injection. Form C-108 and necessary documentation is attached.

The two wells to be converted are:

South Hobbs (GSA) Unit No. 48	Unit J, 3300' FNL x 2310' FEL, Section 3, T-19-S, R-38-E, Lea County, NM
South Hobbs (GSA) Unit No. 68	Unit B, 660' FNL x 2310' FEL, Section 10, T-19-S, R-38-E, Lea County, NM

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 have any questions concerning this application, please contact Charles Herring in our Hobbs District Office, 505/393-1781, Extension 252.

Original Signed By
L.R. Smith

CMH/sh
APRD04-HHH

Attachments

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

SERVICE LIST

Offset Operators for Proposed Injection Wells

Shell Western E&P, Inc.
P. O. Box 991
Houston, TX 77001
Attention: D. J. Pfau

Cities Service Oil & Gas Corp.
P. O. Box 1919
Midland, TX 79702

Cola Petroleum, Inc.
601 N. Marienfeld
Suite 200
Midland, TX 79701

Surface Owners for Proposed Injection Wells

Amoco Production Company

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

II. Operator: Amoco Production Company

Address: P. O. Box 68, Hobbs, New Mexico 88240

Contact party: John M. Breeden Phone: (505) 393-1781

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 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: Charles M. Herring Title Administrative Analyst (SG)

Signature: Charles M. Herring Date: September 24, 1985

* 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. R-4934-A, 8-4-83; R-4934-B, 8-23-83; R-4934-C, 8-23-83

R-4934-D, 4-20-84

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.

AFFIDAVIT OF PUBLICATION

State of New Mexico,

County of Lea.

I, _____

Robert L. Summers

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 in a supplement thereof for a period

of _____

One _____ weeks.

Beginning with the issue dated

September 23, 19 85

and ending with the issue dated

September 23, 19 85

Robert L Summers
Publisher.

Sworn and subscribed to before me this 24 day of September, 1985

Vera Murphy
Notary Public.

My Commission expires

Nov. 14, 1988
(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
SEPTEMBER 23, 1985

TO WHOM IT MAY CONCERN:

Amoco Production Company will on or before September 24, 1985, apply for administrative approval to convert two producing South Hobbs (GSA) Unit Wells to water injection wells. The well names, numbers and locations are as follows:

Well Name and Number	Location
South Hobbs (GSA) Unit No. 48	Unit J, 3300' FNL x 2310' FEL, Sec. 3, T-19-S, R-38-E, Lea County, NM
South Hobbs (GSA) Unit No. 68	Unit B, 660' FNL x 2310' FEL, Sec. 10, T-19-S, R-38-E, Lea County, NM

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 1000 BWIPD with an average pressure of 500 psi. Any questions concerning this project may be directed to Mr. John Breeden, District Foreman, Amoco Production Company, P. O. Box 68, Hobbs, NM, 88240, Phone, 505/393-1781.

Interested parties must file objections or request for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico, 87501, within fifteen (15) days.

ITEM III

WELL DATA

SOUTH HOBBS UNIT
PRESSURE MAINTENANCE EXPANSION

III. Well Data

See attached data sheets for each proposed injection well.

V. See attached map covering "Area of Review".

VI. Previously submitted. See Form C-108.

VII. Proposed Operation Data

Average Injection Rate:	1000 BWPD
Average Injection Pressure:	500 PSI
Maximum Injection Rate:	1500 BWPD
Maximum Injection Pressure:	In accordance with Rule 11 of Order No. R-4934-E

VIII. Geological Data

The injection zone is approximately 200' section in the San Andres. This interval is predominantly comprised of dolomite. The top of the Rustler Anhydrite is considered the lower limit of potable water occurrence in this area. This is situated at approximately 1600'. The Ogallala formation is the primary fresh water source, generally found at approximately 200'.

IX. Proposed Stimulation Program

Initial stimulation will generally consist of approximately 4000 gallons of 15% HCl acid.

X. Well logs previously filed with the Division

XI. Fresh Water Analysis

See attached Water Analysis

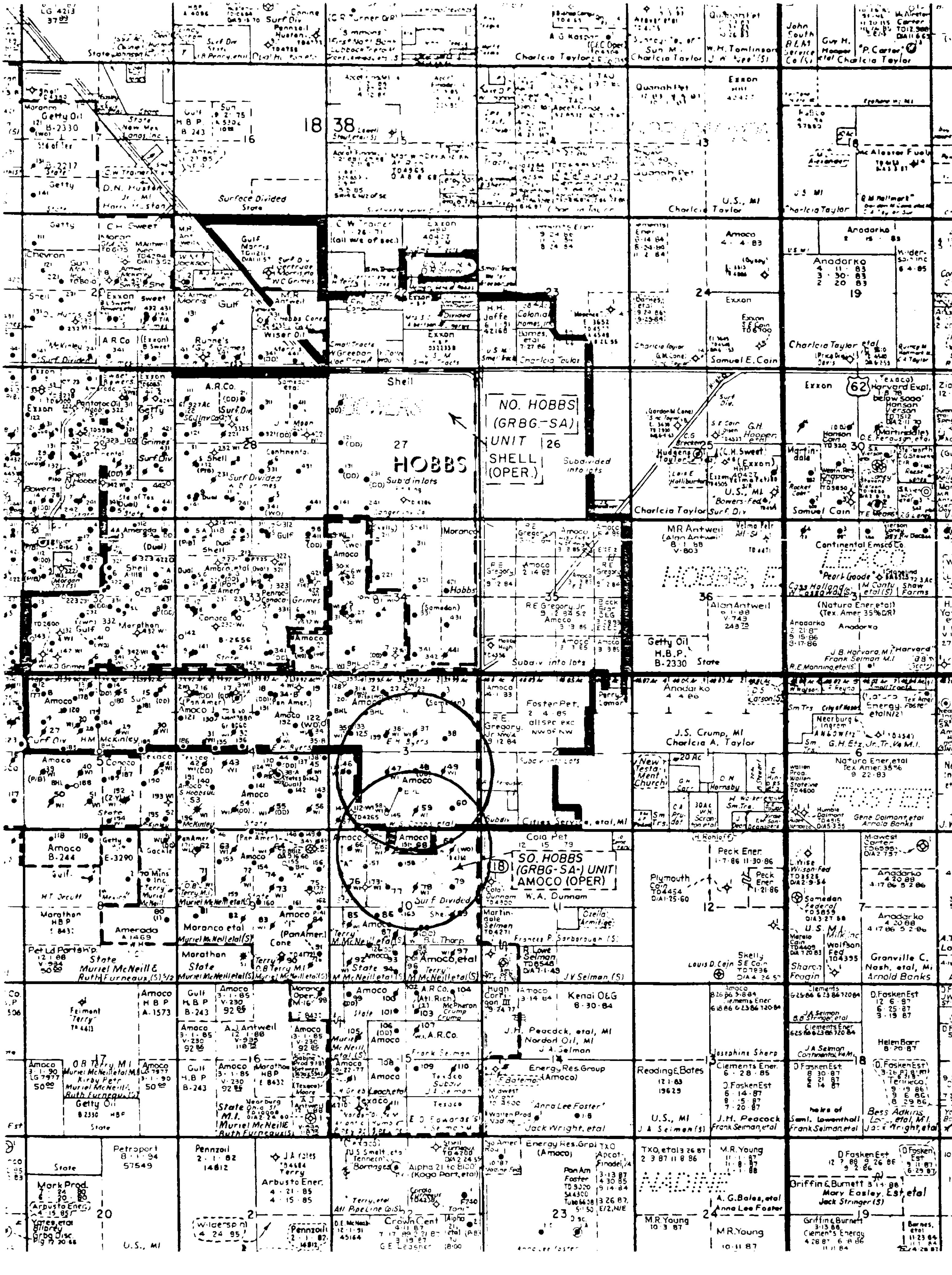
XII. All available geologic and engineering data have been examined and there is no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

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

SGS/sh
EPSEC7-LL

ITEM V

AREA OF REVIEW



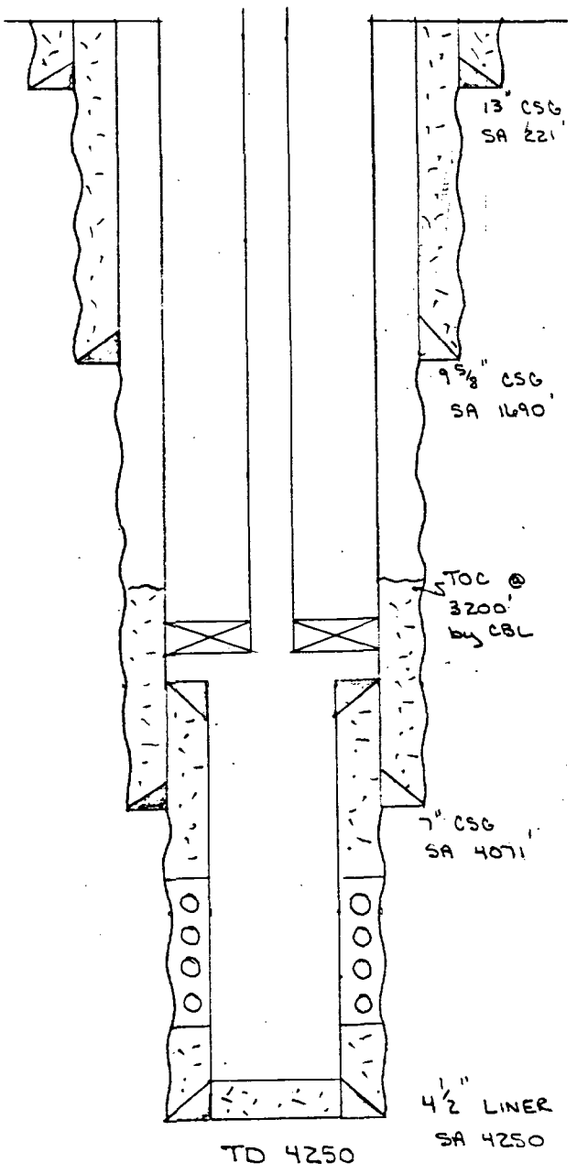
NO. HOBBS (GRBG-SA) UNIT SHELL (OPER.)
SO. HOBBS (GRBG-SA-) UNIT AMOCO (OPER)
HOBBS
Subd'd in lots
Shell
Amoco
Anadarko
Exxon
Getty Oil
Charlcia Taylor
Continental Emsco Co.
J.S. Crump, MI
Charlcia A. Taylor
Surface Divided
Subdivided into lots
Cola Pet
W. A. Dunnam
Peck Ener.
Kenai O&G
Energy Res.Group (Amoco)
Reading&Bates
Josephine Sharp
Clements Ener.
J.H. Peacock
D.Fasken Est
Griffin & Burnett
Mary Easley, Est, etal
Jack Stringer (S)
M.R.Young
A. G.Bales,etal
Anna Lee Foster
Petroport
Pennzoil
Arbusto Ener.
Crown Cent
U.S., MI
State

INJECTION WELL DATA SHEET

AMOCO PRODUCTION CO. (OPERATOR) SOUTH HOBBS UNIT (LEASE)

48 (WELL NO.) 3300 FNL x 2310 FEL (FOOTAGE LOCATION) 3 (SECTION) T-19-S (TOWNSHIP) R-38-E (RANGE)

Schematic



Tabular Data

Surface Casing

Size 13" Cemented with 175 sx.

TOC Surface feet determined by Calculated

Hole size 17 1/2" x 221'

Intermediate Casing

Size 9 5/8" Cemented with 560 sx.

TOC Surface feet determined by Calculated

Hole size 12 1/2" x 1690'

Long string

Size 7" Cemented with 290 sx.

TOC 3200' feet determined by CBL

Hole size 8 3/4" x 4071'

Total depth 4250'

Injection interval

4182 feet to 4234 feet
(perforated or open-hole, indicate which)

Liner

Size 4 1/2" Cemented with 100 sx.

TOC circulated

Hole size 6 1/8"

Tubing size 2 3/8" lined with PLASTIC (material) set in a

BAKER LOK-SET (brand and model) packer at 3800' feet

(or describe any other casing-tubing seal).

Other Data

1. Name of the injection formation SAN ANDRES

2. Name of Field or Pool (if applicable) HOBBS

3. Is this a new well drilled for injection? ☐ Yes ☒ No

If no, for what purpose was the well originally drilled? GRAYBURG - SAN ANDRES OIL PRODUCTION

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail (sacks of cement or bridge plug(s) used)

NONE

5. Give the depth to and name of any overlying and/or underlying oil or gas zones (pools) in this area.

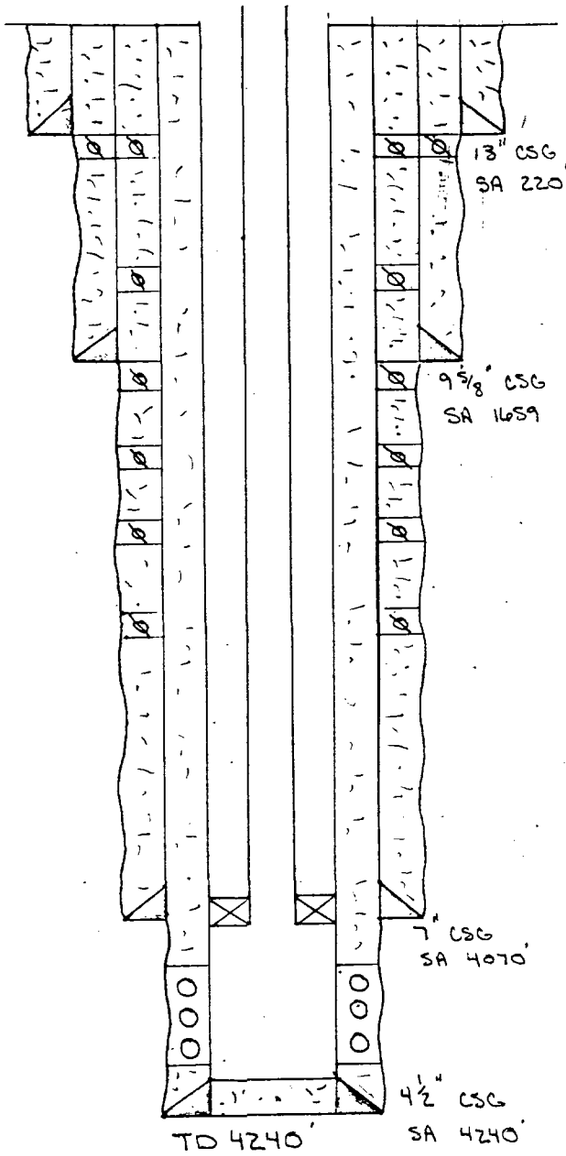
BOWERS - 3125'

INJECTION WELL DATA SHEET

Amoco Production Co. (OPERATOR) South Hobbs Unit (LEASE)

68 (WELL NO.) 660' FNL x 2310' FEL (FOOTAGE LOCATION) 10 (SECTION) T-19-S (TOWNSHIP) R-38-E (RANGE)

Schematic



Tabular Data

Surface Casing

Size 13" Cemented with 200 sx.

TOC Circulated feet determined by _____

Hole size 17" x 220'

Intermediate Casing

Size 9 5/8" Cemented with 375 sx.

TOC Circulated feet determined by _____

Hole size 12 1/4" x 1659'

Long string

Size 7" Cemented with 3550 sx.

TOC circulated feet determined by _____

Hole size 8 3/4" x 4070'

Total depth _____

Injection interval

4193 feet to 4226 feet

(perforated or open-hole, indicate which)

2nd Long string

Size 4 1/2" Cemented with 450 sx

TOC circulated

Hole size 6 1/8"

TD 4240'

Tubing size 2 3/8" lined with PLASTIC (material) set in a

BAKER LOK-SET (brand and model) packer at 4100 feet

(or describe any other casing-tubing seal).

Other Data

1. Name of the injection formation SAN ANDRES

2. Name of Field or Pool (if applicable) HOBBS

3. Is this a new well drilled for injection? ☐ Yes ☒ No

If no, for what purpose was the well originally drilled? GRAYBURG - SAN ANDRES OIL PRODUCTION

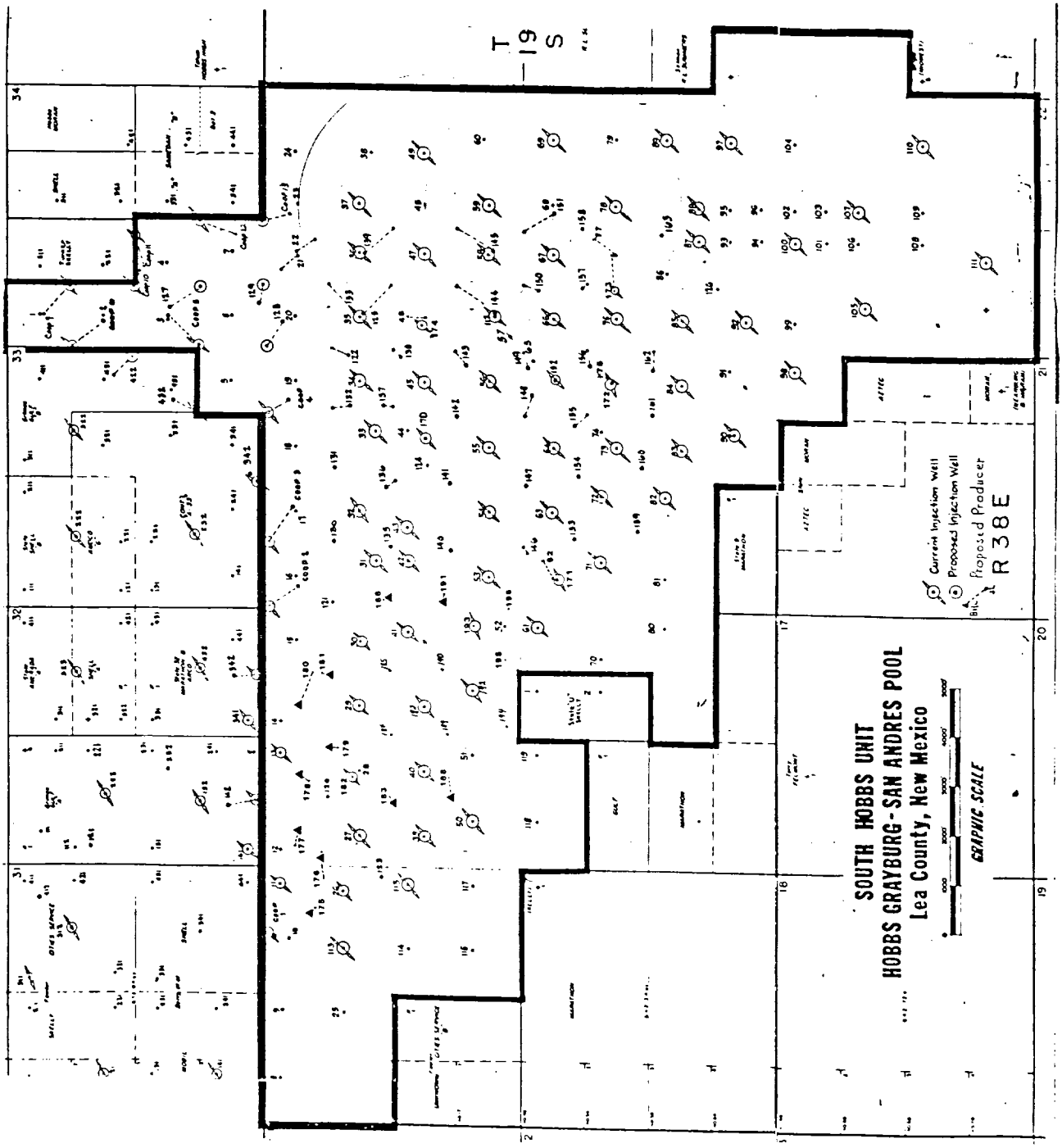
4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail (sacks of cement or bridge plug(s) used)

NONE

5. Give the depth to and name of any overlying and/or underlying oil or gas zones (pools) in this area.

BOWERS - 3125'

Attachment


T
19
S
R38E
SOUTH HOBBS UNIT
HOBBS GRAYBURG-SAN ANDRES POOL
Lea County, New Mexico
Current Injection Well
Proposed Injection Well
Proposed Producer
GRAPHIC SCALE

ITEM XI

FRESH WATER ANALYSIS

UNICHEM INTERNATIONAL

601 NORTH LEECH P.O.BOX1499

HOBBS. NEW MEXICO 88240

COMPANY : AMOCO
DATE : 8-24-84
FIELD.LEASE&WELL : SOUTH HOBBS UNIT - IRVIN
SAMPLING POINT:
DATE SAMPLED : 8-23-84

2200' FNL x 2030' FEL, Sec 5, T-19-S, R-38-E
≈125' Deep

SPECIFIC GRAVITY = 1
TOTAL DISSOLVED SOLIDS = 831
PH = 7.25

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	5.2	104.
MAGNESIUM	(MG)+2	3.3	40.1
SODIUM	(NA).CALC.	4.1	96.0
ANIONS			
BICARBONATE	(HCO3)-1	4.6	280.
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	2.0	100
CHLORIDES	(CL)-1	6	210
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		.2
BARIUM	(BA)+2	0	.09
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) =.018

SCALING INDEX	TEMP
	30C 86F
CARBONATE INDEX	1.54
CALCIUM CARBONATE SCALING	LIKELY
CALCIUM SULFATE INDEX	-16.
CALCIUM SULFATE SCALING	UNLIKELY

UNICHEM INTERNATIONAL

601 NORTH LEECH P.O.BOX1499

HOBBS, NEW MEXICO 88240

COMPANY : AMOCO
DATE : 8-24-84
FIELD.LEASE&WELL : SOUTH HOBBS UNIT - WALKER MACHINE
SAMPLING POINT:
DATE SAMPLED : 8-23-84 1330' FNL x 300' FWL, Sec 5, T-19-S, R-38-E
170' Deep

SPECIFIC GRAVITY = 1
TOTAL DISSOLVED SOLIDS = 604
PH = 7.16

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	3.2	64.1
MAGNESIUM	(MG)+2	4.3	52.2
SODIUM	(NA).CALC.	1.5	35.6
ANIONS			
BICARBONATE	(HCO3)-1	4.6	280.
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	.45	21.4
CHLORIDES	(CL)-1	4	150
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		.06
BARIUM	(BA)+2	0	.04
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) = .013

SCALING INDEX	TEMP
	30C 86F
CARBONATE INDEX	1.61
CALCIUM CARBONATE SCALING	LIKELY
CALCIUM SULFATE INDEX	-18.
CALCIUM SULFATE SCALING	UNLIKELY

UNICHEM INTERNATIONAL

601 NORTH LEECH P.O.BOX1499

HOBBS. NEW MEXICO 88240

COMPANY : AMOCO
DATE : 8-24-84
FIELD.LEASE&WELL : SOUTH HOBBS UNIT - WINDMILL
SAMPLING POINT:
DATE SAMPLED : 8-23-84 850 FNL x 1450 FEL, Sec 6, T-19-S, R-38-E ≈ 150' Deep

SPECIFIC GRAVITY = 1
TOTAL DISSOLVED SOLIDS = 711
PH = 7.23

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	4.4	88.1
MAGNESIUM	(MG)+2	.6	7.2
SODIUM	(NA).CALC.	5.8	135.
ANIONS			
BICARBONATE	(HCO3)-1	3.6	219.
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	1.2	61.5
CHLORIDES	(CL)-1	6	200
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		.2
BARIUM	(BA)+2	0	.08
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) =.014

SCALING INDEX	TEMP
	30C 86F
CARBONATE INDEX	1.64
CALCIUM CARBONATE SCALING	LIKELY
CALCIUM SULFATE INDEX	-17.
CALCIUM SULFATE SCALING	UNLIKELY

P 267 162 753

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL
(See Reverse)

CMH

SENT TO
Cola Petroleum, Inc.
STREET AND NO.
601 N. Marienfeld, Suite 200
P.O. STATE AND ZIP CODE
Midland, TX 79701

POSTAGE		$.73
CONSULT POSTMASTER FOR FEES	CERTIFIED FEE	.75 ¢
OPTIONAL SERVICES	SPECIAL DELIVERY	¢
	RESTRICTED DELIVERY	¢
RETURN RECEIPT SERVICE	SHOW TO WHOM AND DATE DELIVERED	.70 ¢
	SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY	¢
	SHOW TO WHOM AND DATE DELIVERED WITH RESTRICTED DELIVERY	¢
	SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY WITH RESTRICTED DELIVERY	¢
TOTAL POSTAGE AND FEES		$2.18
POSTMARK OR DATE		

PS Form 3800, Apr. 1976

P 267 162 752

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL
(See Reverse)

CMH

SENT TO
Cities Service Oil & Gas Corp.
STREET AND NO.
P.O. Box 1919
P.O. STATE AND ZIP CODE
Midland, TX 79702

POSTAGE		$.73
CONSULT POSTMASTER FOR FEES	CERTIFIED FEE	.75 ¢
OPTIONAL SERVICES	SPECIAL DELIVERY	¢
	RESTRICTED DELIVERY	¢
RETURN RECEIPT SERVICE	SHOW TO WHOM AND DATE DELIVERED	.70 ¢
	SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY	¢
	SHOW TO WHOM AND DATE DELIVERED WITH RESTRICTED DELIVERY	¢
	SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY WITH RESTRICTED DELIVERY	¢
TOTAL POSTAGE AND FEES		2.18
POSTMARK OR DATE		

PS Form 3800, Apr. 1976

P 267 162 751

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL
(See Reverse)

CMH

SENT TO
Shell Western E & P, Inc.
STREET AND NO.
P.O. Box 991
P.O. STATE AND ZIP CODE
Houston, TX 77001

POSTAGE		$.73
CONSULT POSTMASTER FOR FEES	CERTIFIED FEE	.75 ¢
OPTIONAL SERVICES	SPECIAL DELIVERY	¢
	RESTRICTED DELIVERY	¢
RETURN RECEIPT SERVICE	SHOW TO WHOM AND DATE DELIVERED	170 ¢
	SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY	¢
	SHOW TO WHOM AND DATE DELIVERED WITH RESTRICTED DELIVERY	¢
	SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY WITH RESTRICTED DELIVERY	¢
TOTAL POSTAGE AND FEES		$2.18
POSTMARK OR DATE		

SEP 1985

PS Form 3800, Apr. 1976