Texaco USA

P. O. Box 728
Hobbs, NM 88240
(505) 393-7191

September 4, 1987

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

Attention: Mr. David Catanach

RE: Conversion to Salt Water Disposal
Mexico "F" Well No. 4
Unit Letter D, Sec. 2, T-15-S, R-37-E
Lea County, New Mexico

Gentlemen:

Texaco Producing Inc. respectfully requests administrative approval of the referenced application by provisions in Rule 701.B.3 and 701.D.

In support of this application, you will find attached:

1) Form C-108
2) Map identifying wells and leases within 2-mile radius and the 1/2 mile radius area of review.
3) Table containing data on wells in area of review that penetrate the disposal zone.
4) Schematics of plugged wells in the area of review.
5) Injection well data sheet.
6) List of affected offset operators and surface owner.
7) Letters mailed to offset operators and surface owner notifying them of this application.
8) Chemical analysis of waters to be injected and disposal zone water.
9) Affidavit of publication and copy of legal notice.

Average injection rate into the well will be 500 barrels per day with a maximum of 1000 barrels per day. Average injection pressure will be 0 and the maximum pressure will be 100 PSI. The well will be stimulated with 2000 gallons of 15% NEFE acid.

Injection will be into the Devonian formation at a depth of 12,160 feet to 12,306 feet.

The Ogallala Aquifer lies above the disposal zone at approximately 90'-150' below the surface. The only fresh water well near the lease is located approximately 1.5 miles North of the lease. An analysis of water from this well is attached.

Texaco Producing has examined available geologic and engineering data and found no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

Your timely consideration of this application will be greatly appreciated.

Yours very truly,

L. J. Seeman

L. J. Seeman
District Petroleum Engineer

LDR:JRB

Attachments

cc: NMOCD
Hobbs, NM

ENERGY AND MINERALS DEPARTME

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: Texaco Producing Inc.

Address: P. O. Box 728, Hobbs, New Mexico 88240

Contact party: L. J. Seeman Phone: 505-393-7191

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: L. J. Seeman Title District Petroleum Engineer

Signature: L. J. Seeman Date: September 4, 1987

* 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;

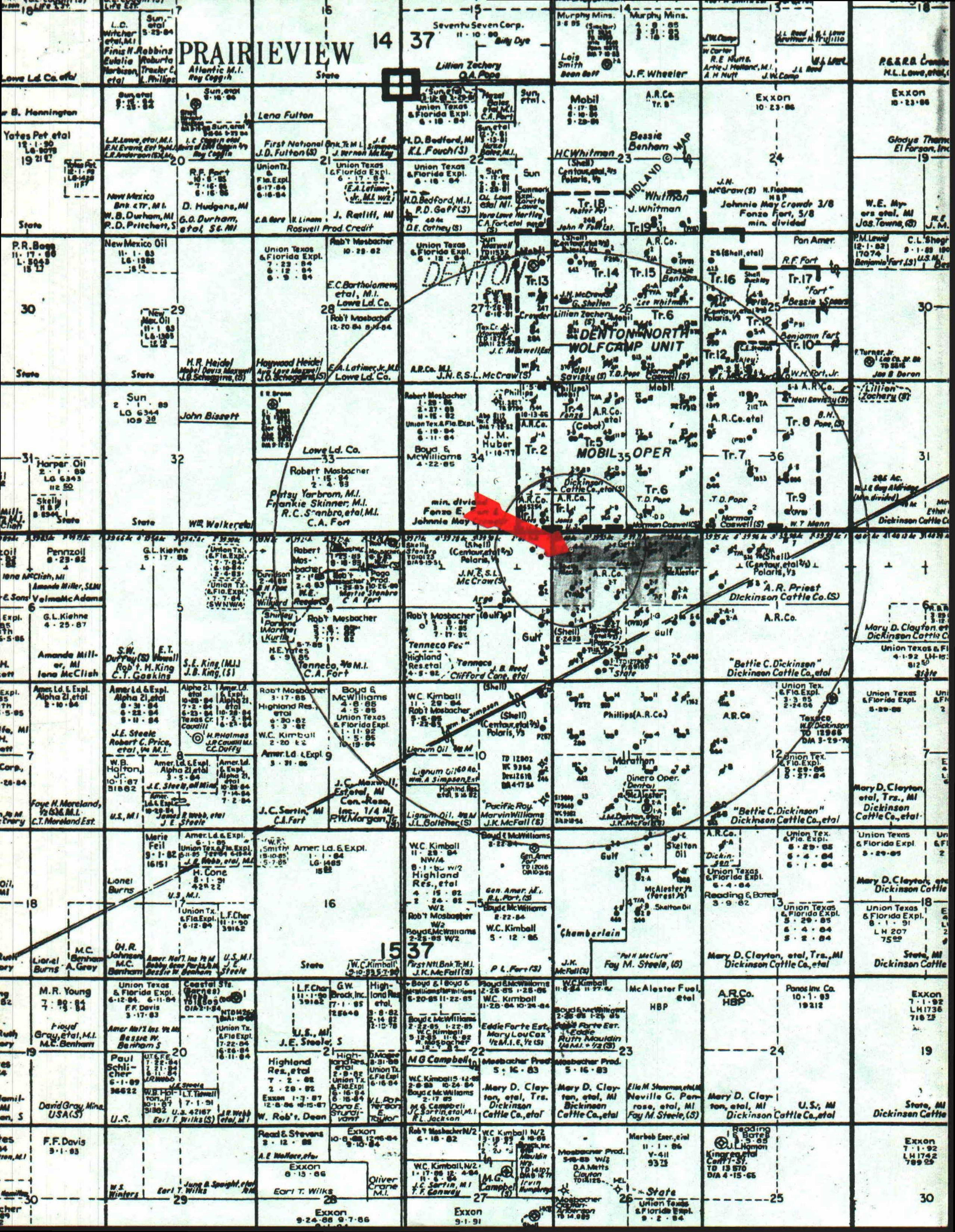
(2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;

(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.


PRAIRIEVIEW
14 37
DENTON
DENTON NORTH
WOLFCAMP UNIT
MOBIL 35 OPER
MIDLAND © MAP
15 37
Seventu Seven Corp.
Murphy Mins.
J.F. Wheeler
Lena Fulton
Exxon
Yates Pet etal
Bessie Benham
Roswell Prod. Credit
Robert Mosbacher
Lowe Ld. Co.
John Bissett
Pennzoil
G.L. Kiehne
Dickinson Cattle Co.
A.R. Priest
Gulf
Phillips(A.R.Co.)
Marathon
Dinero Oper.
"Bettie C.Dickinson"
Dickinson Cattle Co.,etal
Chamberlain
Fay M. Steele, (S)
McAlester Fuel, etal
Mary D. Clayton, etal, Trs., MI
Earl T. Wilks
F.F. Davis
M.R. Young
State

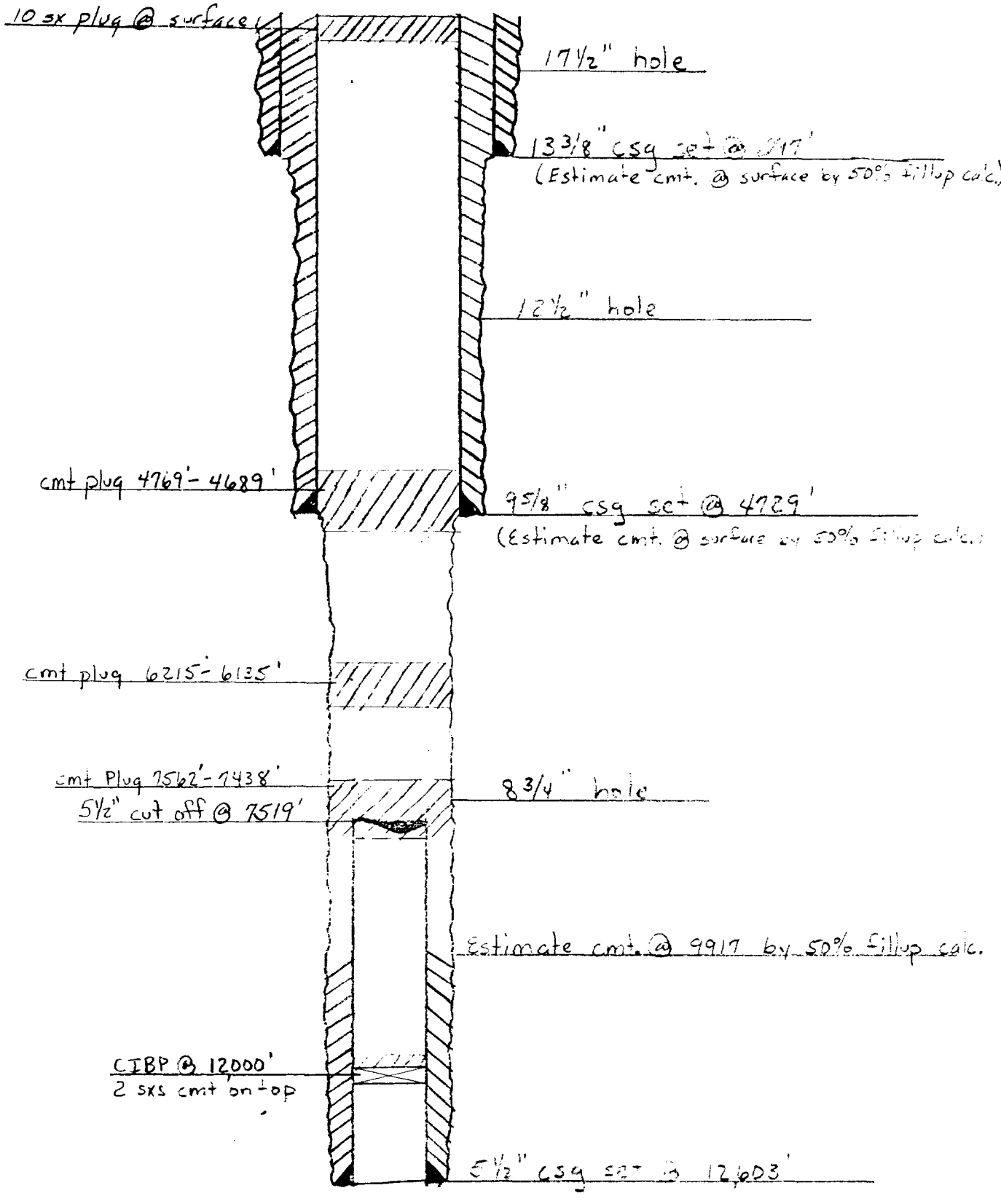
WELLS WITHIN 1/2 MILE RADIUS OF TPI's MEXICO "F" WELL NO. 4
THAT PENETRATE THE PROPOSED INJECTION ZONE

Operator, Well Name & No.	Formation	Total Depth	Date Drilled	Current Status	Hole Size	Casing Size	Depth	Cement (sx)	TOC	Determined By
Arco										
Jones Federal No. 1	Devonian	12,700'	7/23/51	P & A	18"	13-3/8"	314'	475	Surface	Circulated
660' FSL & 660' FWL					12-1/4"	9-5/8"	4,677'	3000	Surface	Circulated
Sec. 35, T-14-S, R-37-E					8-5/8"	7"	12,697'	855	9,054'	Calc. 50% fillup
B. C. Dickinson A-34 No. 2	Devonian	12,603'	3/01/53	P & A	17-1/2"	13-3/8"	297'	350	Surface	Calc. 50% fillup
1650' FSL & 330' FEL					12-1/2"	9-5/8"	4,729'	3000	Surface	Calc. 50% fillup
Sec. 34, T-14-S, R-37-E					8-3/4"	5-1/2"	12,603'	1150	9,917'	Calc. 50% fillup
Mobil										
T. D. Pope Well No. 1	Devonian	12,702'	10/30/51	Producing	17-1/2"	13-3/8"	411'	500	Surface	Circulated
1980' FEL & 660' FSL					11"	8-5/8"	4,746'	3699	Surface	Circulated
Sec. 35, T-14-S, R-37-E					7-7/8"	5-1/2"	12,487'	1793	930'	TS
Denton N. Wolfcamp Ut.										
Trt. 1, No. 2	Wolfcamp	12,536'	6/24/52	P & A	17-1/2"	13-3/8"	324'	350	Surface	Circulated
330' FSL & 330' FEL					12-1/4"	9-5/8"	4,754	3000	Surface	Circulated
Sec. 34, T-14-S, R-37-E					8-3/4"	7"	12,536	750	11,824'	Calc.
Hondo										
State T Well No. 2	Devonian	12,713'	3/17/51	Producing	17-1/2"	13-3/8"	320'	375	Surface	Circulated
1980' FNL & 1980' FWL					12-1/4"	9-5/8"	4,689'	2500	23'	Calc. 50% fillup
Se. 2, T-15-S, R-37-E					8-3/4"	7"	10,580'	925	6,950'	Calc. 50% fillup
					(Liner)	5"	10215'-12713'	200	10,215'	Calc. 50% fillup
Polaris										
State A Well No. 2	Devonian	12,500'	8/22/51	Producing	17-1/4"	13-3/8"	356'	300	Surface	Circulated
1980' FSL & 660' FWL					11"	8-5/8"	4,680'	3500	Surface	Circulated
Sec. 2, T-15-S, R-37-E					7-7/8"	5-1/2"	12,500'	750	8,240'	TS
Argo Well No. 2	Devonian	12,691'	2/16/52	Producing	17-1/4"	13-3/8"	326'	325	Surface	Circulated
990' FNL & 330' FEL					11"	8-5/8"	4,742'	3500	Surface	Circulated
Sec. 3, T-15-S, R-37-E					7-7/8"	5-1/2"	12,082'	1000	8,677'	Calc. 50% fillup
Argo Well No. 1	Devonian	12,690'	11/13/51	Producing	17-1/4"	13-3/8"	374'	325	Surface	Circulated
660' FNL & 660' FEL					11"	8-5/8"	4,655'	3500	Surface	Circulated
Sec. 3, T-15-S, R-37-E					7-7/8"	5-1/2"	12,500'	1150	8,584'	Calc. 50% fillup
Texaco Producing Inc.										
Mexico "F" Well No. 1	Devonian	12,887'	5/19/51	Producing	18"	13-3/8"	355'	350	Surface	Circulated
660' FNL & 1980' FWL					12-1/4"	9-5/8"	4,820'	3600	Surface	Circulated
Sec. 2, T-15-S, R-37-E					7-7/8"	5-1/2"	12,887'	1500	4,695'	TS
Mexico "F" Well No. 3	Devonian	12,732'	11/10/51	Producing	18"	13-3/8"	345'	225	Surface	Circulated
1980' FNL & 660' FWL					12-1/4"	8-5/8"	4,800'	3500	Surface	Circulated
Sec. 2, T-15-S, R-37-E					7-7/8"	5-1/2"	12,732'	1420	3,298'	TS
Mexico "F" Well No. 5	Devonian	12,600'	5/05/52	Producing	18"	13"	331'	350	Surface	Circulated
660' FNL & 1980' FEL					12-1/4"	9-5/8"	4,792'	3250	Surface	Circulated
Sec. 2, T-15-S, R-37-E					7-7/8"	5-1/2"	12,600'	1705	6,794'	Calc. 50% fillup

OPERATOR: ARCO

B. C. Dickinson A-34 No. 2

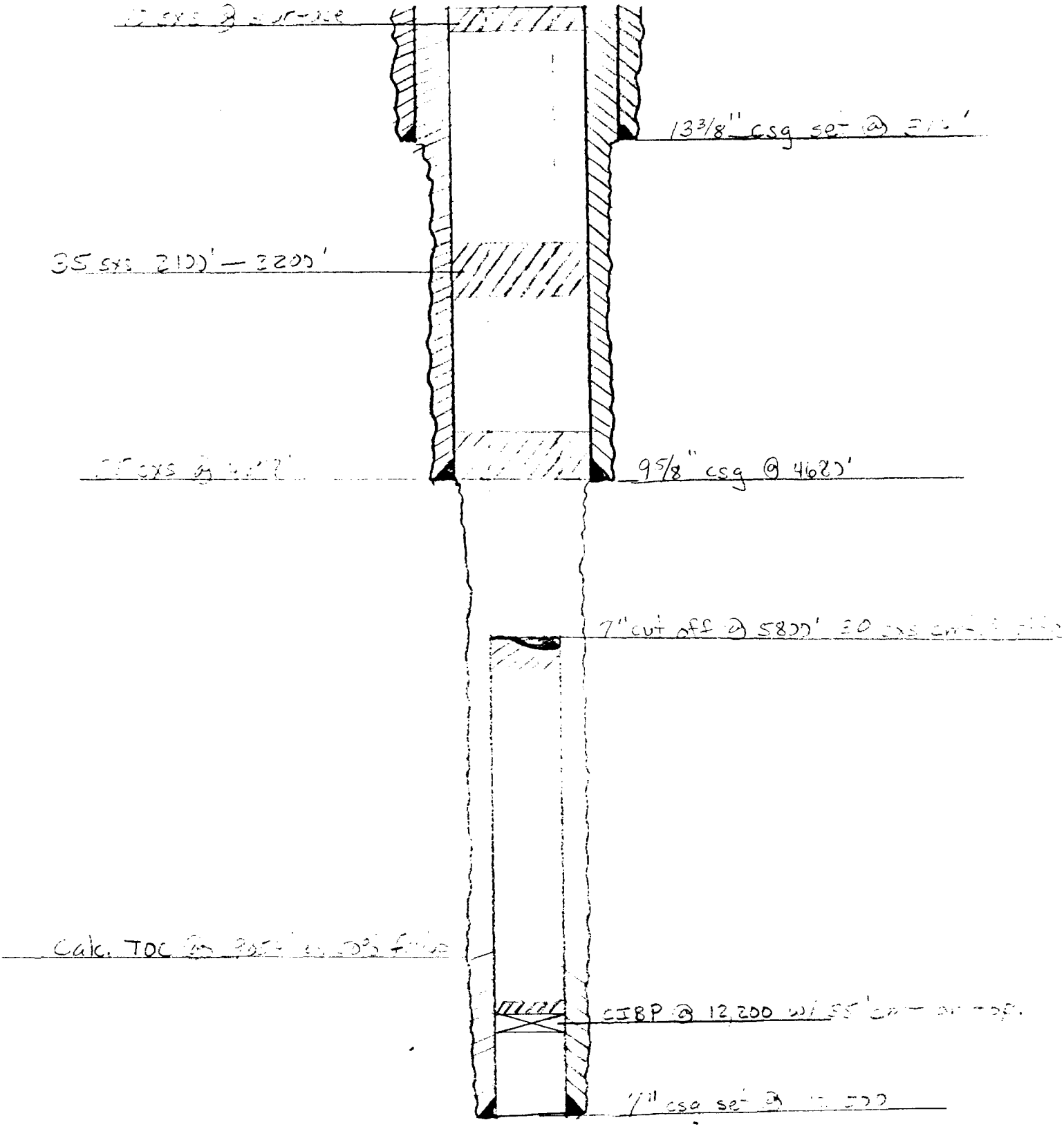
1650' FSL + 330' FEL Sec. 34, T-14-S, R-37-E



OPERATOR: Arco

Jones Federal Well No. 1

660' FSL + 660' FWL sec 35, T-14-S, R-37-E



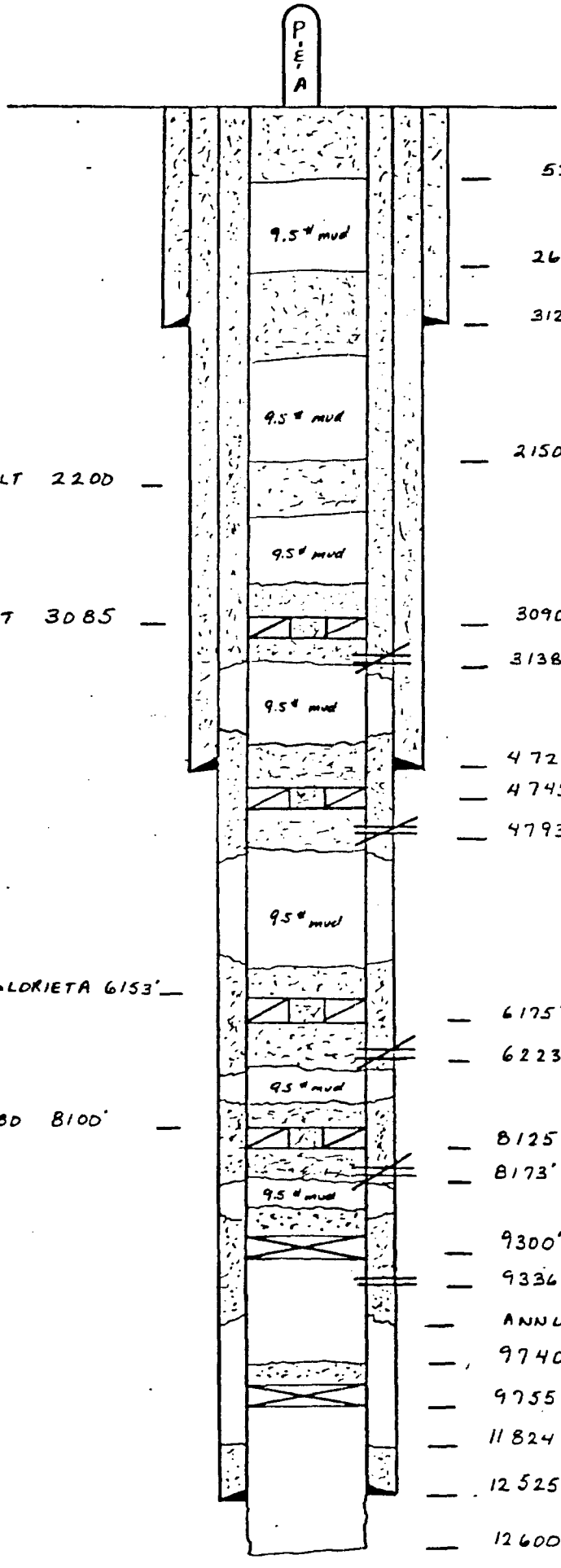
DATE 7-15-85 WELL NO 1-2 LEASE DNWU FIELD DNW

LOCATION 34-P, 14S, 37E
LEA CO. NEW MEXICO

SIGNED M.E. VASICEK

G.L. ____
D.F. 3822
K.B. ____
ZERO

PROPOSED



53' 50' SURFACE PLUG

262'-362' CMT PLUG OVER 13 3/8" CSG SHOE

312' 13 3/8" CSG SET W/ 350 Sx CMT CIRC

2150'-2250' CMT PLUG OVER T SALT

3090' 7" CMT. RET. CAPPED W/ 50' CMT (PLUG @ 3040'-314(

3138'-3140' PERFS 4JSPF (8 HOLES) SQZD W/ 425 Sx. CMT. C

4721' 9 5/8" CSG SET W/ 3000 Sx CMT CIRC

4745' 7" CMT. RET. CAPPED W/ 100' CMT (PLUG @ 4645'-4795

4793'-4795' PERFS 4JSPF (8 HOLES) SQZD W/ 35 Sx. CMT.

T GLORIETA 6153'

6175' 7" CMT. RET. CAPPED W/ 100' CMT. (PLUG @ 6075'-622

6223'-6225' PERFS 4JSPF (8 HOLES) SQZD W/ 35 Sx. CMT.

T ABO 8100'

8125' 7" CMT. RET. CAPPED W/ 100' CMT. (PLUG @ 8025'-8175'

8173'-8175' PERFS 4JSPF (8 HOLES) SQZD W/ 35 Sx. CMT.

9300' 7" CIBP CAPPED W/ 35' CMT

9336'-9362' WOLFCAMP PERFS

ANNULUS SQZD W/ 125 Sx CMT.

9740' PBTD

9755' CIBP CAPPED W/ 2 Sx CMT.

11824' TOP CMT. (CALC.)

12525' 7" CSG SET W/ 225 Sx

12600' TD

INJECTION WELL DATA SHEET

OPERATOR	LEASE			
Texaco Producing Inc.	Mexico "F"			
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE
4	660' FNL & 660' FWL	2	15-S	37-E

Schematic

See Attachment

Tabular Data

Surface Casing

Size 13-3/8" Cemented with 300 sx.

TOC Surface feet determined by Circulated

Hole size 17-1/2"

Intermediate Casing

Size 9-5/8" Cemented with 1660 sx.

TOC 144 feet determined by Temp. Survey

Hole size 12-1/4"

Long string

Size 5-1/2" Cemented with 1925 sx.

TOC 5065 feet determined by Temp. Survey

Hole size 7-7/8"

Total depth 12,550' (PBTD - 12,314')

Injection interval

12,160 feet to 12,306 feet

(perforated or ~~open-hole~~, indicate which)

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

Baker Lockset (brand and model) packer at 12,100 feet

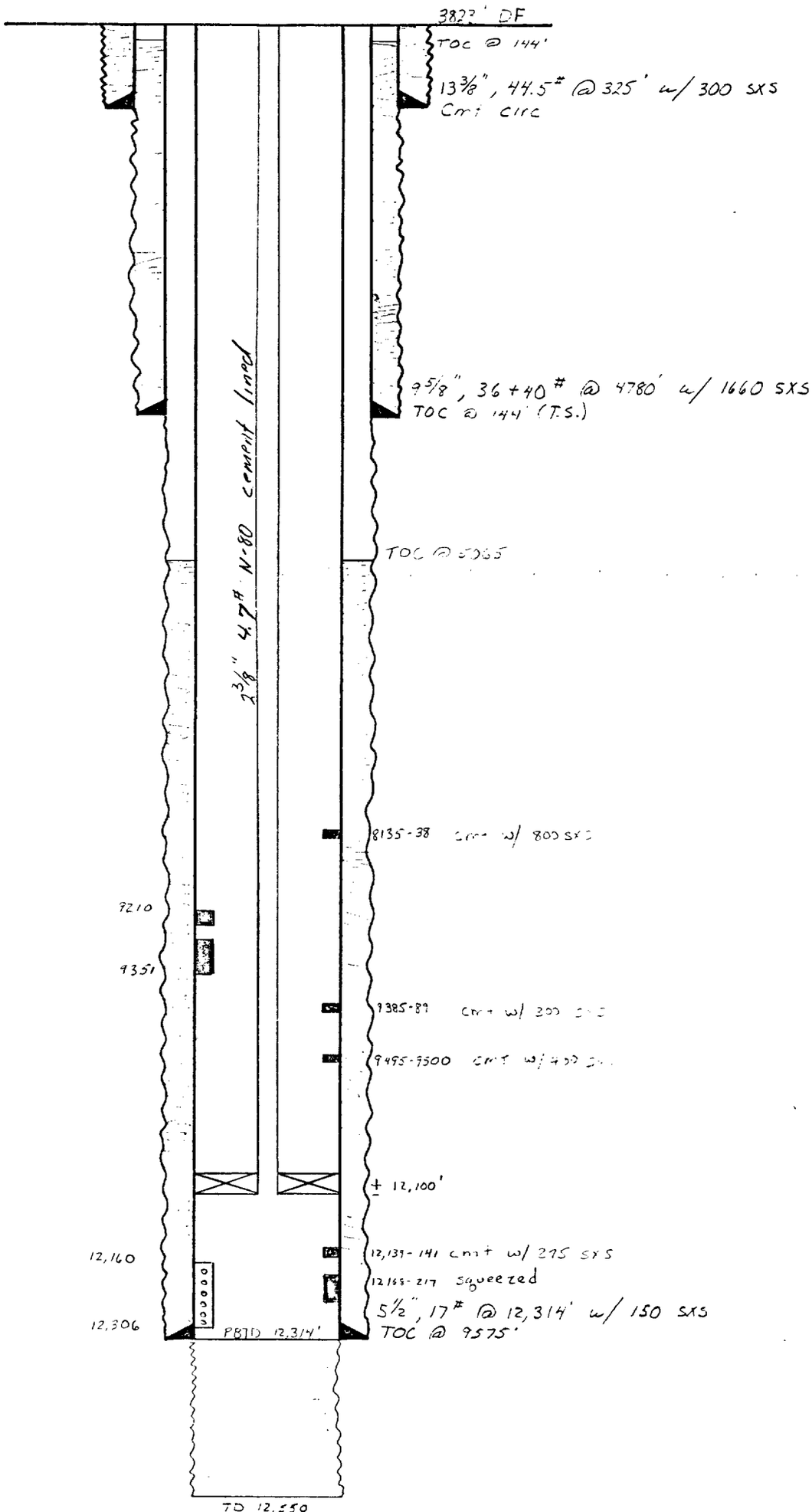
(or describe any other casing-tubing seal).

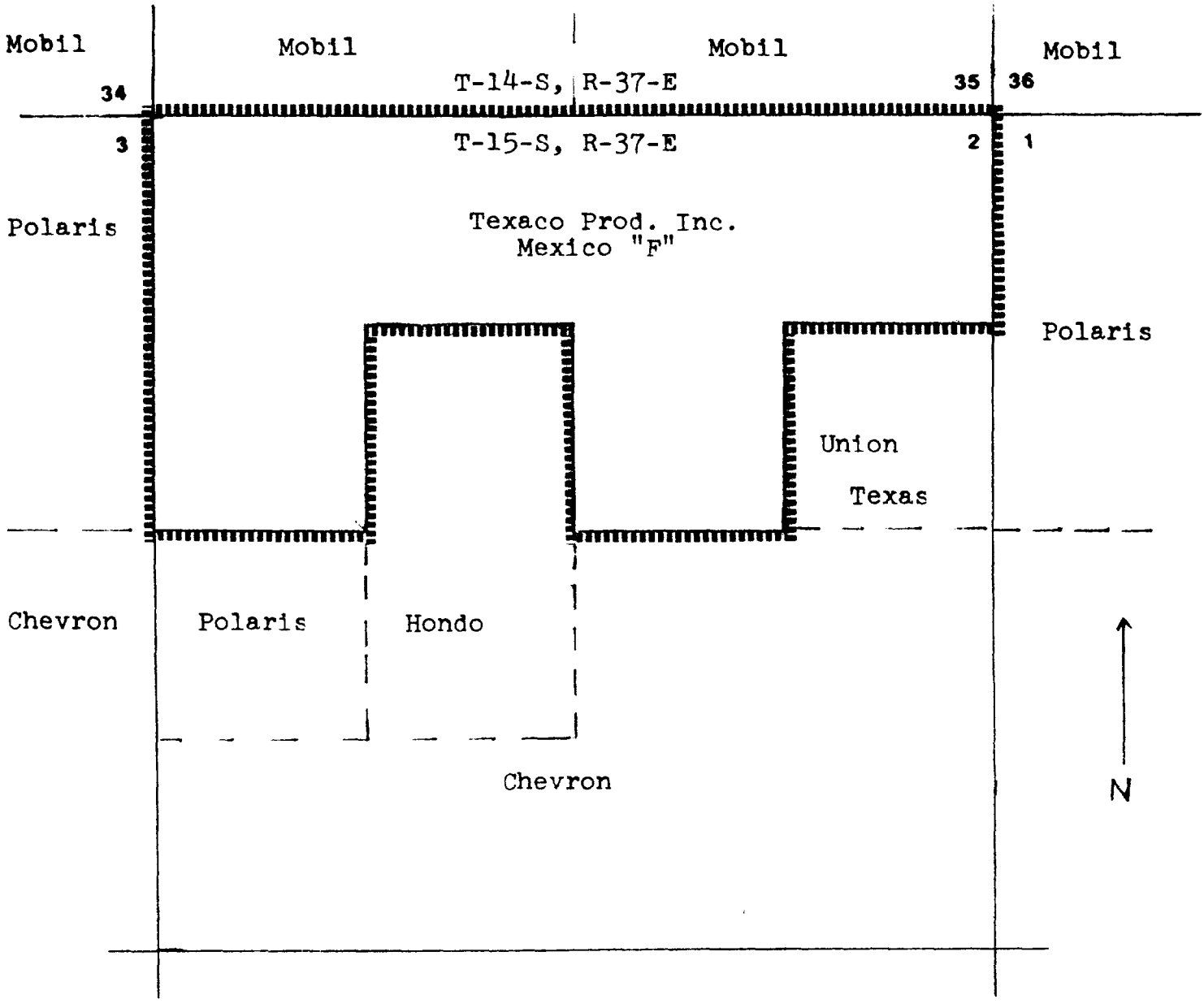
Other Data

1. Name of the injection formation Devonian
2. Name of Field or Pool (if applicable) Denton Devonian
3. Is this a new well drilled for injection? [ ] Yes [X] No

   If no, for what purpose was the well originally drilled? 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) Wolfcamp 9210'-9351' will be squeezed w/200 sacks Class "H" during SWD Conversion.
5. Give the depth to and name of any overlying and/or underlying oil or gas zones (pools) in this area. Wolfcamp 9200'

Mexico F #4
Proposed





Texaco Producing Inc.
Mexico "F" Lease
Lea County, New Mexico
1" = 1000'

OFFSET OPERATORS
MEXICO "F" LEASE
LEA COUNTY, NEW MEXICO

Chevron USA, Inc.
Box 670
Hobbs, New Mexico 88240

Hondo Oil & Gas Co.
Box 2819
Dallas, Texas 75221

Mobil Producing TX & NM, Inc.
Nine Greenway Plaza, Ste. 2700
Houston, Texas 77046

Polaris Production Corp.
Box 1749
Midland, Texas 79702

Union Texas Petroleum
4000 N. Big Spring, Ste. 500
Midland, Texas 79705

SURFACE OWNER

State Owned Leased To:

Dickinson Cattle Co.
Box 3804
Amarillo, Texas 79106

September 4, 1987

OFFSET OPERATORS
(List Attached)

RE: Conversion to Salt Water Disposal
Mexico "F" Well No. 4
Unit Letter D, Sec. 2, T-15-S, R-37-E
Lea County, New Mexico

Gentlemen:

This is to notify you, as an Offset Operator, that Texaco Producing Inc. is requesting the New Mexico Oil Conservation Division to approve disposal of water into the Devonian formation at a depth of 12,160'-12,306' into the referenced well. A copy of the legal notice and a plat are attached for your information.

Objections to this request or a request for hearing should be filed with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico, 87501, within fifteen (15) days following receipt of this letter.

Yours very truly,

L. J. Seeman

L. J. Seeman
District Petroleum Engineer

LDR:JRB

Attachments

Texaco USA

P O Box 728
Hobbs NM 88240
505 393 7191

September 4, 1987

Dickinson Cattle Company
Box 3804
Amarillo, Texas 79106

RE: Conversion to Salt Water Disposal
Mexico "F" Well No. 4
Lea County, New Mexico

Gentlemen:

In compliance with New Mexico Oil Conservation Division Rule 701.B.2, Texaco Producing Inc. hereby notifies you that an application to convert the referenced well to a salt water disposal has been submitted to the Oil Conservation Division. The water will be injected into the Devonian formation at a depth of 12,160'-12,306'. The well is located 660' FNL & 660' FWL of Section 2, T-15-S, R-37-E.

Only the surface area absolutely required will be used in operating the well. The well is cased and cemented in such a way that all surface and subsurface fresh waters will be protected.

Objections to this request or a request for hearing should be filed with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico, 87501, within fifteen (15) days following receipt of this letter.

A copy of the legal notice and a map are attached for your information. If there are any questions, please do not hesitate to call this office.

Yours very truly,

J. A. Schaffer
District Operations Manager

LDR:JRB

Attachments

P-562 874 898

T FOR CERTIFIED MAIL

Union Texas Petr.
4000 N. Big Spring Ste 500
Midland, Tx 79705

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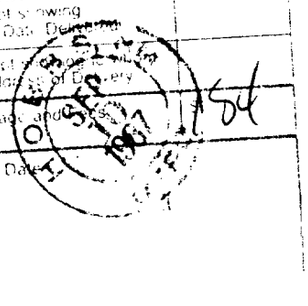
PS Form 3800, June 1985



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P-562 874 901

Dickinson Cattle Co
Box 3804
Amarillo, Tx 79106

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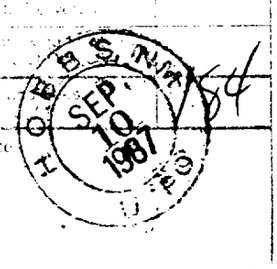
PS Form 3800, June 1985



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P-562 874 900

Chevron USA Inc
Box 670
Hobbs, N.M. 88240

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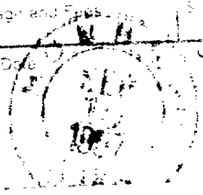
PS Form 3800, June 1985



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P-562 874 899

Polaris Production Corp.
Box 1749
Midland, Tx 79702

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PS Form 3800, June 1985

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P-562 874 902

Mobil Prod. Tx & NM Inc.
Nine Greenway Plaza, Ste 2700
Houston, Tx 77046

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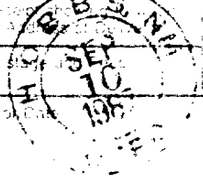
PS Form 3800, June 1985



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Hondo Oil & Gas Co
Box 2819
Dallas, Tx 75221

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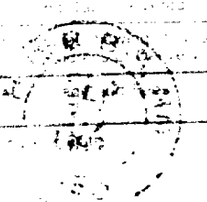
PS Form 3800, June 1985



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NL TREATING CHEMICALS
NL INDUSTRIES, INC.

SCALING TENDENCIES OF WATERS

COMPANY: TEXACO PRODUCING
SAMPLE POINT: WELL #9 (WOLFCAMP)
LOCATION: MEXICO F
DATE: 7/23/87

WATER ANALYSIS (MG/L):

SODIUM	31031.6
CALCIUM	2440.0
MAGNESIUM	292.8
CHLORIDE	50000.0
SULFATE	2250.0
BICARBONATE	1165.1
IRON	1.6
BARIUM	0.0
STRONTIUM	0.0
PH:	6.6
IONIC STRENGTH =	1.5825

INDEX VALUES GREATER THAN ZERO INDICATE SCALING CONDITIONS
INDEX VALUES OF ZERO OR LESS INDICATE A STABLE WATER

TEMP.	CALCITE INDEX	GYPSUM INDEX	ANHYDRITE INDEX	BARITE INDEX	STRONTIUM INDEX
60	0.18	-0.21	-0.51	-42.00	-1.00
80	0.28	-0.22	-0.41	-42.11	-1.00
100	0.41	-0.22	-0.32	-42.22	-1.00
120	0.59	-0.23	-0.24	-42.34	-1.00
140	0.81	-0.22	-0.15	-42.45	-1.00
160	1.07	-0.22	-0.06	-42.56	-1.00
180	1.38	-0.21	0.05	-42.67	-1.00
200	1.73	-0.20	0.16	-42.78	-1.00
220	2.13	-0.19	0.28	-42.87	-1.00
240	2.58	-0.17	0.41	-42.94	-1.00
260	3.07	-0.15	0.55	-42.95	-1.00

WATER ANALYSIS REPORT

NL Treating Chemicals /NL Industries, Inc.
P. O. Box 4305 Houston, Texas 77210

SHEET NUMBER

COMPANY: TEXACO Producing

DATE: 7/23/87

FIELD:

COUNTY OR PARISH: LEA

STATE: N.M.

LEASE OR UNIT: Mexico F

WELL(S) NAME OR NO.: #9

WATER SOURCE (FORMATION):

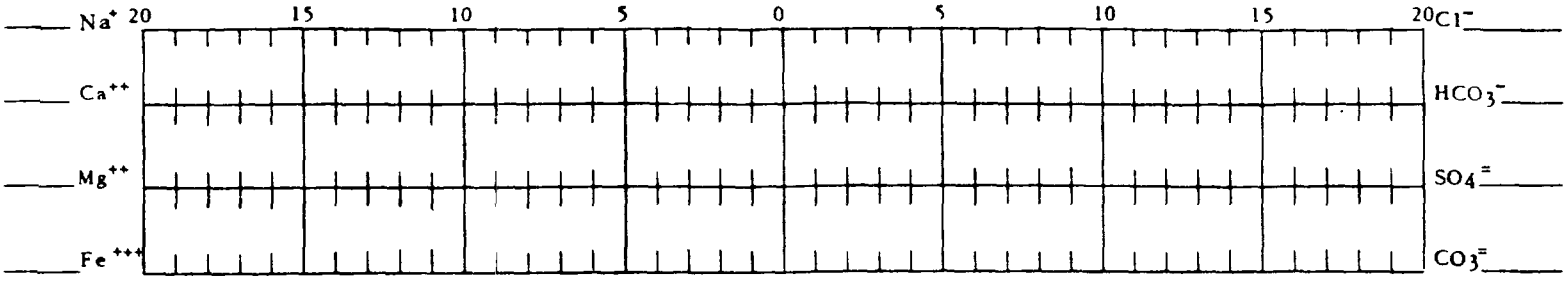
DEPTH, FT.	BHT, F	SAMPLE SOURCE	TEMP, F	WATER, BBL/DAY	OIL, BBL/DAY	GAS, MMCF/DAY
		Wellhead				

DATE SAMPLED: 7/23/87

TYPE OF WATER: [X] PRODUCED [ ] SUPPLY [ ] WATERFLOOD [ ] SALT WATER DISPOSAL

WATER ANALYSIS PATTERN

(NUMBER BESIDE ION SYMBOL INDICATES me/l* SCALE UNIT)



DISSOLVED SOLIDS

CATIONS	me/l*	mg/l*
Total Hardness	146	
Calcium, Ca^{++}	122	3440
Magnesium, Mg^{++}	24	292.8
Iron (Total) Fe^{+++}	0.1	1.6
Barium, Ba^{++}		
Sodium, Na^{+}(calc.)	1349.2	31031.6
ANIONS		
Chloride, Cl^{-}	1408.5	50000
Sulfate, $SO_4^{=}$	46.9	2250
Carbonate, $CO_3^{=}$		
Bicarbonate, HCO_3^{-}	19.1	1165.1
Hydroxyl, OH^{-}		
Sulfide, S=	20.8	333.3

DISSOLVED GASES

Hydrogen Sulfide, H_2S	_____ mg/l*
Carbon Dioxide, CO_2	_____ mg/l*
Oxygen, O_2	_____ mg/l*

PHYSICAL PROPERTIES

pH	6.65
Eh (Redox Potential)	_____ MV
Specific Gravity	_____
Turbidity, JTU Units	_____
Total Dissolved Solids (calc.)	97514 mg/l*
Stability Index @___F	_____
@___F	_____
$CaSO_4$ Solubility @___F	_____ mg/l*
@___F	_____ mg/l*
Max. $CaSO_4$ Possible (calc.)	_____ mg/l*
Max. $BaSO_4$ Possible (calc.)	_____ mg/l*
Residual Hydrocarbons	_____ ppm(Vol/Vol)

SUSPENDED SOLIDS (QUALITATIVE) R - 0.12 @ 68°

Iron Sulfide [ ] Iron Oxide [ ] Calcium Carbonate [ ] Acid Insoluble [ ]

*NOTE: me/l and mg/l are commonly used interchangeably for epm and ppm respectively. Where epm and ppm are used, corrections should be made for specific gravity.

REMARKS AND RECOMMENDATIONS:

Complete H_2O + 7c Background Info.

BTC ENGINEER	DIST. NO.	ADDRESS	OFFICE PHONE	HOME PHONE
Mike Brown	821	P.O. Box 1697 Hobbs, N.M.	392-1518	

ANALYZED: [illegible]

DATE: 7/24/87

DISTRIBUTION: [ ] CUSTOMER [ ] AREA OR [ ] DISTRICT OFFICE [ ] BTC ENGINEER OR [ ] BTC LAB [ ] BTC SALES SUPERVISOR

NL TREATING CHEMICALS
NL INDUSTRIES, INC.

SCALING TENDENCIES OF WATERS

COMPANY: TEXACO PRODUCING
SAMPLE POINT: WELL #3 (DEVONIAN)
LOCATION: MEXICO F
DATE: 7/23/87

WATER ANALYSIS (MG/L):

SODIUM	26555.8
CALCIUM	2760.0
MAGNESIUM	268.4
CHLORIDE	45500.0
SULFATE	1075.0
BICARBONATE	573.4
IRON	0.4
BARIUM	0.0
STRONTIUM	0.0
PH:	7.2
IONIC STRENGTH =	1.4062

INDEX VALUES GREATER THAN ZERO INDICATE SCALING CONDITIONS
INDEX VALUES OF ZERO OR LESS INDICATE A STABLE WATER

TEMP.	CALCITE INDEX	GYPSUM INDEX	ANHYDRITE INDEX	BARITE INDEX	STRONTIUM INDEX
60	0.52	-0.45	-0.74	-41.96	-1.00
80	0.61	-0.46	-0.64	-42.07	-1.00
100	0.75	-0.46	-0.55	-42.19	-1.00
120	0.92	-0.46	-0.47	-42.30	-1.00
140	1.14	-0.46	-0.38	-42.42	-1.00
160	1.40	-0.45	-0.28	-42.53	-1.00
180	1.70	-0.44	-0.18	-42.63	-1.00
200	2.04	-0.43	-0.07	-42.74	-1.00
220	2.44	-0.41	0.06	-42.82	-1.00
240	2.87	-0.39	0.19	-42.88	-1.00
260	3.36	-0.37	0.33	-42.88	-1.00

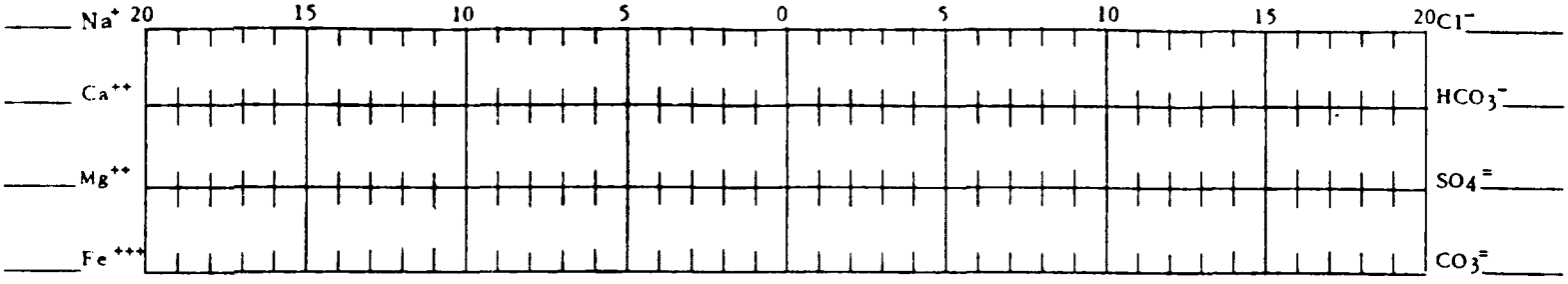
WATER ANALYSIS REPORT

NL Treating Chemicals/NL Industries, Inc.
P. O. Box 4305 Houston, Texas 77210

				SHEET NUMBER
COMPANY: Texaco Producing				DATE: 7/23/87
FIELD		COUNTY OR PARISH: Lea		STATE: N.M.
LEASE OR UNIT: Mexico F	WELL(S) NAME OR NO.: #3	WATER SOURCE (FORMATION)		
DEPTH, FT.	BHT, F	SAMPLE SOURCE: well head	TEMP, F	WATER, BBL/DAY / OIL, BBL/DAY / GAS, MMCF/DAY
DATE SAMPLED: 7/23/87	TYPE OF WATER: [X] PRODUCED [ ] SUPPLY [ ] WATERFLOOD [ ] SALT WATER DISPOSAL			

WATER ANALYSIS PATTERN

(NUMBER BESIDE ION SYMBOL INDICATES me/l* SCALE UNIT)



DISSOLVED SOLIDS

CATIONS	me/l*	mg/l*
Total Hardness	760	
Calcium, Ca^{++}	138	2760
Magnesium, Mg^{++}	22	268.4
Iron (Total) Fe^{+++}		0.4
Barium, Ba^{++}		
Sodium, Na^{+}(calc.)	1154.6	26555.8
ANIONS		
Chloride, Cl^{-}	1281.7	45500
Sulfate, $SO_4^{=}$	22.4	1075
Carbonate, $CO_3^{=}$		
Bicarbonate, HCO_3^{-}	9.4	573.4
Hydroxyl, OH^{-}		
Sulfide, $S^{=}$	1.1	17.9

DISSOLVED GASES

Hydrogen Sulfide, H_2S	mg/l*
Carbon Dioxide, CO_2	mg/l*
Oxygen, O_2	mg/l*

PHYSICAL PROPERTIES

pH	7.2
Eh (Redox Potential)	MV
Specific Gravity	
Turbidity, JTU Units	
Total Dissolved Solids (calc.)	76750 mg/l*
Stability Index @___F	
@___F	
$CaSO_4$ Solubility @___F	mg/l*
@___F	mg/l*
Max. $CaSO_4$ Possible (calc.)	mg/l*
Max. $BaSO_4$ Possible (calc.)	mg/l*
Residual Hydrocarbons	ppm(Vol/Vol)

SUSPENDED SOLIDS (QUALITATIVE) R - 0.13 @ 68°

Iron Sulfide ☐ Iron Oxide ☐ Calcium Carbonate ☐ Acid Insoluble ☐

REMARKS AND RECOMMENDATIONS:

Complete H_2O + 7c
Background Info.

*NOTE: me/l and mg/l are commonly used interchangeably for epm and ppm respectively. Where epm and ppm are used, corrections should be made for specific gravity.

BTC ENGINEER	DIST. NO.	ADDRESS	OFFICE PHONE	HOME PHONE
Mike Brown	821	PO Box 1697 Hobbs, N.M.	392-1518	
ANALYZED: Green	DATE: 7/24/87	DISTRIBUTION: ☐ CUSTOMER ☐ AREA OR ☐ DISTRICT OFFICE ☐ BTC ENGINEER OR ☐ BTC LAB ☐ BTC SALES SUPERVISOR		

NL INDUSTRIES, INC.

SCALING TENDENCIES OF WATERS

COMPANY: TEXACO PRODUCING
SAMPLE POINT: WINDMILL
LOCATION: MEXICO F
DATE: 7/23/87

WATER ANALYSIS (MG/L):

SODIUM	361.1
CALCIUM	68.0
MAGNESIUM	75.6
CHLORIDE	700.0
SULFATE	25.0
BICARBONATE	311.1
IRON	0.1
BARIUM	0.0
STRONTIUM	0.0
PH:	7.7
IONIC STRENGTH =	0.0304

INDEX VALUES GREATER THAN ZERO INDICATE SCALING CONDITIONS
INDEX VALUES OF ZERO OR LESS INDICATE A STABLE WATER

TEMP.	CALCITE INDEX	GYPSUM INDEX	ANHYDRITE INDEX	BARITE INDEX	STRONTIUM INDEX
60	0.18	-2.47	-2.72	-40.69	-1.00
80	0.30	-2.51	-2.65	-40.83	-1.00
100	0.41	-2.53	-2.58	-40.95	-1.00
120	0.53	-2.53	-2.49	-41.04	-1.00
140	0.65	-2.52	-2.40	-41.11	-1.00
160	0.78	-2.50	-2.29	-41.16	-1.00
180	0.92	-2.47	-2.16	-41.19	-1.00
200	1.06	-2.43	-2.03	-41.20	-1.00
220	1.22	-2.39	-1.88	-41.20	-1.00
240	1.38	-2.34	-1.73	-41.19	-1.00
260	1.55	-2.30	-1.56	-41.17	-1.00

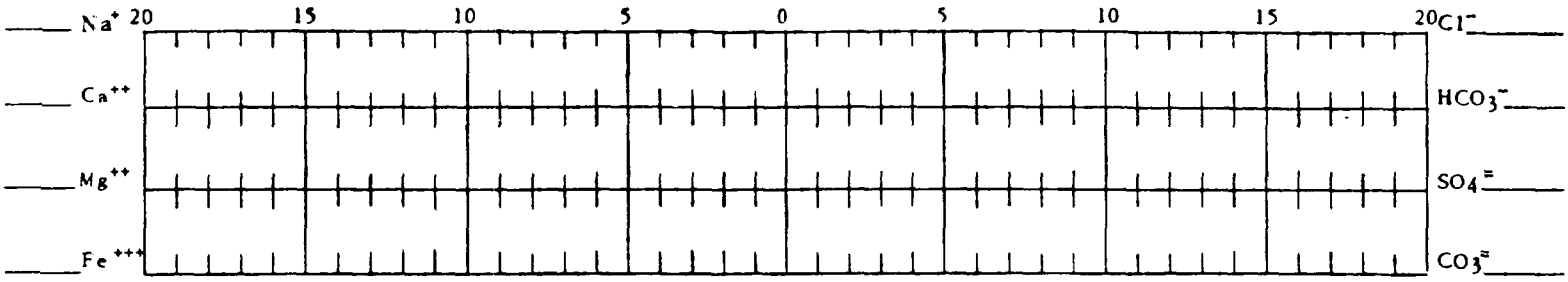
WATER ANALYSIS REPORT

NL Treating Chemicals /NL Industries, Inc.
P. O. Box 4305 Houston, Texas 77210

			SHEET NUMBER
COMPANY: Texaco Producing			DATE: 7/23/87
FIELD	COUNTY OR PARISH: Lea		STATE: N. M.
LEASE OR UNIT: Mexico F	WELL(S) NAME OR NO.: Windmill	WATER SOURCE (FORMATION)	
DEPTH, FT. / BHT, F	SAMPLE SOURCE / TEMP, F	WATER, BBL/DAY / OIL, BBL/DAY	GAS, MMCF/DAY
DATE SAMPLED: 7/23/87	TYPE OF WATER: ☐ PRODUCED ☐ SUPPLY ☐ WATERFLOOD ☐ SALT WATER DISPOSAL		

WATER ANALYSIS PATTERN

(NUMBER BESIDE ION SYMBOL INDICATES me/l* SCALE UNIT)



DISSOLVED SOLIDS

CATIONS	me/l*	mg/l*
Total Hardness	9.6	
Calcium, Ca^{++}	3.4	68
Magnesium, Mg^{++}	6.2	75.6
Iron (Total) Fe^{+++}		0.1
Barium, Ba^{++}		
Sodium, Na^{+}(calc.)	15.7	361.1
ANIONS		
Chloride, Cl^{-}	19.7	700
Sulfate, $SO_4^{=}$	.5	25
Carbonate, $CO_3^{=}$		
Bicarbonate, HCO_3^{-}	5.1	311.1
Hydroxyl, OH^{-}		
Sulfide, $S^{=}$	21	

DISSOLVED GASES

Hydrogen Sulfide, H_2S	_____ mg/l*
Carbon Dioxide, CO_2	_____ mg/l*
Oxygen, O_2	_____ mg/l*

PHYSICAL PROPERTIES

pH	7.7
Eh (Redox Potential)	_____ MV
Specific Gravity	_____
Turbidity, JTU Units	_____
Total Dissolved Solids (calc.)	1541 mg/l*
Stability Index @____F	_____
@____F	_____
$CaSO_4$ Solubility @____F	_____ mg/l*
@____F	_____ mg/l*
Max. $CaSO_4$ Possible (calc.)	_____ mg/l*
Max. $BaSO_4$ Possible (calc.)	_____ mg/l*
Residual Hydrocarbons	_____ ppm(Vol/Vol)

SUSPENDED SOLIDS (QUALITATIVE) R- 15.0 @ 64°

Iron Sulfide ☐ Iron Oxide ☐ Calcium Carbonate ☐ Acid Insoluble ☐

*NOTE: me/l and mg/l are commonly used interchangeably for epm and ppm respectively. Where epm and ppm are used, corrections should be made for specific gravity.

REMARKS AND RECOMMENDATIONS:

Complete H_2O + 7e

BTC ENGINEER: Mike Brown	DIST. NO.: 821	ADDRESS: P.O.Box 1697 Hobbs, N.M.	OFFICE PHONE: 392-1518	HOME PHONE
ANALYZED: LHS	DATE: 7/24/87	DISTRIBUTION ☐ CUSTOMER ☐ AREA OR ☐ DISTRICT OFFICE ☐ BTC ENGINEER OR ☐ BTC LAB ☐ BTC SALES SUPERVISOR		

AFFIDAVIT OF PUBLICATION

State of New Mexico,
County of Lea.

I,_____

Mark C. Keeling

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

August 24, 1987

and ending with the issue dated

August 24, 1987

Mark C. Keeling
Business Manager

Sworn and subscribed to before me this 25 day of August, 1987

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.

40 LEGAL NOTICE
AUGUST 24, 1987

Notice is hereby given of the application of Texaco Producing Inc., Attention: L. J. Seeman, District Petroleum Engineer, P. O. Box 728, Hobbs, New Mexico, 88240, Telephone (505) 393-7191, to the Oil Conservation Division, New Mexico Energy & Minerals Department, for approval of the following injection well(s) for the purpose of salt water disposal.

Well(s) No(s).: 4

Lease/Unit Name: Mexico "F"

Location: 660' FNL & 660' FWL, Unit Letter D, Section 2, T-15-S, R-37-E

Lea County, New Mexico

The injection formation is Devonian at a depth of 12,160 feet below the surface of the ground. Expected maximum injection rate is 1000 barrels per day, and expected maximum injection pressure is 100 pounds per square inch. Interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico, 87501, within fifteen (15) days of this publication.

STATE OF NEW MEXICO

ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

HOBBS DISTRICT OFFICE

9-15-87

GARREY CARRUTHERS
GOVERNOR

POST OFFICE BOX 1980
HOBBS, NEW MEXICO 88241-1980
(505) 393-6161

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

RE: Proposed:
MC_____
DHC_____
NSL_____
NSP_____
SWD X
WFX_____
PMX_____

Gentlemen:

I have examined the application for the:

Levaco Inc. Mexico J #4-E 2-15-37
Operator Lease & Well No. Unit S-T-R

and my recommendations are as follows:

ok JS

Yours very truly,

Jerry Sexton
Supervisor, District 1

/ed