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 EXHIBIT #1
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: CONOCO INC.

Address: P.O. Box 460, Hobbs, NM 88240

Contact party: H. A. Ingram Phone: (505) 393-4141

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. EXHIBIT #2

* 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. EXHIBIT #3 & #4 thru #7

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected; EXHIBIT #8
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 EXH. #9 thru #16
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. EXHIBIT #17

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.) EXHIBITS #18 & #19

* 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. EXHIBIT #20

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: D. W. Johnson Title Division Manager

Signature: D. W. Johnson Date: 3-12-84

* 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.

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION
EXHIBIT NO. 1
CASE NO. 8527
Submitted by CONOCO INC.
Hearing Date March 13, 1985

EXHIBIT #3

OFFSET WELL DATA
MARSHALL WELL NO.'s 1 & 2

DATE DRILLED	WELL NAME & NO.	OPERATOR	LOCATION	FORMATION	TYPE	DEPTH	CASING SIZE	CASING DEPTH	CEMENT	PERFS (Ft.)	TREATMENT
3-31-79	Brinninstool Unit #3	Conoco	660' FSL & 1980' FEL Sec. 19, T23S, R33E	Devonian	P&A	15,785'	16" 10-3/4" 7-5/8" 5"liner	700' 5107' 12,510' 12,353-15,758'	675 sx 3740 sx 1800 sx 500 sx	15,108-15,684	
11-30-61	Marshall #3	Conoco	660' FSL & 1910' FWL Sec. 19, T23S, R33E	Ramsey	P&A	5324'	7-5/8"	371'	200 sx	--	--
12-26-61	Marshall #4	Conoco	1980' FSL & 625' FWL Sec. 19, T23S, R33E	Ramsey	P&A	5230'	7-5/8" 4-1/2"	367' 5230'	200 sx 200 sx	5088-90' 5095-98'	-- --
4-15-75	Marshall #5	Conoco	1980' FNL & 1980' FWL Sec. 19, T23S, R33E	Ramsey	Oil	5180'	8-5/8" 5-1/2"	527' 5180'	260 sx 300 sx	5090,94 5100,04, 08,12,16, 5120,22,& 5126'	--
11-13-75	Marshall #6	Conoco	990' FNL & 1980' FEL Sec. 19, T23S, R33E	Ramsey	Oil	5245'	8-5/8" 5-1/2"	1245' 5245'	650 sx 300 sx	5110-15' 5120'26'	-- --
12-26-75	Marshall #7	Conoco	990' FNL & 1980' FWL Sec. 19, T23S, R33E	Ramsey	Oil	5235'	8-5/8" 5-1/2"	1287' 5235'	700 sx 300 sx	5100-04' 5107-23'	Frac 10,000 gals. oil & 27,000# sd.
9-17-77	Marshall #8	Conoco	2600' FSL & 1230' FWL Sec. 19, T23S, R33E	Ramsey	Oil	5303'	8-5/8" 5-1/2"	1225' 5303'	655 sx 1250 sx	5078,80, 82,84,86, 88,5106, 5108'	Acid w/1000 gals & Frac w/9000 gals oil & 20,000# sd.
10-21-61	Fields #1	Conoco	660' FSL & 660' FEL Sec. 24, T23S, R33E	Ramsey	Oil	5217'	8-5/8" 5-1/2"	386' 5217'	200 sx 150 sx	5111-14' 5117' sqzd w/ 100 sx	Acidized w/500 gals & Frac w/2000 gals oil & 3000# sd.
4-15-63	Fields #1	Hugh L. Johnston	1650' FSL & 330' FEL Sec. 24, T23S, R32E	Ramsey	P&A	5168'	8-5/8" 4-1/2"	386' 5168'	200 sx 100 sx	5101-05'	Frac w/4200 gals & 1000# sd.
10-10-76	Fields #4	Conoco	660' FNL & 330' FEL Sec. 25, T23S, R33E	Ramsey	Oil	5250'	9-5/8" 5-1/2"	1290' 5250'	525 sx 300 sx	5091-5100 5104-5120 5124-5128	--

EXHIBIT #3

EXHIBIT #4

WELL NAME : Marshall No. 3

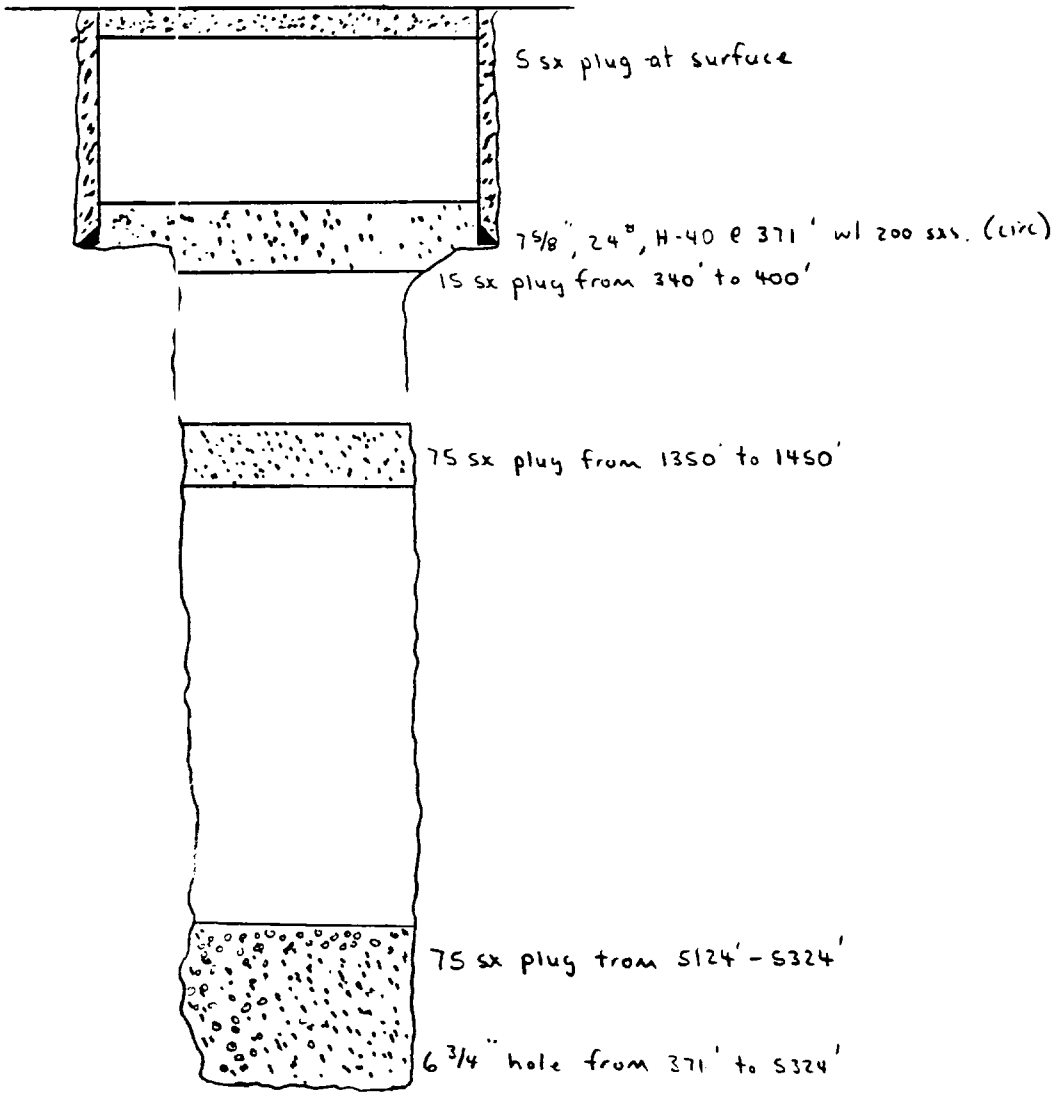
Plugged + Abondoned

Elev: 3698' GL

KB: 12' AGL

Location : 660 FSL + 1910 FWL

Section 19, T23S, R33E



TD: 5324'

PBTD: 5324'

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION

EXHIBIT NO. 4

CASE NO. 8527

Submitted by CONOCO INC.

Hearing Date March 13, 1985

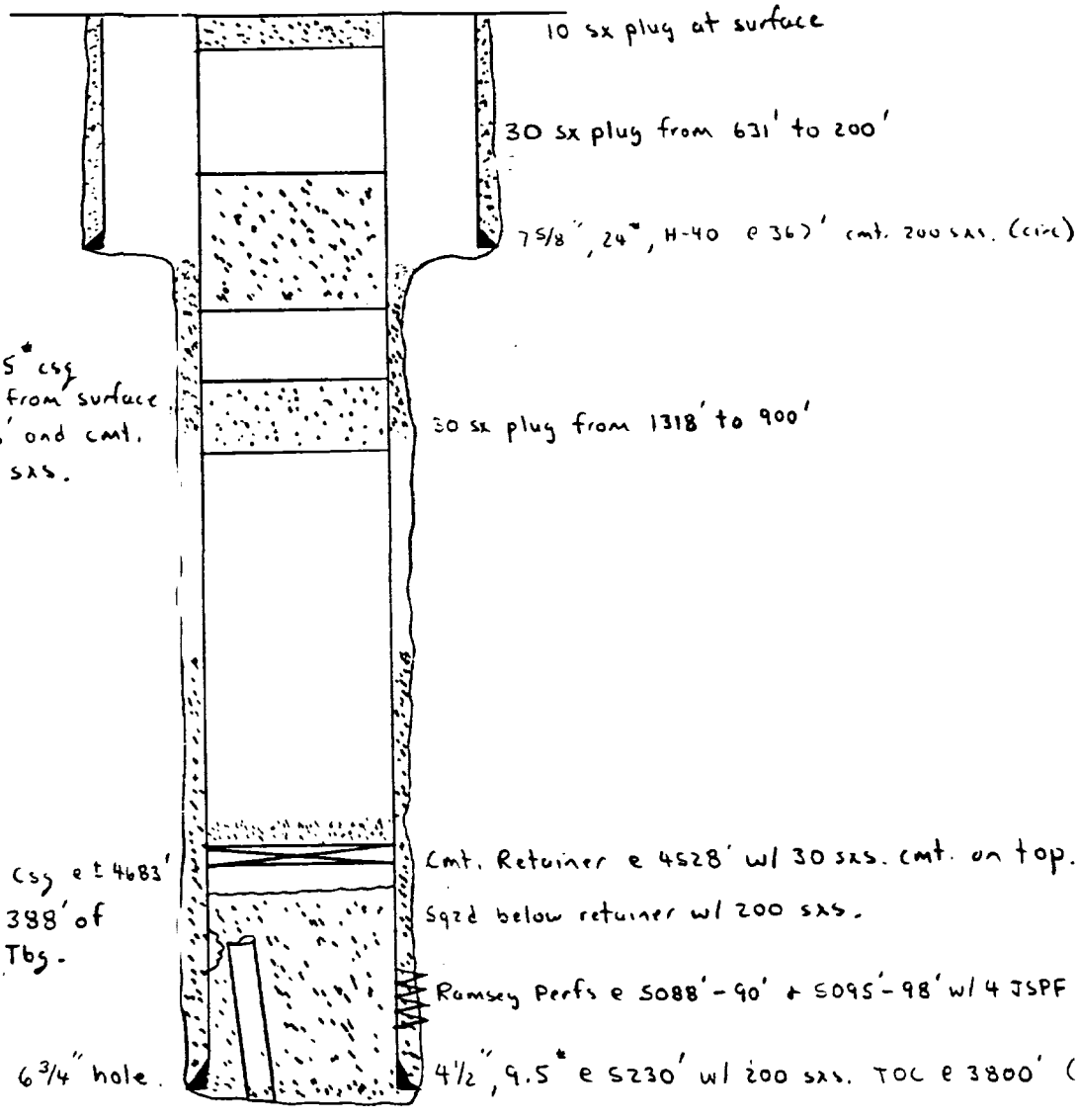
EXHIBIT #5

WELL NAME : Marshall No. 4

Plugged & Abandoned

Elev: 3701' GL
KB: 13' AGL

Location : 1980 FSL & 625' FWL
Section 19, T23S, R33E



TD: 5230'

PBTD: 5230'

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION
EXHIBIT NO. 5
CASE NO. 8527
Submitted by CONOCO INC.
Hearing Date March 13, 1985

EXHIBIT #6

WELL NAME : Brinninstool Unit No. 3

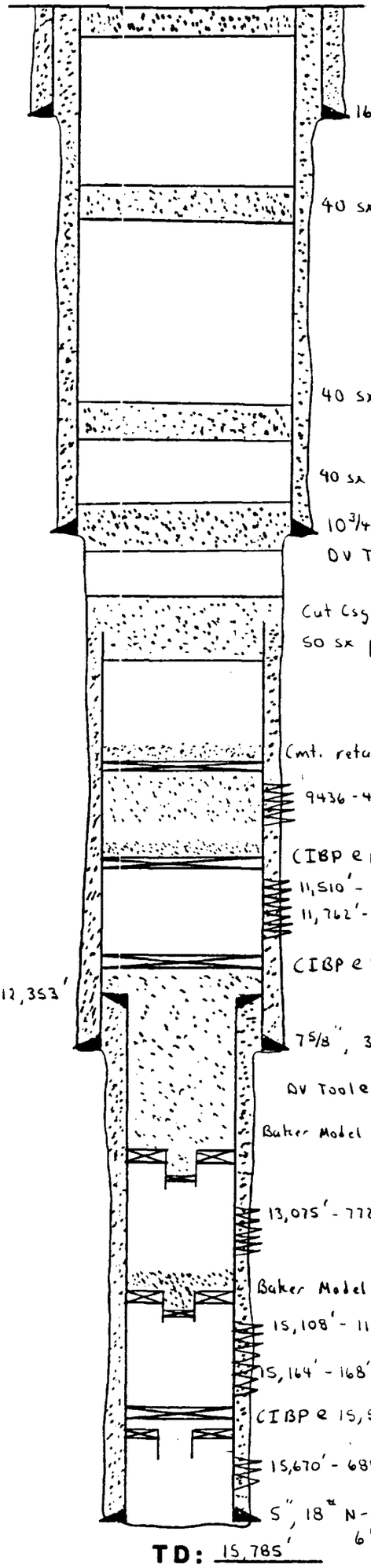
Current Status: Plugged & Abandoned

Elev. : 3692' GL

KB: 20' AGL

Location : 660 FSL & 1980 FEL

Sec 19, T23S, R33E



TD: 15,785'

PBTD: _____

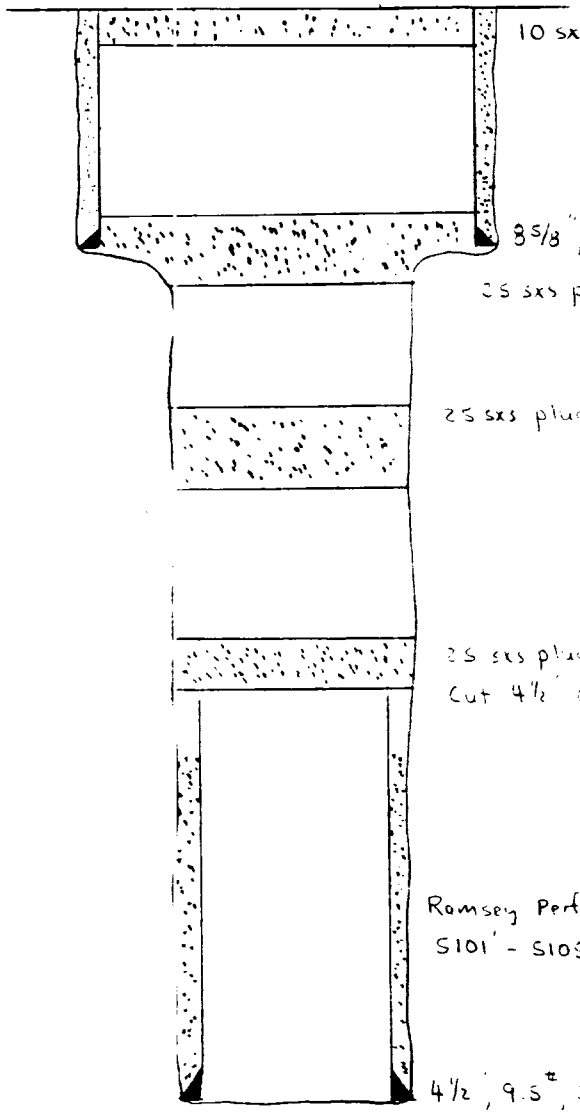
EXHIBIT #7

WELL NAME : Fields Federal No. 1

Elev: 3719'

KB: _____

Location : 1650 FSL & 330 FEL
Sec 24, T23S, R32E



TD: 5168'

PBTD: 5163'

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION
EXHIBIT NO. 7
CASE NO. 8527
Submitted by CONOCO INC.
Hearing Date March 13, 1985

EXHIBIT #8

INJECTION RATE - VOLUME - PRESSURE
MARSHALL WELL NO. 2 - SWD

Proposed Average Daily Rate Injection:	21 BWPH
Proposed Maximum Daily Rate Injection:	24 BWPH
Proposed Average Daily Volume Injection:	500 BWPD
Proposed Maximum Daily Rate Injection:	560 BWPD
Open or Closed System:	Closed
Proposed Average Injection Pressure:	400 psi
Proposed Maximum Injection Pressure:	1021 psi

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION
EXHIBIT NO. 8
CASE NO. 8527
Submitted by CONOCO INC.
Hearing Date March 13, 1985

EXHIBIT #9

conoco

HOBBS PRODUCTION DIVISION
WATER ANALYSIS REPORT FORM

LABORATORY United Chemical Corporation

FIELD Delaware **LEASE** Marshall **WELL NO.** 2

DATE SAMPLED 11-6-75 **DATE ANALYZED** 11-7-75

	meq/L	mg/L
CATIONS		
CALCIUM (Ca^{++})	1,336.00	26,720
MAGNESIUM (Mg^{++})	328.20	3,938
SODIUM (Na^{+})	2,777.78	63,861
ANIONS		
BICARBONATE (HCO_3^{-})	2.30	140
SULFATE ($SO_4^{=}$)	12.28	590
CHLORIDE (Cl^{-})	4,427.40	157,000
Total Dissolved Solids		252,249

OTHERS

pH 5.7 **SP GR** 1.165

TEMP 30 °C **SUSP SOLIDS**

SCALING INDEX **(CIRCLE ONE)**

CALCIUM CARBONATE (POSITIVE) NEGATIVE

CALCIUM SULFATE (POSITIVE) NEGATIVE

cc: Dave Edmonds
L. A. Carrell
Stan Smith

Lucille Little
SIGNATURE ANALYST

RFM 3-74

EXHIBIT #10

SS file

conoco

HOBBS PRODUCTION DIVISION
WATER ANALYSIS REPORT FORM

LABORATORY United Chemical Corporation

FIELD Delaware (Cruz) LEASE Marshall WELL NO. 1

DATE SAMPLED 1-24-75 DATE ANALYZED 1-24-75

	meq/L	mg/L
CATIONS		
CALCIUM (Ca^{++})	1,240.00	24,800
MAGNESIUM (Mg^{++})	328.00	3,936
SODIUM (Na^{+})	2,730.35	62,771
Fe		27
ANIONS		
BICARBONATE (HCO_3^{-})	0.64	39
SULFATE ($SO_4^{=}$)	11.31	543
CHLORIDE (Cl^{-})	4,286.40	152,000
TDS		244,116.

OTHERS

pH 6.3 SP GR 1.165

TEMP 30 °C SUSP SOLIDS

SCALING INDEX (CIRCLE ONE)

CALCIUM CARBONATE (POSITIVE) NEGATIVE

CALCIUM SULFATE (POSITIVE) NEGATIVE

cc: Mr. John Tonso
Mr. Dave Edmonds

Lucille Little Lucille Little

SIGNATURE ANALYST

EXHIBIT #11

UNICHEM INTERNATIONAL

601 NORTH LEECH P.O.BOX1499

HOBBS, NEW MEXICO 88240

COMPANY : CONOCO
DATE : 02/19/85
FIELD,LEASE&WELL : MARSHALL
SAMPLING POINT: WELL #5
DATE SAMPLED : 02/13/85

SPECIFIC GRAVITY = 1.171
TOTAL DISSOLVED SOLIDS = 252503
RESISTIVITY AT 77F IS .044 OHMS
PH = 6.29

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	1253.	25116.
MAGNESIUM	(MG)+2	246.	2998.
SODIUM	(NA),CALC.	2909.	66899.
ANIONS			
BICARBONATE	(HCO3)-1	.8	48.8
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	9.1	440
CHLORIDES	(CL)-1	4400	157000
DISSOLVED CASES			
CARBON DIOXIDE	(CO2)	3.4	149.
HYDROGEN SULFIDE	(H2S)	0	0
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		19.1
BARIUM	(BA)+2	0	0
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) =6.141

SCALING INDEX	TEMP 30C 86F	48.8C 120F
CARBONATE INDEX	1.14	1.99
CALCIUM CARBONATE SCALING	LIKELY	LIKELY
CALCIUM SULFATE INDEX	1.81	1.90
CALCIUM SULFATE SCALING	LIKELY	LIKELY

IONIC STRENGTH IS TOO HIGH FOR SULFATE METHOD
IONIC STRENGTH IS TOO HIGH FOR CARBONATE METHOD

EXHIBIT #12

UNICHEM INTERNATIONAL

601 NORTH LEECH P.O.BOX1499

HOBBS, NEW MEXICO 88240

COMPANY : CONOCO
DATE : 02/19/85
FIELD,LEASE&WELL : MARSHALL
SAMPLING POINT: WELL #6
DATE SAMPLED : 02/13/85

SPECIFIC GRAVITY = 1.171
TOTAL DISSOLVED SOLIDS = 252379
RESISTIVITY AT 77F IS .044 OHMS
PH = 6.34

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	1233.	24716
MAGNESIUM	(MG)+2	266.	3241.
SODIUM	(NA).CALC.	2910.	66908.
ANIONS			
BICARBONATE	(HCO3)-1	1.2	73.2
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	9.1	440
CHLORIDES	(CL)-1	4400	157000
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	3.6	159.
HYDROGEN SULFIDE	(H2S)	0	0
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		50.7
BARIUM	(BA)+2	0	0
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) =6.14

SCALING INDEX	TEMP 30C 86F	48.8C 120F
CARBONATE INDEX	1.36	2.21
CALCIUM CARBONATE SCALING	LIKELY	LIKELY
CALCIUM SULFATE INDEX	1.70	1.78
CALCIUM SULFATE SCALING	LIKELY	LIKELY

IONIC STRENGTH IS TOO HIGH FOR SULFATE METHOD
IONIC STRENGTH IS TOO HIGH FOR CARBONATE METHOD

EXHIBIT #13

UNICHEM INTERNATIONAL

601 NORTH LEECH P.O.BOX1499

HOBBS. NEW MEXICO 88240

COMPANY : CONOCO INC.
DATE : 02/19/85
FIELD.LEASE&WELL : MARSHALL
SAMPLING POINT: WELL #7
DATE SAMPLED : 02/13/85

SPECIFIC GRAVITY = 1.171
TOTAL DISSOLVED SOLIDS = 232454
RESISTIVITY AT 77F IS .044 OHMS
PH = 6.37

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	1240	24849.
MAGNESIUM	(MG)+2	260	3160.
SODIUM	(NA).CALC.	2910.	66915.
ANIONS			
BICARBONATE	(HCO3)-1	1.2	73.2
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	9.4	455
CHLORIDES	(CL)-1	4400	157000
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	3.4	149.
HYDROGEN SULFIDE	(H2S)	0	0
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		26
BARIUM	(BA)+2	0	0
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) =6.14200001

SCALING INDEX	TEMP 30C 86F	48.8C 120F
CARBONATE INDEX	1.40	2.24
CALCIUM CARBONATE SCALING	LIKELY	LIKELY
CALCIUM SULFATE INDEX	2.05	2.13
CALCIUM SULFATE SCALING	LIKELY	LIKELY

IONIC STRENGTH IS TOO HIGH FOR SULFATE METHOD
IONIC STRENGTH IS TOO HIGH FOR CARBONATE METHOD

EXHIBIT #14

UNICHEM INTERNATIONAL

601 NORTH LEECH P.O.BOX1499

HOBBS, NEW MEXICO 88240

COMPANY : CONOCO INC.
DATE : 02/19/85
FIELD,LEASE&WELL : MARSHALL
SAMPLING POINT: WELL #8
DATE SAMPLED : 02/13/85

SPECIFIC GRAVITY = 1.171
TOTAL DISSOLVED SOLIDS = 252548
RESISTIVITY AT 77F IS .045 OHMS
PH = 4.42

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	1233.	24716
MAGNESIUM	(MG)+2	246.	2998.
SODIUM	(NA).CALC.	2929.	67354.
ANIONS			
BICARBONATE	(HCO3)-1	.8	48.8
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	8.9	430
CHLORIDES	(CL)-1	4400	157000
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	3.1	139.
HYDROGEN SULFIDE	(H2S)	0	0
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		15.8
BARIUM	(BA)+2	0	.4
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) =6.13

SCALING INDEX	TEMP 30C 86F	48.8C 120F
CARBONATE INDEX	1.26	2.10
CALCIUM CARBONATE SCALING	LIKELY	LIKELY
CALCIUM SULFATE INDEX	1.47	1.56
CALCIUM SULFATE SCALING	LIKELY	LIKELY

IONIC STRENGTH IS TOO HIGH FOR SULFATE METHOD
IONIC STRENGTH IS TOO HIGH FOR CARBONATE METHOD

EXHIBIT #15

UNICHEM INTERNATIONAL

601 NORTH LEECH P.O.BOX1499

HOBBS. NEW MEXICO 88240

COMPANY : CONOCO
DATE : 11-1-84
FIELD,LEASE&WELL : FIELDS WELL ~~#3~~ #1
SAMPLING POINT:
DATE SAMPLED : 10-30-84

SPECIFIC GRAVITY = 1.178
TOTAL DISSOLVED SOLIDS = 250589
PH = 6.26

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	1240	24849.
MAGNESIUM	(MG)+2	260	3172
SODIUM	(NA).CALC.	2912.	66956.
ANIONS			
BICARBONATE	(HCO3)-1	1	61.0
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	11.4	550
CHLORIDES	(CL)-1	4400	155000
DISSOLVED CASES			
CARBON DIOXIDE	(CO2)	4.5	199.
HYDROGEN SULFIDE	(H2S)	0	0
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		36
BARIUM	(BA)+2	0	.03
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) =5.984

Rw: 0.047 @ 78°

SCALING INDEX	TEMP 30C 86F	48.8C 120F
CARBONATE INDEX	-160	-404
CALCIUM CARBONATE SCALING	UNLIKELY	UNLIKELY
CALCIUM SULFATE Kc=	2.72E-03	2.57E-03
CALCIUM SULFATE IP=	3.92E-03	3.91E-03
CASO4 SCALING	LIKELY	LIKELY
BARIUM SULFATE Kc=	3.91E-08	5.58E-08
BARIUM SULFATE IP=	1.38E-09	1.37E-09
BASO4 SCALING	UNLIKELY	UNLIKELY

IONIC STRENGTH IS TOO HIGH FOR SULFATE METHOD
IONIC STRENGTH IS TOO HIGH FOR CARBONATE METHOD

EXHIBIT #16

UNICHEM INTERNATIONAL

601 NORTH LEECH P.O.BOX1499

HOBBS. NEW MEXICO 88240

COMPANY : CONOCO
DATE : 11-1-84
FIELD.LEASE&WELL : FIELD LETTER A WELL#4
SAMPLING POINT:
DATE SAMPLED : 10-30-84

SPECIFIC GRAVITY = 1.203
TOTAL DISSOLVED SOLIDS = ~~284750~~ 281297
PH = 6.37

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	1280	25651.
MAGNESIUM	(MG)+2		3904
SODIUM	(NA).CALC.	3632	~~83497~~ 76142
ANIONS			
BICARBONATE	(HCO3)-1	1.8	109.
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	10.2	490
CHLORIDES	(CL)-1	4900	175000
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	7.4	329.
HYDROGEN SULFIDE	(H2S)	0	0
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		147
BARIUM	(BA)+2	0	.11
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) =6.613

Rw 0.045 @ 78°

SCALING INDEX	TEMP 30C 86F	48.8C 120F
CARBONATE INDEX	-454	-120
CALCIUM CARBONATE SCALING	UNLIKELY	UNLIKELY
CALCIUM SULFATE Ksp=	2.42E-03	2.22E-03
CALCIUM SULFATE IP=	3.87E-03	3.87E-03
CASO4 SCALING	LIKELY	LIKELY
BARIUM SULFATE Ksp=	4.24E-08	6.06E-08
BARIUM SULFATE IP=	4.84E-09	4.84E-09
BASO4 SCALING	UNLIKELY	UNLIKELY

IONIC STRENGTH IS TOO HIGH FOR SULFATE METHOD
IONIC STRENGTH IS TOO HIGH FOR CARBONATE METHOD

EXHIBIT #17

CONOCO INC.
GEOLOGICAL DATA
CRUZ DELAWARE POOL

The injection zone is the Ramsey sand member of the Bell Canyon Series in the Upper Delaware Mountain Group. The Bell Canyon consists of two major lithologic types; siltstone and very fine grained sandstone. The Ramsey sand is a gray, fine-grained, relatively clean, massive, friable sand.

The Ramsey SS (injection zone) is approximately 87' thick. The top is a depth of 5095' (-1392') and is a porous siltstone which grades into a clean sandstone. The base is at 5082' (-1479').

The upper formations are Rustler Anhydrite 1222'/+2481', Salado Salt top 1370'/+2333' - base 4782'/-1079', Castile Anhydrite top 4782'/-1079' - base 5033'/-1330', Lamar L.S. top 5033'/-1330' - base 5095'/-1392.

There is no fresh water aquifer above the Rustler Anhydrite but isolated sand lenses in the Pleistocene surface red beds located from 400'-600' below the surface are present in the area. However they present no apparent problem with Conoco's planned salt water injection.

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION
EXHIBIT NO. 17
CASE NO. 8527
Submitted by CONOCO INC.
Hearing Date March 13, 1985

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION

EXHIBIT NO. 16

CASE NO. 8527

Submitted by: CONOCO INC.

Hearing Date: March 13, 1985

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION

EXHIBIT NO. 15

CASE NO. 8527

Submitted by CONOCO INC.

Hearing Date March 13, 1985

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION
EXHIBIT NO. 14
CASE NO. 8527
Submitted by CONOCO INC.
Hearing Date March 13, 1985

BEFORE EXAMINER **QUINTANA**
OIL CONSERVATION DIVISION

EXHIBIT NO. 13

CASE NO. 8527

Submitted by CONOCO INC.

Hearing Date March 13, 1985

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION

EXHIBIT NO. 12

CASE NO. 8527

Submitted by CONOCO INC.

Hearing Date March 13, 1985

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION

EXHIBIT NO. 11

CASE NO. 8527

Submitted by CONOCO INC.

Hearing Date March 13, 1985

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION

EXHIBIT NO. 10

CASE NO. 8527

Submitted by CONOCO INC.

Hearing Date March 13, 1985

BEFORE EXAMINER
OIL CONSERVATION DIVISION

EXHIBIT NO. 9

CASE NO. 8527

Submitted by: CONOCO INC.

Hearing Date: March 13, 1985

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION

EXHIBIT NO. 6

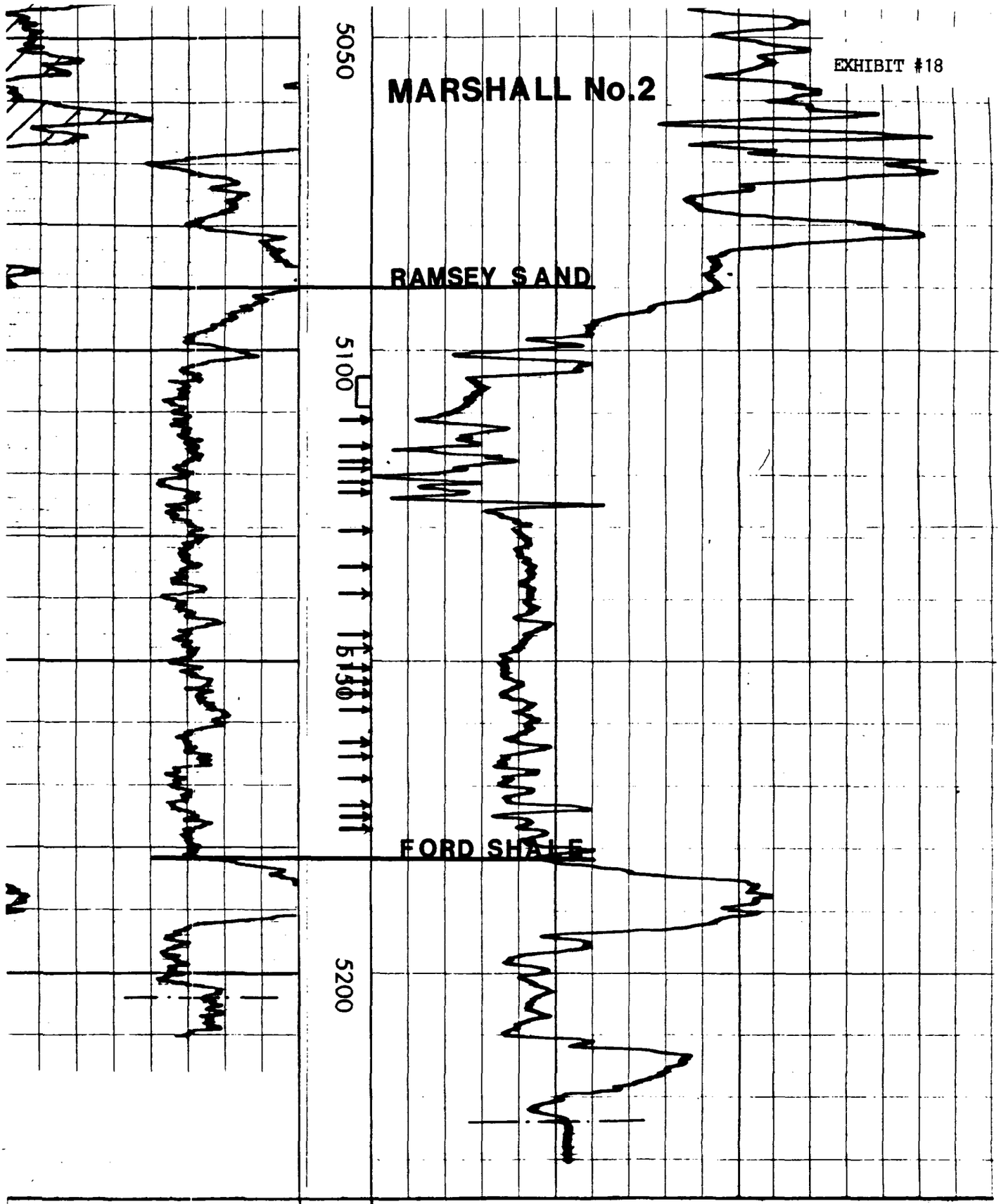
CASE NO. 8527

Submitted by CONOCO INC.

Hearing Date March 13, 1985

EXHIBIT #18

MARSHALL No.2



Formation Amplitude —·—·—·—
3' Spacing----------

100 1'Spacing 160

0 API Units 80

80 ////////////// 160

GAMMA RAY

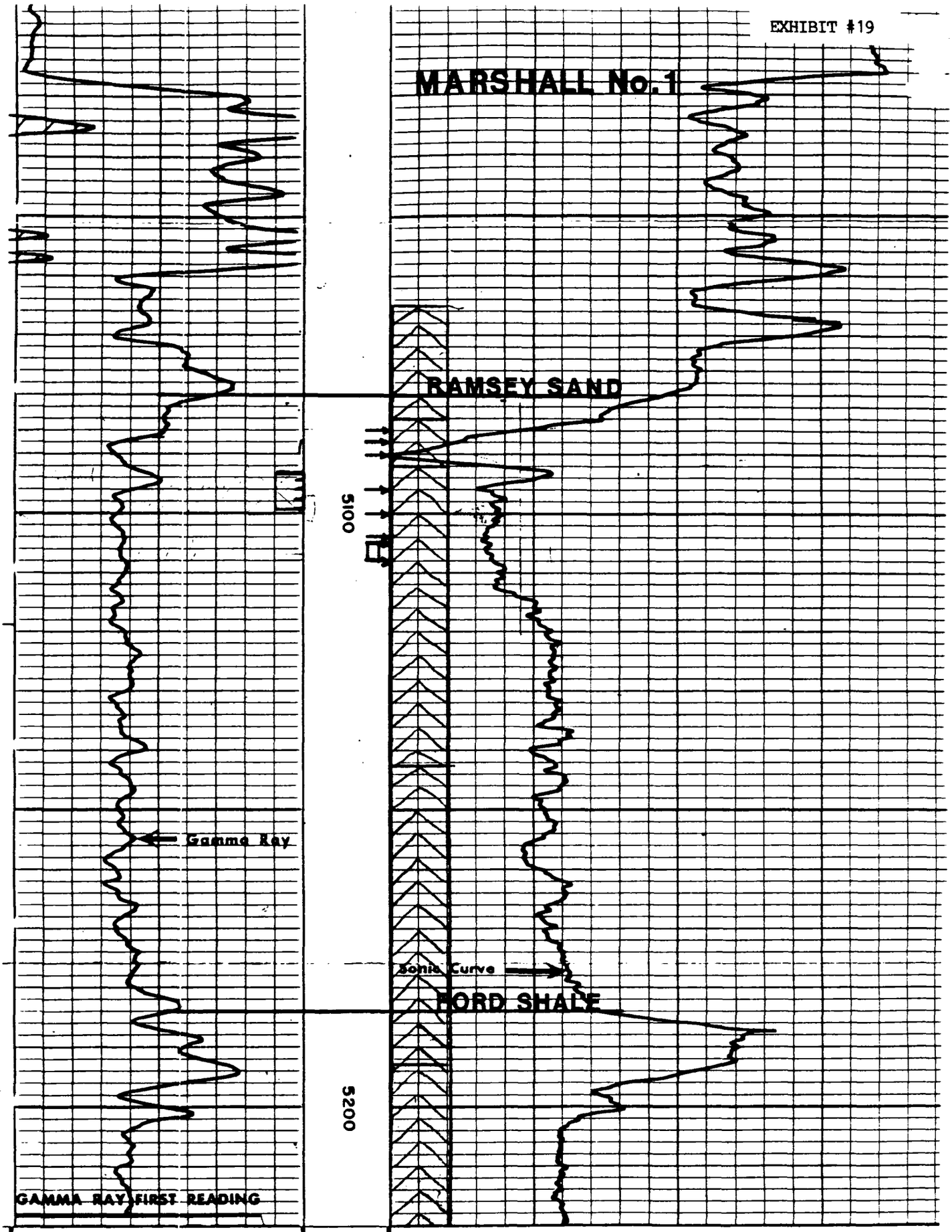
TIME
MICROSECONDS PER FT.

Continental Oil Company
Marshall # 19-2
Cruz (Delaware) Field
Lea County, New Mexico

T.D. LOGGED	5224
T.D. DRILLER	5216
T.D. WELEX	5228

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION
EXHIBIT NO. 18
CASE NO. 8527
Submitted by CONOCO INC.
Hearing Date March 13, 1985

EXHIBIT #19



GAMMA RAY

– ↔ +

SPONTANEOUS-POTENTIAL
millivolts

DEPTHS

100 70

INTERVAL TRANSIT TIME
microseconds per foot
← increases

T 3 R 1 3 R

COMPANY CONTINENTAL OIL COMPANY

WELL I J MARSHAL 19-1

FIELD WILDCAT

STATE NEW MEXICO

Rm .045 @ 93 F
Rmf .042 @ 75 F
Rmc @ F
BHT F

SWSC FR 5239
SWSC TD 5246
DRLR TD 5237
Elev:
KB 3720
DF 3719
GL 3707

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION

EXHIBIT NO. 19

CASE NO. 8527

Submitted by CONOCO INC.

Hearing Date March 13, 1985

EXHIBIT #20

UNICHEM INTERNATIONAL

601 NORTH LEECH P.O.BOX1499

HOBBS, NEW MEXICO 88240

COMPANY : CONOCO INC.
DATE : 02/19/85
FIELD,LEASE&WELL . MARSHALL
SAMPLING POINT: FRESH WATER WELL
DATE SAMPLED : 02/13/85

SPECIFIC GRAVITY = 1
TOTAL DISSOLVED SOLIDS = 914
RESISTIVITY AT 77F IS 5.11 OHMS
PH = 8.34

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	1.5	30.0
MAGNESIUM	(MG)+2	4.6	56.2
SODIUM	(NA).CALC.	9.1	210.
ANIONS			
BICARBONATE	(HCO3)-1	2.2	134.
CARBONATE	(CO3)-2	1	30
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	2.0	100
CHLORIDES	(CL)-1	10	353
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	0	0
HYDROGEN SULFIDE	(H2S)	0	0
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		2.7
BARIUM	(BA)+2	0	.1
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) =.02

SCALING INDEX	TEMP 30C 86F	48.8C 120F
CARBONATE INDEX	1.82	2.22
CALCIUM CARBONATE SCALING	LIKELY	LIKELY
CALCIUM SULFATE INDEX	-18.	-18.
CALCIUM SULFATE SCALING	UNLIKELY	UNLIKELY

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION
EXHIBIT NO. 20
CASE NO. 8527
Submitted by CONOCO INC.
Hearing Date March 13, 1985

EXHIBIT #21

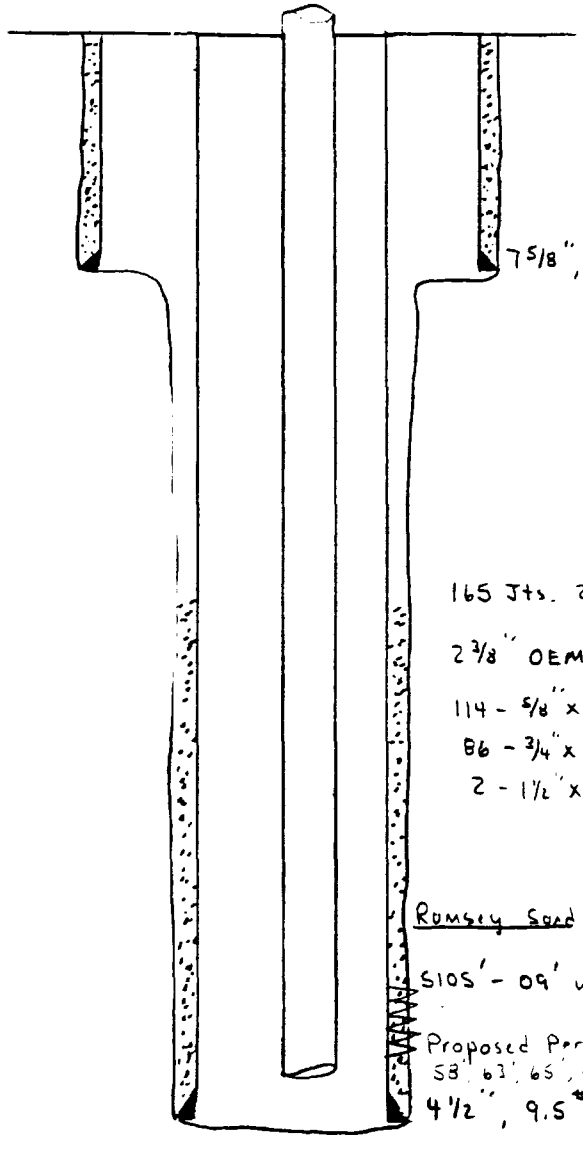
WELL NAME : Marshall No. 2

Elev: 3690' GL

KB: 13' AGL

Location : 1980 FSL & 1910' FWL

Sec 19, T23S, R33E



7 5/8", 24#, H-40 & N-80 @ ± 380' w/ 200 sx. (circ.)

165 Jts. 2 3/8" 8rd + 10rd tbg and 1 Jt.

2 3/8" OEMA @ ± 5140' and S.N. @ ± 5110'

114 - 5/8" x 25' rods

86 - 3/4" x 25' rods

2 - 1½" x 25' K-bars

Ramsey Sand

5105' - 09' w/ 4 JSPF

Proposed Perfs: 5111', 15', 18', 9', 21', 23', 29', 35', 39', 46', 48', 51', 55', 58', 63', 65', 69', 73', 75', 77' (Total - 20 Perfs)

4½", 9.5#, J-55 @ ± 5216' w/ 150 sx TOC @ ± 4408 (Temp Survey)

TD: 5216'

PBTD: 5216'

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION

EXHIBIT NO. 21

CASE NO. 8527

Submitted by CONOCO INC.

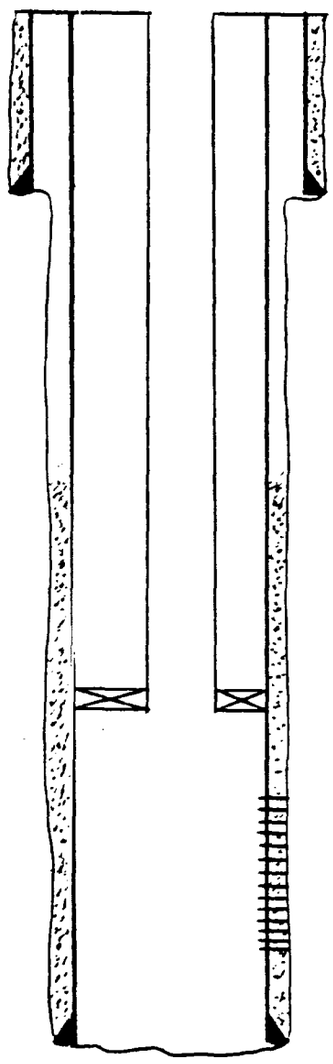
Hearing Date March 13, 1985

EXHIBIT #22

INJECTION WELL DATA SHEET

OPERATOR	LEASE			
CONOCO	Marshall			
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE
2				

Schematic



Tabular Data

Surface Casing

Size 7-5/8" Cemented with 200 sx.

TOC Surface feet determined by circulation

Hole size _____

Intermediate Casing

Size _____" Cemented with _____ sx.

TOC _____ feet determined by _____

Hole size _____

Long string

Size 4-1/2" Cemented with 150 sx.

TOC 4408 feet determined by Temp Survey

Hole size 6-3/4"

Total depth 5216'

Injection interval

5105 feet to 5180 feet

(perforated or open-hole, indicate which)

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

Guiberson Uni-1 (brand and model) packer at 5025 feet

(or describe any other casing-tubing seal).

Other Data

1. Name of the injection formation Ramsey Sand

2. Name of Field or Pool (if applicable) Cruz - Delaware

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) No

5. Give the depth to and name of any overlying and/or underlying oil or gas zones (pools) in this area. No overlying oil or gas zones. No immediate underlying oil or gas zones.

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION

EXHIBIT NO. 22

CASE NO. 8527

Submitted by CONOCO INC.

Hearing Date March 13, 1985

EXHIBIT #23

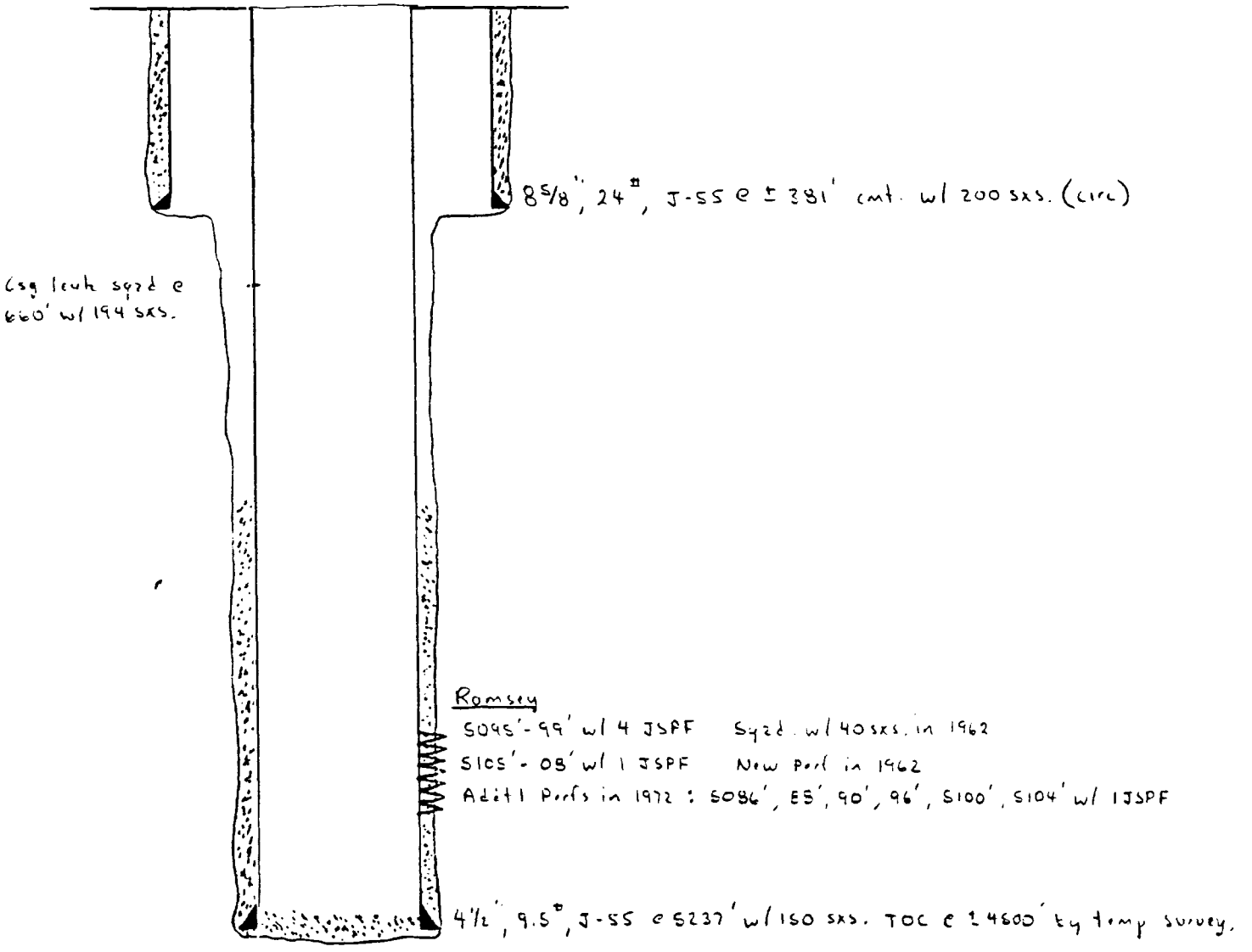
WELL NAME : Marshall No.1

Elev: 3707'

KB: 12' AGL

Location : Sec 19 T23S R33E

660 FSL & FWL



TD: 5237'

PBTD: _____

Current Status : Shut-in

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION

EXHIBIT NO. 23

CASE NO. 8527

Submitted by CONOCO INC.

Hearing Date March 13, 1985

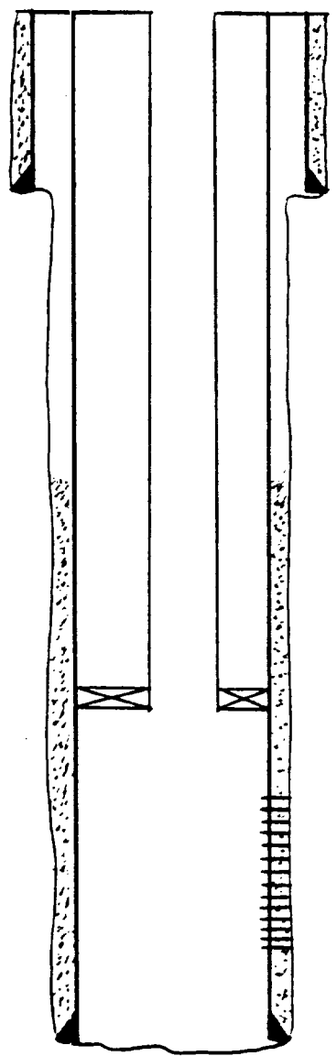
EXHIBIT #24

INJECTION WELL DATA SHEET

Conoco	Marshall			
OPERATOR	LEASE			
1	660' FSL & 660' FWL	19	23S	33E
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE

Lea County, New Mexico

Schematic



Tabular Data

Surface Casing

Size 8-5/8" Cemented with 200 sx.

TOC Surface feet determined by circulation

Hole size _____

Intermediate Casing

Size _____" Cemented with _____ sx.

TOC _____ feet determined by _____

Hole size _____

Long string

Size 4-1/2" Cemented with 150 sx.

TOC 4500 feet determined by Temp Survey

Hole size 6-3/4"

Total depth 5237'

Injection interval

5086' feet to 5180 feet

(perforated or open-hole, indicate which)

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

Guiberscn Uni-1 (brand and model) packer at 5000 feet

(or describe any other casing-tubing seal).

Other Data

1. Name of the injection formation Ramsey Sand

2. Name of Field or Pool (if applicable) Cruz - Delaware Pool

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) No

5. Give the depth to and name of any overlying and/or underlying oil or gas zones (pools) in this area. No overlying oil or gas zone. No immediate underlying oil or gas zones.

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION
EXHIBIT NO. 24
CASE NO. 8527
SUBMITTED BY CONOCO INC.
HEARING DATE March 13, 1985

PS Form 3811, July 1983

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☒ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:
Bureau of Land Management
ATTN: Area Manager
Carlsbad Resource Area
P.O. Box 1778
Carlsbad, NM 88220

4. Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Article Number: P335779406

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X Cathy Duran

6. Signature – Agent
X

7. Date of Delivery

8. Addressee's Address *(ONLY if requested and fee paid)*

DOMESTIC RETURN RECEIPT

PS Form 3811, July 1983

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☒ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:
Mr. W. H. Brinninstrool
Drawer A
Jal, NM 88252

4. Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Article Number: P335779405

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X Linda Arnett

6. Signature – Agent
X

7. Date of Delivery

8. Addressee's Address *(ONLY if requested and fee paid)*

DOMESTIC RETURN RECEIPT

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION
EXHIBIT NO. 25
CASE NO. 8527
Submitted by CONOCO INC.
Hearing Date March 13, 1985

EXHIBIT #26

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

February 17, 1985

and ending with the issue dated

February 17, 1985

Robert L Summers
Publisher.

Sworn and subscribed to before me this 18 day of February, 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.

32

LEGAL NOTICE
February 17, 1985

CONVERT WELL TO SALTWATER DISPOSAL

Conoco Inc., 726 E. Michigan, P.O. Box 460, Hobbs, New Mexico, Mr. D.W. Johnson, Division Manager of Production, intends for the purpose of produced water disposal, to convert its Marshall Well No. 2 located 1980' FSL and 1910' FWL of Section 19, T-23-S, R-33-E, Lea County, New Mexico, or in the alternative, its Marshall Well No. 1 located 660' FSL and 660' FWL of same section, from a shut-in oil well to a saltwater disposal well, both wells being completed in the Cruz Delaware Pool. Operator plans to dispose of produced water at a rate of approximately 500 barrels per day with a surface pressure of about 400 psi. Any objections to this intent or requests for hearing must be filed with the New Mexico Oil Conservation Division, P.O. Box 2088, Santa Fe, New Mexico 87501 within 15 days from date of this publication.

BEFORE EXAMINER QUINTANA
OIL CONSERVATION DIVISION
EXHIBIT NO. 26
CASE NO. 8527
Submitted by CONOCO INC.
Hearing Date March 13, 1985