CHECKLIST for ADMINISTRATIVE INJECTION APPLICATIONS

Operator: Mewbourne Oil Corp Well: State 22 No. 1

Contact: Duane Brown Title: VP Eng Phone: 505.623.1996

DATE IN 3-27-97 RELEASE DATE 4-11-97 DATE OUT 5-19-97

Proposed Injection Application is for: ___ **WATERFLOOD** ___ Expansion ___ Initial

Original Order: R- _____ ___ Secondary Recovery ___ Pressure Maintenance

SENSITIVE AREAS X **SALT WATER DISPOSAL** ___ Commercial Well

___ WIPP ___ Capitan Reef

Data is complete for proposed well(s)? Yes Additional Data Req'd _____

AREA of REVIEW WELLS

0 Total # of AOR 1 # of Plugged Wells

1 Tabulation Complete ___ Schematics of P & A's

___ Cement Tops Adequate ___ AOR Repair Required

INJECTION FORMATION

Injection Formation(s) San Andres Compatible Analysis Yes

Source of Water or Injectate Area Production

PROOF of NOTICE

Yes Copy of Legal Notice ✓ Information Printed Correctly

✓ Correct Operators ✓ Copies of Certified Mail Receipts

No Objection Received No Set to Hearing _____ Date

NOTES: _____

APPLICATION QUALIFIES FOR ADMINISTRATIVE APPROVAL? Yes

COMMUNICATION WITH CONTACT PERSON:

1st Contact: ___ Telephoned ___ Letter _____ Date Nature of ~~Discussion~~

2nd Contact: ___ Telephoned ___ Letter _____ Date Nature of ~~Discussion~~

3rd Contact: ___ Telephoned ___ Letter _____ Date Nature of ~~Discussion~~

SWD 4/11/97

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

657

APPLICATION FOR AUTHORIZATION TO INJECT

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

II. Operator: Manzano Oil Corporation

Address: P.O. Box 2107, Roswell, NM 88202-2107

Contact party: Donnie E. Brown Phone: (505) 623-1996

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: Donnie E. Brown Title VP Engineering

Signature: Donnie E. Brown Date: March 11, 1997

* 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.

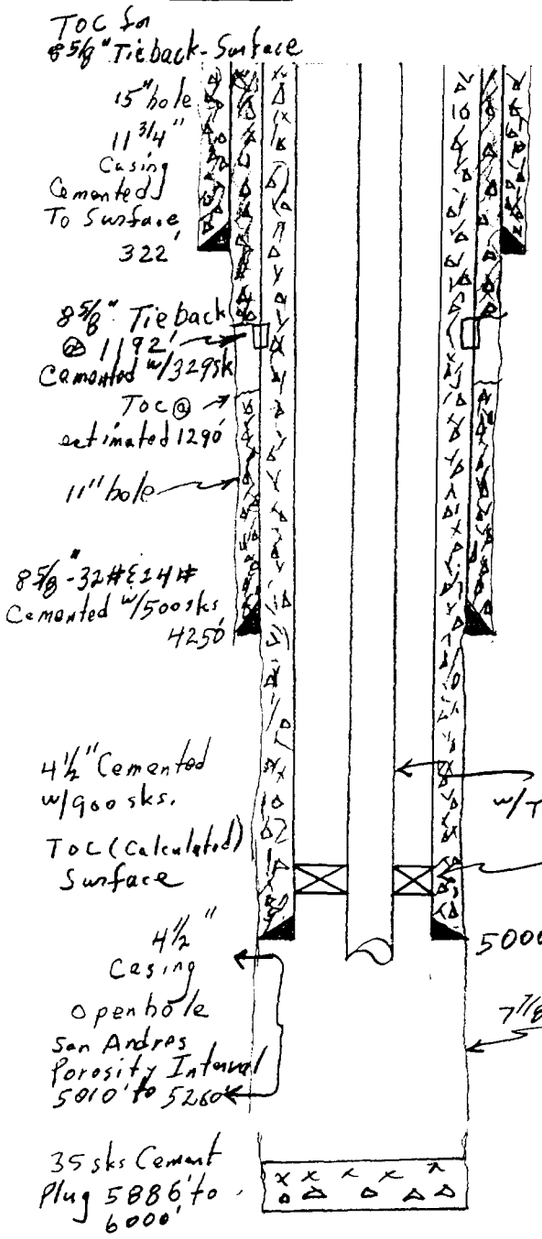
NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

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.

INJECTION WELL DATA SHEET

Manzano Oil Corporation	State "22"			
OPERATOR	LEASE			
1	2310'FSL & 990'FEL	22	10 South	37 East
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE

Schematic



Tabular Data

Surface Casing

Size 11-3/4" Cemented with 400 sx.

TOC surface feet determined by inspection

Hole size 15"

Intermediate Casing

Size 8-5/8" Cemented with 500 sx.

TOC surface feet determined by inspection

Hole size 11"

Long string

Size 4-1/2" Cemented with 900 sx.

TOC surface feet determined by volumetric

Hole size 7-7/8"

Total depth 5000'

Injection interval

5000' feet to 5886' feet

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

Tubing size 2-3/8" lined with Tuboscope TK-21 (material) set in a

Baker Loc-Set (brand and model) packer at 4990 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) _____

3. Is this a new well drilled for injection? [ ] Yes [X] No

   If no, for what purpose was the well originally drilled? Originally drilled to the Devonian to test for oil and gas. P&A 2/21/62. See attached schematic for P&A details.

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 zones perforated. Production casing never run. See attached schematic for P&A details of cement plugs.

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

   Overlying - None

Form C-108
Page Two
Dated: March 11, 1997
Operator: Manzano Oil Corporation
Well: State "22" #1
Sec 22, T10S, R37E
Lea County, NM

V. Map attached. See Exhibit V.

VI. No wells within the area of review (1/2 mile radius).

VII. 1. Average daily rate of salt water injected will be approximately 500 bbls/day. The maximum rate will be approximately 800 bbls/day. Volume of salt water injected will be approximately 15,000 bbls/month.

2. The system will be closed.

3. The average injection pressure is expected to be 100 psi. The maximum injection pressure should not be over 900 psi.

4. Sources for the disposal water will be the Manzano "SV" Sundown State #1, Section 14, T10S, R37E, and the Manzano "SV" Sunrise State #1, Section 15, T10S, R37E. Both wells produce from the Devonian. A water analysis of the produced water is attached. Exhibits VII.4a., b. and c.

5. Water analysis of San Andres zone is attached. Exhibit VII.5.a. Exhibit VII.5.b. is a comparison between the Devonian water and San Andres water. Scaling potential is nil to marginal.

VIII. The proposed zone for salt water disposal is the San Andres zone at a depth of 5010' in the Union Oil Company of California State "22" #1. The porous interval in which the salt water will be injected is from a depth of 5010' to 5260'. This interval consists of Dolomite. The closest San Andres oil production is some 4 miles to the northeast of this well, with oil production coming from the upper portion of the San Andres.

The maximum depth for underground sources of drinking water in the area is 300'. These zones will be protected with 13-3/8" and 8-5/8" casing with cement circulated to surface on both strings.

There are no underground sources of drinking water underlying the San Andres in this area.

IX. The proposed San Andres zone will be acidized with 10,000 gallons of 20% HCl acid if necessary.

X. There is no test data at this time on the San Andres. A copy of that portion of the sonic log and laterolog over the proposed disposal interval in the San Andres is attached (Exhibit X). A complete set of open hole logs of this well has already been filed with the division by Union Oil Company of California.

XI. Attached is a chemical analysis of a fresh water well that is within one mile of the proposed disposal. This sample was analyzed on 1/04/96. See Exhibit XI.

XII. Manzano Oil Corporation has examined all available geological and engineering data in the surrounding area of the proposed disposal well and finds no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

XIII. Proof of notice is attached. See Exhibit XIII.A. and XIII.B.

EXHIBIT V. - OCD FORM C-108

Proposed Saltwater
Disposal Well

State "22" #1
2310'FSL & 990'FEL
Section 22, T10S, R37E
Lea County, NM

MIDLAND © MAP

COCHRAN County

YOAKUM County

T 10 S

R36E

R37E

R38E

NORTH ECHOLS

ECHOLS

DICKINSON

DICKINSON EAST

CROSSROADS

EXHIBIT VII.4.a.

HE WESTERN COMPANY OF NORTH AMERICA

WATER ANALYSIS

HOBBS, NEW MEXICO LAB — ANALYSIS #: HB010501

GENERAL INFORMATION

OPERATOR:	MANZANO OIL CORP.	DEPTH:	0
WELL:	SV SUNDOWN ST. #1	DATE SAMPLED:	3/30/95
FIELD:		DATE RECEIVED:	3/30/95
FORMATION:		SUBMITTED BY:	
COUNTY:		WORKED BY:	MIKE LEE
STATE:		PHONE #:	505-392-5556

Send Data Sol. Diversion

SAMPLE DESCRIPTION: MORNING SAMPLE

Rw w/Eq. NaCl @ 190° = .204

PHYSICAL AND CHEMICAL DETERMINATIONS

SPECIFIC GRAVITY: 1.050 @ 62 °F — PH: 5.65

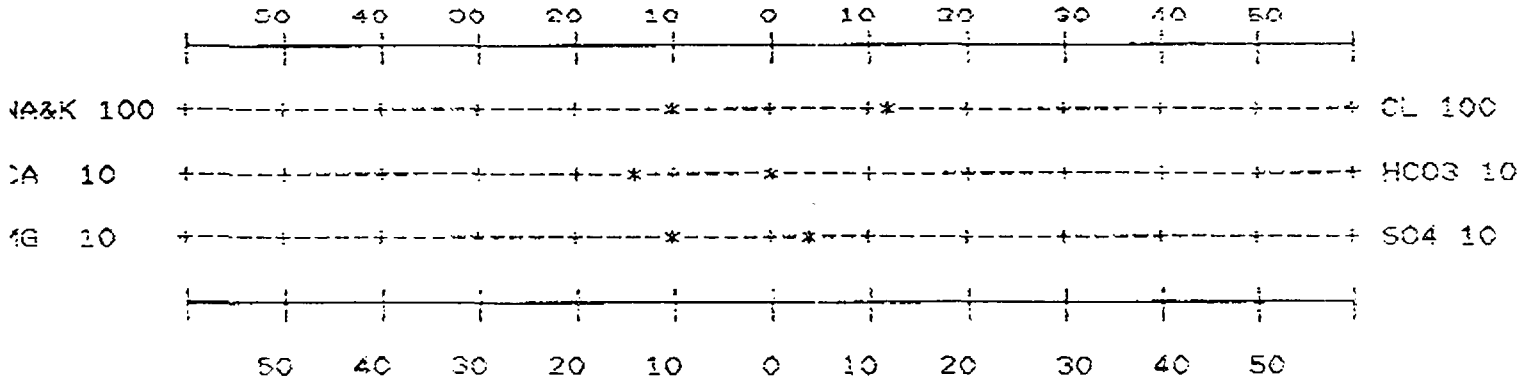
RESISTIVITY (CALC.): .095 OHMS @ 75 °F

ON (FE++):	2500 PPM	SULFATE:	1571 PPM
CALCIUM:	2667 PPM	TOTAL HARDNESS:	11905 PPM
MAGNESIUM:	1273 PPM	BICARBONATE:	465 PPM
CHLORIDE:	39991 PPM	SODIUM CHLORIDE (CALC)	65785 PPM
SODIUM+POTASS:	21396 PPM	TOT. DISSOLVED SOLIDS:	75330 PPM
	:	H2S	:NONE

REMARKS: 3PM SAMPLES DID NOT HAVE ENOUGH WATER FOR ANALYSIS.

API OIL GRAVITY FOR AFTERNOON SAMPLES WAS 37.5

STIFF TYPE PLOT (IN MEQ/L)



ANALYST _____

MIKE LEE

EXHIBIT VII.4.b.

DATE TAKEN	01-26-96	
REMARKS	Devonian Formation	
Barium as Ba	0.00	
Carbonate alkalinity PPM	0	
Bicarbonate alkilinity PPM	64	
pH at Lab	6.15	
Specific Gravity @ 60° F	1.042	
Magnesium as Mg	3,422	
Total Hardness as CaCO3	5,900	
Chlorides as Cl	25,063	
Sulfate as SO4	2,875	
Iron as Fe	72.50	
Potasslum	12.00	
Hydrogen Sulfide	0.00	
Resistivity Ohms	0.2490	25.7° C
Total Dissolved Solids	42,250	
Calcium as CA	2,478	
Nitrate	22.00	

Results reported as Parts per Million unless stated

Langelier Saturation Index -0.69

Analysis by Vickie Walker
Date: 01-31-96

Permian Treat:

WATER ANALYSIS REPORT

SAMPLE Devonian

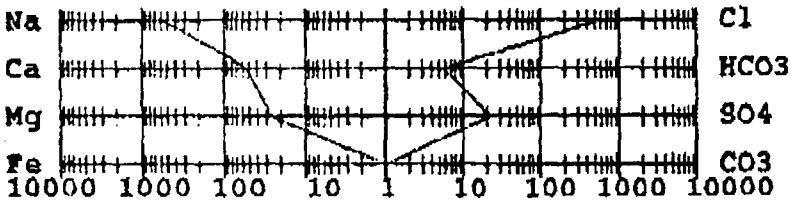
Oil Co. :
Lease : CW Trainer
Well No.: Morse #1 SW/NW Sec 27-T10S-R37E
Salesman:

Sample Loc. : Lea Co, New Mexico
Date Analyzed: 04-January-1996
Date Sampled :

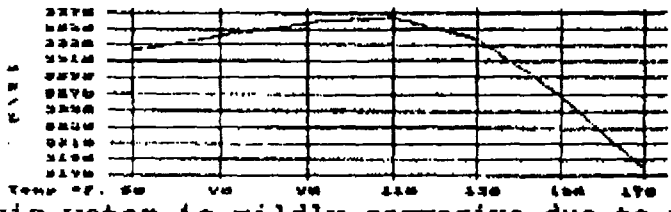
ANALYSIS

			MG/L	EQ. WT.	*MEQ/L
1.	pH		7.280		
2.	Specific Gravity 60/60 F.		1.028		
3.	$CaCO_3$ Saturation Index	@ 80 F.	+0.094		
		@ 140 F.	+1.064		
	Dissolved Gasses				
4.	Hydrogen Sulfide		Not Present		
5.	Carbon Dioxide		Not Determined		
6.	Dissolved Oxygen		Not Determined		
	Cations				
7.	Calcium	(Ca^{++})	1,002	/ 20.1 =	49.85
8.	Magnesium	(Mg^{++})	304	/ 12.2 =	24.92
9.	Sodium	(Na^{+}) (Calculated)	11,869	/ 23.0 =	516.04
10.	Barium	(Ba^{++})	Not Determined		
	Anions				
11.	Hydroxyl	(OH^{-})	0	/ 17.0 =	0.00
12.	Carbonate	(CO_3^{--})	0	/ 30.0 =	0.00
13.	Bicarbonate	(HCO_3^{-})	332	/ 61.1 =	5.43
14.	Sulfate	(SO_4^{--})	1,050	/ 48.8 =	21.52
15.	Chloride	(Cl^{-})	19,995	/ 35.5 =	563.24
16.	Total Dissolved Solids		34,552		
17.	Total Iron (Fe)		4	/ 18.2 =	0.19
18.	Total Hardness As $CaCO_3$		3,753		
19.	Resistivity @ 75 F. (Calculated)		0.235 /cm.		

LOGARITHMIC WATER PATTERN
*meq/L.



Calcium Sulfate Solubility Profile



PROBABLE MINERAL COMPOSITION

COMPOUND	EQ. WT.	X *meq/L =	mg/L.
$Ca(HCO_3)_2$	81.04	5.43	440
$CaSO_4$	68.07	21.52	1,465
$CaCl_2$	55.50	22.90	1,271
$Mg(HCO_3)_2$	73.17	0.00	0
$MgSO_4$	60.19	0.00	0
$MgCL_2$	47.62	24.92	1,187
$NaHCO_3$	84.00	0.00	0
$NaSO_4$	71.03	0.00	0
NaCl	58.46	515.42	30,131

*Milli Equivalents per Liter

This water is mildly corrosive due to the pH observed on analysis.
The corrosivity is increased by the content of mineral salts in solution.

Permian Treating Chemicals

WATER ANALYSIS REPORT

SAMPLE San Andres

Oil Co. : Coastal Oil & Gas
Lease : Sawyer
Well No.: Marr #3 NE/SE Sec 33 - T9S-R37E
Salesman: Lea Co, NM

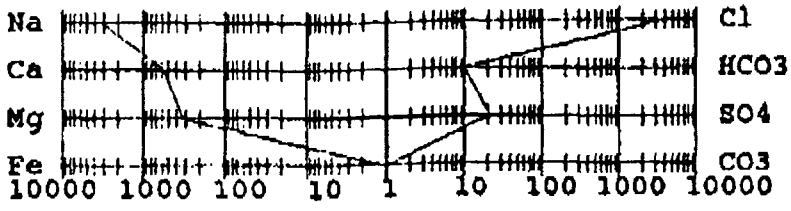
Sample Loc. :
Date Analyzed: 04-January-1996
Date Sampled :

ANALYSIS

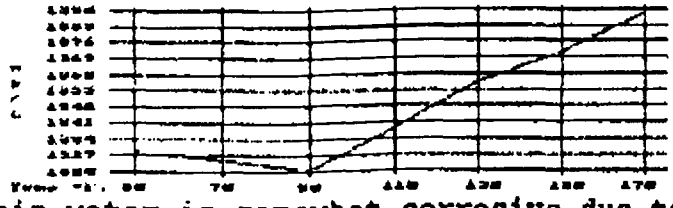
1.	pH		5.840	
2.	Specific Gravity 60/60 F.		1.155	
3.	$CaCO_3$ Saturation Index	@ 80 F.	+0.978	
		@ 140 F.	+2.738	

	Dissolved Gasses		MG/L	EQ. WT.	*MEQ/L
4.	Hydrogen Sulfide		Present		
5.	Carbon Dioxide		Not Determined		
6.	Dissolved Oxygen		Not Determined		
	Cations				
7.	Calcium	(Ca^{++})	11,022	/ 20.1 =	548.36
8.	Magnesium	(Mg^{++})	3,890	/ 12.2 =	318.85
9.	Sodium	(Na^{+}) (Calculated)	71,489	/ 23.0 =	3,108.22
10.	Barium	(Ba^{++})	Not Determined		
	Anions				
11.	Hydroxyl	(OH^{-})	0	/ 17.0 =	0.00
12.	Carbonate	(CO_3^{--})	0	/ 30.0 =	0.00
13.	Bicarbonate	(HCO_3^{-})	596	/ 61.1 =	9.75
14.	Sulfate	(SO_4^{--})	1,050	/ 48.8 =	21.52
15.	Chloride	(Cl^{-})	139,968	/ 35.5 =	3,942.76
16.	Total Dissolved Solids		228,015		
17.	Total Iron (Fe)		1	/ 18.2 =	0.05
18.	Total Hardness As $CaCO_3$		43,539		
19.	Resistivity @ 75 F. (Calculated)		0.001 /cm.		

LOGARITHMIC WATER PATTERN
*meq/L.



Calcium Sulfate Solubility Profile



PROBABLE MINERAL COMPOSITION

COMPOUND	EQ. WT.	X *meq/L =	mg/L.
$Ca(HCO_3)_2$	81.04	9.75	791
$CaSO_4$	68.07	21.52	1,465
$CaCl_2$	55.50	517.09	28,698
$Mg(HCO_3)_2$	73.17	0.00	0
$MgSO_4$	60.19	0.00	0
$MgCL_2$	47.62	318.85	15,184
$NaHCO_3$	84.00	0.00	0
$NaSO_4$	71.03	0.00	0
NaCl	58.46	3,106.82	181,625

*Milli Equivalents per Liter

This water is somewhat corrosive due to the pH observed on analysis.
The corrosivity is increased by the content of mineral salts, and the presence of H2S in solution.

EXHIBIT VII.5.b.

Comparison Between Two Waters

04-January-1996

TO: Permian Treating Chemicals Company : Devon Energy

Sample # 1
Morse #1 (Devonian ufr)

Sample # 2
Marr #3 (San Andres ufr)

Percent of #1 & #2	pH	TDS mg/L	SpGr	Saturation Index @80°F.	Saturation Index @140°F.	Calcium Sulfate Scaling Potential
100 - 0	7.280	34,552	1.028	+0.336	+1.140	Nil
95 - 5	7.208	44,225	1.034	+0.281	+1.120	Nil
90 - 10	7.136	53,898	1.041	+0.246	+1.027	Nil
85 - 15	7.064	63,571	1.047	+0.229	+0.967	Nil
80 - 20	6.992	73,245	1.053	+0.305	+1.056	Nil
75 - 25	6.920	82,918	1.060	+0.368	+1.132	Nil
70 - 30	6.848	92,591	1.066	+0.422	+1.198	Nil
65 - 35	6.776	102264	1.072	+0.469	+1.257	Nil
60 - 40	6.704	111937	1.079	+0.509	+1.311	Nil
55 - 45	6.632	121610	1.085	+0.545	+1.359	Nil
50 - 50	6.560	131284	1.092	+0.577	+1.404	Nil
45 - 55	6.488	140957	1.098	+0.605	+1.445	Nil
40 - 60	6.416	150630	1.104	+0.631	+1.483	Nil
35 - 65	6.344	160303	1.111	+0.654	+1.519	Nil
30 - 70	6.272	169976	1.117	+0.675	+1.553	Marginal
25 - 75	6.200	179649	1.123	+0.694	+1.584	Marginal
20 - 80	6.128	189322	1.130	+0.711	+1.614	Marginal
15 - 85	6.056	198996	1.136	+0.726	+1.642	Marginal
10 - 90	5.984	208669	1.142	+0.740	+1.669	Marginal
5 - 95	5.912	218342	1.149	+0.753	+1.694	Marginal
0 - 100	5.840	228015	1.155	+0.765	+1.718	Marginal

EXHIBIT X.

SONIC LOG

SCHLUMBERGER

SCHLUMBERGER WELL SURVEYING CORPORATION
Houston, Texas

COUNTY LEA
FIELD or LOCATION WILDCAT
WELL STATE 1 22
COMPANY UNION OIL COMPANY OF CALIFORNIA

COMPANY UNION OIL COMPANY OF CALIFORNIA
WELL STATE 1 22
FIELD WILDCAT
LOCATION SEC 22 T-10-S R-32-E
COUNTY LEA
STATE NEW MEXICO

Other Surveys
LL-MLL

Location of Well
2310' FSL
990' FEL

Elevations: K.B.: 3951
D.F.: 3949
or G.L.: 3938

Log Depths Measured From K.B. 13 Ft. above G.L.

RUN No.	ONE		
Date	2-19-62		
First Reading	12166		
Last Reading	100		
Feet Measured	12066		
Csg. Schlum.	4255		
Csg. Driller	4250		
Depth Reached	12173		
Bottom Driller	12180		
Mud Nat.	SALT GEL		
Dens. | Visc.	9.5 | 37		
Mud Resist.	.15 @ 58 °F	@ °F	@ °F
" Res. BHT	.04 @ 170 °F	@ °F	@ °F
" pH	5 @ °F	@ °F	@ °F
" Wtr. Loss	20.8 CC 30 min	CC 30 min	CC 30 min
" Rmf (M)	.10 @ 74 °F	@ °F	@ °F
Bit Size	7 7/8"		
Spacing:			
T 3 R 1 R	4950 To 5250	8950 To T.D.	To
T 3 R 3 R	CSG To F.R.	To	To
Opr. Rig Time	6 HRS.		
Truck No.	2522-BROWNFIELD		
Recorded By	KNAPP		
Witness	MARTIN		

5"=100'

SPONTANEOUS-POTENTIAL
millivolts

GAMMA RAY
API UNITS
0 100
100 200

DEPTHS

INTERVAL TRANSIT TIME
microseconds per foot
← increases
T 3 R 1 R
100 70 40

5000
5100
5200
5300

LATEROLOG

WITH GAMMA RAY

SCHLUMBERGER

SCHLUMBERGER WELL SURVEYING CORPORATION
Houston, Texas

COUNTY LEA
FIELD or LOCATION WILDCAT
WELL STATE 1 22
COMPANY UNION OIL COMPANY OF CALIFORNIA

COMPANY UNION OIL COMPANY OF CALIFORNIA
WELL STATE 1 22
FIELD WILDCAT
LOCATION SEC 22 T-10-S R-32-E
COUNTY LEA
STATE NEW MEXICO

Other Surveys
MLL-SGR

Location of Well
2310' FSL
990' FEL

Elevation: K.B.: 3951
D.F.: 3949
or G.L.: 3938

Log Depths Measured From K.B. 13 Ft. above G.L.

RUN No.	ONE			
Date	2-19-62			
First Reading	12170			
Last Reading	4255			
Feet Measured	7915			
Csg. Schlum.	4255			
Csg. Driller	4250			
Depth Reached	12174			
Bottom Driller	12180			
Mud Nat.	SALT GEL			
Dens. | Visc.	9.5 | 37			
Mud Resist.	.15 @ 58 °F	@ °F	@ °F	@ °F
" Res. BHT	.04 @ 170 °F	@ °F	@ °F	@ °F
" pH	5 @ °F	@ °F	@ °F	@ °F
" Wtr. Loss	20.8 CC 30 min	CC 30 min	@ °F	CC 30 min
" Rmf (M)	.10 @ 74 °F	@ °F	@ °F	@ °F
" Rmc (M)	.22 @ 74 °F			
Bit Size	7 7/8"			
Laterolog 3	o= 6" i.= 5'	o= i.=	o= i.=	o= i.=
Laterolog 7	o= i.=	o= i.=	o= i.=	o= i.=
Opr. Rig Time	3 HRS.			
Truck No.	2522-BROWNFIELD			
Recorded By	KNAPP			

DETAIL LOG
5"=100'

SPONTANEOUS-POTENTIAL
millivolts

GAMMA RAY
API UNITS
0 100
100 200

DEPTHS

RESISTIVITY
ohms. m²/m
0 50 100 150 200 250 313 417 625 1250

RESISTIVITY
ohms. m²/m
0 10

5000
5100
5200
5300

EXHIBIT XI.

Fresh Wtr - T10S-R37E-Lea Co, NM

Permian Treating Chemicals

WATER ANALYSIS REPORT

SAMPLE

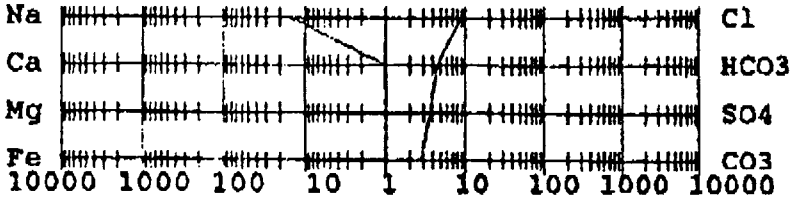
Oil Co. : Devon Energy
Lease : CW Trainer
Well No.: Fresh Water Well
Salesman:

Sample Loc. :
Date Analyzed: 04-January-1996
Date Sampled :

ANALYSIS

1.	pH		9.090		
2.	Specific Gravity 60/60 F.		1.003		
3.	$CaCO_3$ Saturation Index	@ 80 F.	+0.906		
		@ 140 F.	+1.606		
	Dissolved Gasses		**MG/L**	**EQ. WT.**	***MEQ/L**
4.	Hydrogen Sulfide		Not Present		
5.	Carbon Dioxide		Not Determined		
6.	Dissolved Oxygen		Not Determined		
	Cations				
7.	Calcium	(Ca^{++})	10	/ 20.1 =	0.50
8.	Magnesium	(Mg^{++})	6	/ 12.2 =	0.49
9.	Sodium	(Na^{+}) (Calculated)	348	/ 23.0 =	15.13
10.	Barium	(Ba^{++})	Below 10	(6)	
	Anions				
11.	Hydroxyl	(OH^{-})	0	/ 17.0 =	0.00
12.	Carbonate	(CO_3^{--})	77	/ 30.0 =	2.57
13.	Bicarbonate	(HCO_3^{-})	259	/ 61.1 =	4.24
14.	Sulfate	(SO_4^{--})	165	/ 48.8 =	3.38
15.	Chloride	(Cl^{-})	300	/ 35.5 =	8.45
16.	Total Dissolved Solids		1,088		
17.	Total Iron (Fe)		1	/ 18.2 =	0.05
18.	Total Hardness As $CaCO_3$		50		
19.	Resistivity @ 75 F. (Calculated)		2.963 /cm.		

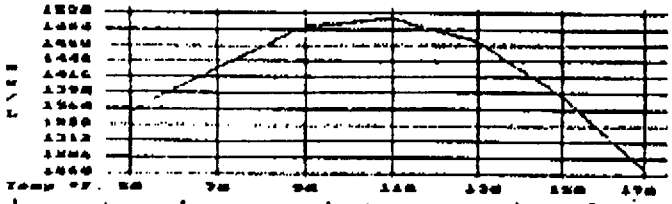
LOGARITHMIC WATER PATTERN
***meq/L.**



PROBABLE MINERAL COMPOSITION

COMPOUND	EQ. WT. X	*meq/L =	mg/L.
$Ca(HCO_3)_2$	81.04	0.50	40
$CaSO_4$	68.07	0.00	0
$CaCl_2$	55.50	0.00	0
$Mg(HCO_3)_2$	73.17	0.49	36
$MgSO_4$	60.19	0.00	0
$MgCL_2$	47.62	0.00	0
$NaHCO_3$	84.00	3.25	273
$NaSO_4$	71.03	3.38	240
NaCl	58.46	8.45	494

Calcium Sulfate Solubility Profile



*Milli Equivalents per Liter

This water is somewhat corrosive due to the pH observed on analysis.
The corrosivity is increased by the content of mineral salts in solution.

MANZANO OIL CORPORATION
APPLICATION FOR AUTHORIZATION TO INJECT
STATE "22" #1
LEA COUNTY, NEW MEXICO

CERTIFICATE OF SERVICE

I, Donnie E. Brown, Engineer, Manzano Oil Corporation, Operator of the State "22" #1, have on this 17th day of March, 1997, mailed or caused to be mailed, postage prepaid a copy of the Application for Authorization to Inject to the following persons at the address shown:

SURFACE OWNER

Mr. Ben Alexander
DASCO Land Corporation
P.O. Box 947
Hobbs, NM 88241-0947

OFFSET OPERATORS

Mr. Richard Lowery, Prod. Mgr.
Maralo, Inc.
P.O. Box 832
Midland, TX 79702

Mr. C.W. Trainer
TOCO, LLC.
P.O. Box 754
Midland, TX 79702

Mr. C.E. Hackstedt, VP Operations
UMC Petroleum Corporation
1201 Louisiana, Suite 1400
Houston, TX 77002-5603

Mr. John Yates, President
Yates Petroleum Corporation
105 South Fourth Street
Artesia, NM 88210

Donnie E. Brown, VP Engineering

State of New Mexico)
)
County of Chaves)

The foregoing instrument was acknowledged before me this 17th day of March, 1997, by Donnie E. Brown, Vice President of Engineering, Manzano Oil Corporation, on behalf of said corporation.

My commission expires:

9/23/97

M. Allison Hernandez, Notary Public in and for the State of New Mexico

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Ben Alexander
DASCO Land Corporation
P.O. Box 947
Hobbs, NM 88241-0947

4a. Article Number
P 382 741 480

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
3-18

5. Signature (Addressee)
Paula Smith

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

Thank you for using Return Receipt Service.

PS Form **3811**, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
John Yates, President
Yates Petroleum Corporation
105 South Fourth Street
Artesia, NM 88210

4a. Article Number
P 382 741 479

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
3-18-97

5. Signature (Addressee)
GRIGGS

6. Signature (Agent)
J Briggs

8. Addressee's Address (Only if requested and fee is paid)

Thank you for using Return Receipt Service.

PS Form **3811**, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
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- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Mr. Richard Lowery, Prod Mgr
Maralo, Inc.
P.O. Box 832
Midland, TX 79702

4a. Article Number
P 382 741 476

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
MAR 18 1997

5. Signature (Addressee)
D Guzman

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)

PS Form **3811**, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
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- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Mr. C.W. Trainer
TOCO, L.L.C.
P.O. Box 754
Midland, TX 79702

4a. Article Number
P 382 741 477

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
MAR 19 1997

5. Signature (Addressee)
C.W. Trainer

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)

PS Form **3811**, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

DOWNTOWN STA MIDLAND TX MAR 19 1997 USPS

Thank you for using Return Receipt Service.

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
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I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Mr. C.E. Hackstedt, VP Oper
UMC Petroleum Corporation
1201 Louisiana, Suite 1400
Houston, TX 77002-5603

4a. Article Number
P 382 741 478

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
21 MAR 1997

5. Signature (Addressee)
V. C Hackstedt

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)

PS Form **3811**, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

EXHIBIT XIII.B.

Affidavit of Publication

STATE OF NEW MEXICO)
) ss.
COUNTY OF LEA)

Joyce Clemens being first duly sworn on oath deposes and says that he is Adv. Director of THE LOVINGTON DAILY LEADER, a daily newspaper of general paid circulation published in the English language at Lovington, Lea County, New Mexico; that said newspaper has been so published in such county continuously and uninterruptedly for a period in excess of Twenty-six (26) consecutive weeks next prior to the first publication of the notice hereto attached as hereinafter shown; and that said newspaper is in all things duly qualified to publish legal notices within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico.

That the notice which is hereto attached, entitled

Legal Notice

Manzano Oil Corporation

~~and numbered~~ .... ~~in the~~

.... ~~Court of Lea~~

~~County, New Mexico~~, was published in a regular and entire issue of THE LOVINGTON DAILY LEADER and not in any supplement thereof, ~~once each week on the~~ ~~same day of the week~~, for one(1) day

~~consecutive weeks~~, beginning with the issue of

March 19, 19 97

and ending with the issue of

March 19, 19 97

And that the cost of publishing said notice is the sum of $ 16.56

which ~~sum~~ has been (Paid) (Assessed) as Court Costs

Joyce Clemens

Subscribed and sworn to before me this 20th

day of March, 19 97

Jean [illegible]

Notary Public, Lea County, New Mexico

My Commission Expires Sept. 28, 19 98

LEGAL NOTICE
LEA COUNTY,
NEW MEXICO
Manzano Oil Corporation
P.O. Box 2107
Roswell, New Mexico
[illegible]
Phone Number:
[illegible]
Contact Party:
[illegible]
VP Engineering

Manzano Oil Corporation proposes to convert the [illegible] Union Oil Company of [illegible] #1 [illegible] disposal [illegible] #1 is located [illegible] FSL & [illegible] of Section 22, Township 10 South, Range 37 East, Lea County, New Mexico.

[illegible] barrels of water per day maximum shall be injected [illegible] into the [illegible] Zone at a depth of 5010' to [illegible].

Interested parties must file objections or request a hearing with the New Mexico Oil Conservation Division, P.O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.
Published in the Lovington Daily Leader March 19, 1997.

Manzano Oil Corporation

P.O. Box 2107
Roswell, New Mexico 88202-2107
(505) 623-1996
FAX (505) 625-2620

April 8, 1997

Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87501

Re: Manzano Oil Corporation's
State "22" #1 SWD Application
2310'FSL & 990'FEL
Section 22, T10S, R37E
Lea County, New Mexico

Gentlemen:

Attached is the Affidavit of Publication from the Hobbs Daily News-Sun on the captioned. All other paperwork has been previously submitted.

If you have any questions, please do not hesitate to call.

Sincerely,

Allison Hernandez
Engineering Technician

:ah

Enclosure

AFFIDAVIT OF PUBLICATION

State of New Mexico,
County of Lea.

I, KATHI BEARDEN

Publisher

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 1

weeks.

Beginning with the issue dated

March 21, 1997

and ending with the issue dated

March 21, 1997

Kathi Bearden

Publisher

Sworn and subscribed to before me this 26th day of March, 1997

Jodi Henson

Notary Public.

My Commision expires
October 18, 2000
(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.

PWAL

LEGAL NOTICE
March 21, 1997

Manzano Oil Corporation proposes to convert the plugged and abandoned Union Oil Company California State "22" #1 well to a water disposal well. The State "22" #1 is located 2310 'FSL & 990' FEL of Section 22, Township 10 South, Range 37 East, Lea County, New Mexico.

800 barrels of water per day maximum shall be injected at 900 psi into the San Andres zone at a depth of 5010' to 5260'.

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

#15101

01101555000 01506530

Manzano Oil Corporation
P.O. Box 2107
a/c 448273
Roswell, NM 88202-2107

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

HOBBS DISTRICT OFFICE

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:

Manzano Oil Corp State 22 #1-J 22-10s-37e
Operator Lease & Well No. Unit S-T-R

and my recommendations are as follows:

OK

Yours very truly,

Jerry Sexton
Supervisor, District 1

/ed