WFX 5-3-96

WFX-686

MEWBOURNE OIL COMPANY

P.O. BOX 7698
TYLER, TEXAS 75711
903 - 561-2900
FAX 903 - 561-1870

April 15, 1996

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
NO. Z 077 781 632

State of New Mexico
Oil Conservation Division
2040 S. Pacheco
Santa Fe, New Mexico 87505

Attention: Mr. David Catanach

Re: Application for Authority to Inject
Hanley "24" Federal No. 1
Lea County, New Mexico

Mr. Catanach:

Attached is Mewbourne Oil Company's application requesting approval to inject water into the referenced well. The subject well is currently plugged and will require re-entry. The 40-acre lease associated with this well expired in late 1992. Mewbourne Oil Company then leased said acreage in October 1994 in order to expand the Querecho Plains Bone Spring Sand Unit and re-enter the referenced well as an injector. The Bureau of Land Management has provided initial approval to said expansion (see attached) and should provide final approval by May 1996. The Operating Committee for said Unit has also approved said expansion (see attached). As a result, administrative approval is requested in accordance with Division Order R-9737-A which permits the injection of water at the Querecho Plains Bone Spring Sand Unit and Division Rule 701.6.7 which grants an exception to hearing for this cause. All necessary notices are mailed as of today with a "Service List" attached for your convenience.

If you have any questions regarding this application, please contact me at (903) 561-2900.

Your truly

Kevin Mayes, P.E.
Project Engineer

KM:gt
Attachments

SERVICE LIST

Mr. David Catanach
State of New Mexico
Oil Conservation Division
2040 S. Pacheco
Santa Fe, New Mexico 87505

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

Bureau of Land Management
Carlsbad Resource Area Headquarters
P. O. Box 1778
Carlsbad, New mexico 88220

Lovington Daily Leader
P. O. Drawer 1717
Lovington, New Mexico 88260

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
ROSWELL DISTRICT OFFICE
1717 West Second Street
Roswell, New Mexico 88202

IN REPLY REFER TO:
3180 (06200)
NMNM88523X

FEB 15 1996

Mewbourne Oil Company
Attention: Mr. K.M. Calvert
P.O. Box 7698
Tyler, Texas 75711

RE: Proposed Expansion
Querecho Plains Bone Spring Unit
Lea County, New Mexico

Dear Mr. Calvert:

Mewbourne Oil Company has proposed that the referenced unit be expanded to include the following lands:

NWNW, Section 24, T. 18 S, R. 32 E.
Lea County, New Mexico

consisting of 40.00 acres, more or less. These lands would be assigned no unit participation, but would contribute an injection well for the benefit of the unit. We have reviewed this proposal and are in agreement that the lands may be brought into the unit without tract participation.

The proposed expansion may be accomplished pursuant to Article 4, Expansion, of the Querecho Plains Bone Spring Unit Agreement dated November 1, 1993. Approval of the proposed expansion by the Working Interest owners is required. The effective date of the expansion will be the first day of the month subsequent to the date of notice and approval by this office. No retroactive allocation of production will be allowed.

Exhibits A and B to the Unit Agreement must be revised appropriately and copies submitted to this office.

Sincerely,

Tony L. Ferguson

Tony L. Ferguson
Assistant District Manager,
Minerals Support Team

MINUTES
QUERECHO PLAINS BONE SPRING SAND UNIT
Thursday, March 21, 1996
Offices of Mewbourne Oil Company
Midland, Texas

Attendees

Ken Calvert - Mewbourne Oil Company, Tyler, Texas
Kevin Mayes - Mewbourne Oil Company, Tyler, Texas
James Blount - Santa Fe Energy, Midland, Texas
Sharon Haggard - OXY USA, Midland, Texas

Action Taken

1. Approved expanding the unit by 40 acres to include the NW/4 SW/4 of Section 24, T18S-R32E.

2. Approved re-entering the plugged wellbore located on the 40 acre tract from action on Item 1.

Discussion

Mr. Calvert called the meeting to order at 10:00 AM. The agenda was approved as distributed. Mr. Mayes read the minutes from the last meeting of March 14, 1994.

Mr. Calvert discussed the poll votes for working on wells QPBSSU 11-2 and QPBSSU 14A-1 had passed. Work on well QPBSSU 11-2 involved completion as a dual injector (Bone Spring/Queen). This work was successfully completed in August 1995. Work on well QPBSSU 14A-1 involved installing rod pump equipment on the last flowing well in the field. This work was successfully completed in December 1995.

Mr. Calvert discussed a new stripper royalty rate was approved for the unit by the Minerals Management Service. The new royalty rate for the unit is 2.9 percent versus the 7.3 percent individual well weighted average rate approved prior to November 1, 1994 versus 12.5 percent with no stripper rate reduction.

Mr. Calvert discussed approval is given to the unit by the State of New Mexico for using an EOR severance tax rate. The Severance tax rate on oil is cut in half for approved EOR projects from 3.5 percent to 1.75 percent. The Conservation, School and Ad Valorem tax rates and the Severance tax rate on gas is not affected.

Mr. Mayes discussed the State of the Unit while distributing a field production curve, a step-rate plot for well E-10 (7A-10), and a daily injection curve for well 3-7. It was discussed that the breakthrough problems presented at the last meeting have been successfully managed and present no current problems. Well 3-5 which was the worst contributor to the breakthrough problem was converted back to production in March 1994 and is currently one of the best producers in the field. The field has seen significant response (see attached curve). The current priority for the flood is working to keep the injection side maximized. Step-rate testing has been ongoing for several months and should conclude soon with application to the NMOCD for surface injection pressures of 2300 psi versus the currently approved 2000 psi. The disappointment of the flood at this time is the discovery of large amounts of "build-up" in the injection wells. Analysis of this build-up indicates mostly iron oxide with varying amounts of calcium carbonate, iron sulfides and hydrocarbons. The build-up is completely acid soluble. The large amount of iron oxide suggests the build-up occurred while these wells were on production or due to the oxygen from Carlsbad's Double Eagle fresh water. Samples of the build-up were provided to the attendees with solicitation made for any ideas to prevent the build-up. None was provided. Mewbourne will work diligently to resolve the problem; however, members may expect elevated operating costs until the issue is resolved.

Mr. Calvert discussed expanding the unit by 40 acres while distributing a plat of the subject. Mr. Calvert discussed he secured Titan's approval just before the meeting and now had 74.39 percent approving the expansion. Mr. Calvert called for any approvals from the attendees. Santa Fe Energy provided their approval. Mr. Calvert discussed that the approval was now 86.87 percent and expansion of the unit was formally approved.

Mr. Calvert discussed re-entering the plugged wellbore that exists on the proposed expansion tract while distributing AFE No. 960103. Mr. Calvert discussed he secured Titan's approval just before the meeting and now had 74.39 percent approving the re-entry. Mr. Calvert called for any approvals from the attendees. Santa Fe Energy provided their approval. Mr. Calvert discussed that the approval was now 86.87 percent and re-entering the wellbore to be called QPBSSU 16-1 was formally approved.

Mr. Calvert asked if there were any amendments to the agenda or a desire for an open forum. None was requested. The meeting was adjourned.

K. M. Calvert

K. M. Calvert, Chairman

Kevin Mayes

Kevin Mayes, Secretary

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

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

FORM C-108
Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT

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

II. Operator: Mewbourne Oil Company

Address: P. O. Box 7698, Tyler, Texas 75711

Contact party: Kevin Mayes Phone: (903) 561-2900

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? [X] yes [ ] no
If yes, give the Division order number authorizing the project R-9737-A.

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: Kevin Mayes Title Project Engineer

Signature: Kevin Mayes Date: April 15, 1996

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.

ITEM III OF NEW MEXICO OCD FORM C-108

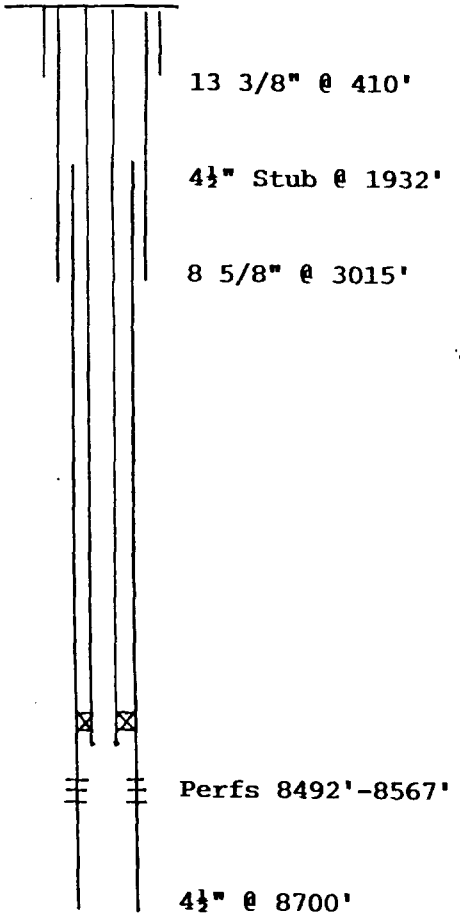
INJECTION WELL DATA SHEET

Mewbourne Oil Company (OPERATOR) Hanley "24" Federal (LEASE)

1 (WELL NO.) 2310' FSL, 330' FWL (FOOTAGE LOCATION) 24 (SECTION) 18S (TOWNSHIP) 32E (RANGE)

Lea County, New Mexico

Schematic



Tabular Data

Surface Casing

Size 13 3/8 " Cemented with 400 sx.

TOC Surface feet determined by Circulated

Hole size 17 1/2"

Intermediate Casing

Size 8 5/8" " Cemented with 800 sx.

TOC Surface feet determined by Circulated

Hole size 12 1/4"

Long string

Size 4 1/2 " Cemented with 1525 sx.

TOC 1950 feet determined by Free Point

Hole size 7 7/8"

Total depth 8700'

Injection interval

8492 feet to 8567 feet

(perforated or open-hole, indicate which)

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

Otis Perma-latch (brand and model) packer at 8392 feet

(or describe any other casing-tubing seal).

Other Data

1. Name of the injection formation 1st Bone Spring Sand

2. Name of Field or Pool (if applicable) Querecho Plains

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

If no, for what purpose was the well originally drilled? 1st Bone Spring Oil Production - Well was plugged in September 1992

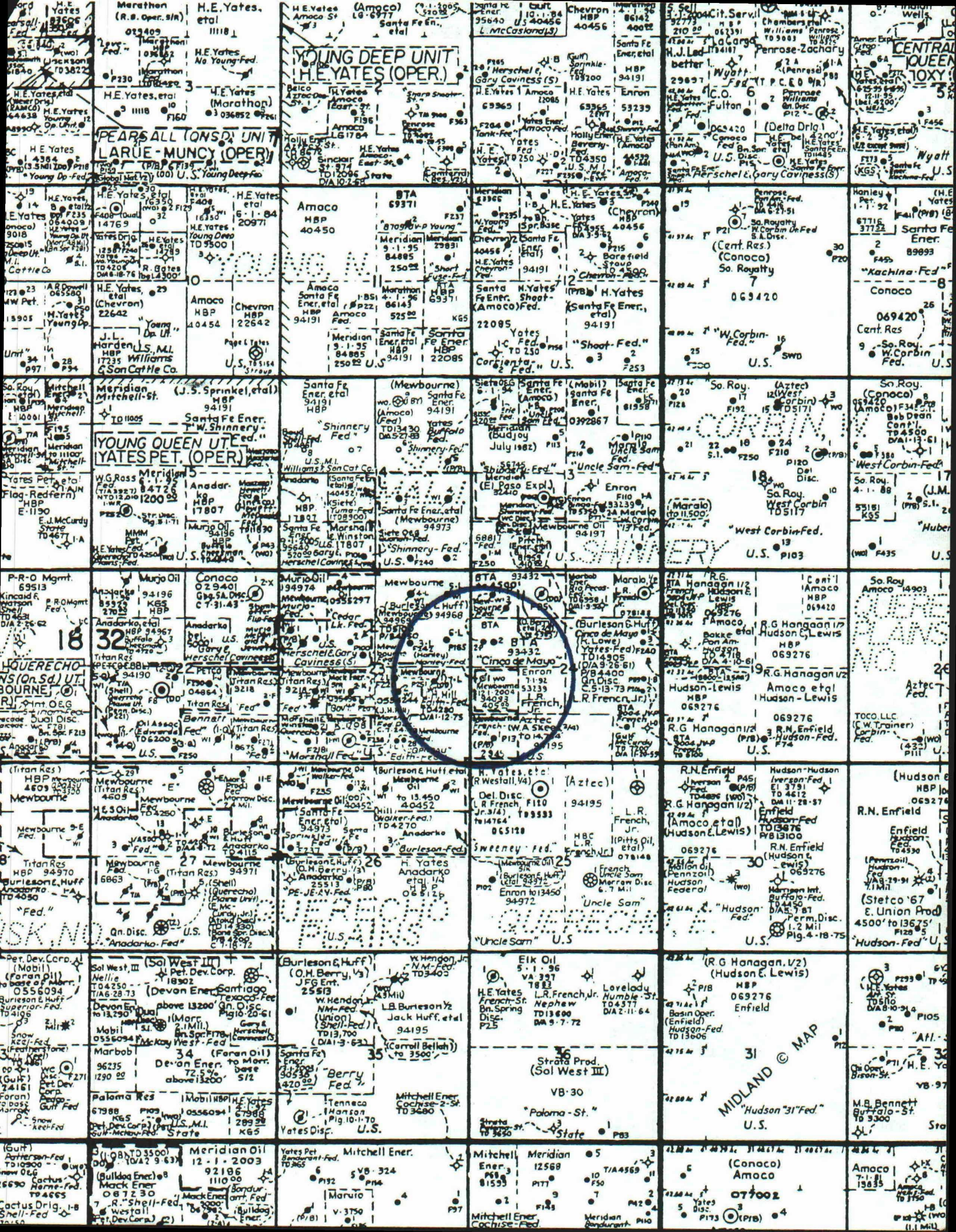
4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail (sacks of cement or bridge plug(s) used)

No

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

Above - Delaware

Below - 2nd Bone Spring Carbonate


YOUNG DEEP UNIT
H.E. YATES (OPER.)
PEARSALL TONSO UNIT
LARUE-MUNCY (OPER)
YOUNG
CORBIN
YOUNG QUEEN UT.E.
YATES PET. (OPER.)
SHINNERY
SUPER PANS
No. 2
MIDLAND © MAP
Marathon (R.R. Oper. S/R)
H.E. Yates, etal
Amoco
Santa Fe Energy etal
Meridian
Mitchell St.
Sprinkel, etal
Santa Fe Ener.
"W. Shinnery - Fed."
Meridian 5
Anadarko
Murjo Oil
Conoco
Mewbourne
Titan Res
Bennett Fed
Burleson & Huff
Sol West III
Pet. Dev. Corp.
Devon Ener.
Santiago
Texaco-Fee
Mobil
Foran Oil
Paloma Res
Meridian Oil
Mack Ener
Bulldog Ener.
Mitchell Ener.
Yates Pet.
Maruto
Chevron
Enron
Aztec
Gulf
Sweeney - Fed.
Uncle Sam
Hudson - Hudson
Enfield
Hudson - Fed
Hudson "31" Fed.
Stratta Prod.
(Sol West III)
VB-30
"Paloma - St."
Lovelady
Humble - St.
Jack Huff, etal
94195
Cactus Drlg.
Shell-Fed
Westall
Cactus Horne-Fed.
Patterson-Fed
Basin Oper. (Enfield)
Hudson-Fed
Penrose-Zachary
Penrose Williams
Fulton
Wyatt Fed
Central Queen Oxy
Santa Fe Ener.
Kachina-Fed
Conoco
Cent. Res
So. Royalty
W. Corbin Fed.
West Corbin-Fed
Huber
Aztec Fed.
Titan Res
Mewbourne
Burleson-Fed
Hudson-Lewis
Amoco etal
Hudson-Lewis
R.N. Enfield
Hudson-Fed.
Enfield
Hudson-Fed
Stetco '67
E. Union Prod
4500' to 13675'
Hudson-Fed
M.B. Bennett
Buffalo-St.
Amoco
077002
(Conoco)
Amoco
Mitchell Ener.
Cochise-Fed
Meridian
Bondurant-Fed
Yates Pet.
Bondurant-Fed
Mitchell Ener.
Cochise-2-St.
Tenneco
Hanson
Pig. 10-1-70
Yates Disc.
U.S.
State
Fed.
Disc.
Qn. Disc.
Abnd.
Inj.
Gas
Oil
Prod.
Comp.
Loc.
Spud
Elev.
TD
PB
Perf.
Acid
Frac
Csg.
Tbg.
Pkr.
Rods
Pump
Allow.
Gravity
GOR
Chk.
Press.
Swab
Test
Pay
Zone
Sand
Lime
Shale
Water
Salt
Anhy
Base
Top
Core
DST
Log
Survey
Plat
Lease
Well
Unit
Block
Section
Survey
Abstract
County
State
Operator
Address
Phone
Telex
Cable
Code
Date
Time
Day
Night
Weather
Temp
Wind
Rain
Snow
Ice
Fog
Haze
Smoke
Dust
Sand
Storm
Tornado
Hurricane
Earthquake
Flood
Drought
Fire
Explosion
Accident
Injury
Death
Arrest
Court
Jail
Prison
Parole
Probation
Fine
Bail
Bond
Lawyer
Judge
Jury
Verdict
Appeal
Reversal
Affirmed
Remanded
Dismissed
Settled
Pending
Filed
Docketed
Argued
Submitted
Decided
Opinion
Concurring
Dissenting
Majority
Minority
Plurality
Per Curiam
Memorandum
Order
Judgment
Decree
Injunction
Mandamus
Habeas Corpus
Certiorari
Prohibition
Quo Warranto
Declaratory
Relief
Damages
Costs
Fees
Attorney
Client
Privilege
Confidential
Work Product
Discovery
Deposition
Interrogatory
Request
Admission
Production
Subpoena
Duces Tecum
Ad Testificandum
Contempt
Sanction
Default
Summary
Judgment
Motion
Hearing
Trial
Evidence
Exhibit
Witness
Testimony
Cross
Direct
Redirect
Recross
Rebuttal
Surrebuttal
Argument
Brief
Record
Transcript
Reporter
Clerk
Bailiff
Sheriff
Deputy
Constable
Marshal
Warrant
Search
Seizure
Arrest
Booking
Fingerprint
Photograph
Lineup
Identification
Alibi
Confession
Miranda
Rights
Counsel
Appointed
Public Defender
Grand Jury
Indictment
Information
Complaint
Misdemeanor
Felony
Capital
Life
Death
Penalty
Sentence
Probation
Parole
Pardon
Commutation
Reprieve
Clemency
Board
Governor
Legislature
Statute
Code
Ordinance
Regulation
Rule
Procedure
Evidence
Constitution
Amendment
Due Process
Equal Protection
Search and Seizure
Self-Incrimination
Double Jeopardy
Cruel and Unusual
Bail
Speedy Trial
Jury Trial
Confrontation
Compulsory Process
Assistance of Counsel
Privileges and Immunities
Commerce
Taxation
Eminent Domain
Contracts
Torts
Negligence
Strict Liability
Products Liability
Malpractice
Defamation
Libel
Slander
Privacy
Publicity
Trespass
Nuisance
Conversion
Replevin
Detinue
Trover
Bailment
Agency
Partnership
Corporation
Securities
Antitrust
Monopoly
Restraint of Trade
Price Fixing
Boycott
Tying
Exclusive Dealing
Merger
Acquisition
Divestiture
Injunction
Damages
Treble Damages
Attorney's Fees
Class Action
Derivative Action
Shareholder
Director
Officer
Fiduciary
Duty
Loyalty
Care
Business Judgment
Insider Trading
Proxy
Tender Offer
Williams Act
Hart-Scott-Rodino
Sherman Act
Clayton Act
Robinson-Patman
Federal Trade Commission
Securities and Exchange Commission
Department of Justice
Antitrust Division
Civil Division
Criminal Division
Tax Division
Environment and Natural Resources Division
Land and Natural Resources Division
Solicitor General
Office of Legal Counsel
Office of Legal Policy
Office of Professional Responsibility
Office of Inspector General
Office of Intelligence Policy and Review
Office of Justice Programs
Office of Juvenile Justice and Delinquency Prevention
Office of Victims of Crime
Office of Violence Against Women
Office of Community Oriented Policing Services
Office of Tribal Justice
Office of Sex Offender Sentencing, Monitoring, Apprehending, Registering, and Tracking
Office of Legislative Affairs
Office of Public Affairs
Office of Intergovernmental and Public Liaison
Office of Policy Development
Office of Legal Policy
Office of Professional Responsibility
Office of Inspector General
Office of Intelligence Policy and Review
Office of Justice Programs
Office of Juvenile Justice and Delinquency Prevention
Office of Victims of Crime
Office of Violence Against Women
Office of Community Oriented Policing Services
Office of Tribal Justice
Office of Sex Offender Sentencing, Monitoring, Apprehending, Registering, and Tracking
Office of Legislative Affairs
Office of Public Affairs
Office of Intergovernmental and Public Liaison
Office of Policy Development

OK 6-21-96

ITEM VI OF NEW MEXICO FORM C-108
WELLS WITHIN REVIEW AREA WHICH PENETRATE THE 1ST BONE SPRING SAND
QUERECHO PLAINS BONE SPRINGS SAND UNIT

OPERATOR	LEASE/WELL	LOCATION	TYPE	CONSTRUCTION	TOP OF CEMENT	DATE DRILLED	TD	COMPLETION & COMMENTS
MEWBOURNE OIL CO.	QPBSSU 3-5 (O/H FED L #5)	T18S, R32E, SEC 23 660 FNL, 660 FEL	OIL	13 3/8 @ 460' CMT W/ 400 SX 8 5/8 @ 4330' CMT W/ 1575 SX 5 1/2 @ 8650' CMT W/ 1275 SX	SURFACE(V) SURFACE(V) 2763'	4/17/88	8650'	OPEN PERFS 8430'-8574'
MEWBOURNE OIL CO.	QPBSSU 3-3 (O/H FED L#3)	T18S, R32E, SEC 23 1980 FNL, 1650 FEL	OIL	13 3/8 @ 450' CMT W/ 416 SX 8 5/8 @ 4315' CMT W/ 1700 SX 5 1/2 @ 8698' CMT W/ 1475 SX	SURFACE(V) SURFACE(V) 1342'	6/19/87	8698'	PERF & TEST 8598'-8610' CIBP @ 8585' OPEN PERFS 8446'-8530'
MEWBOURNE OIL CO.	QPBSSU 3-6 (O/H FED L#6)	T18S, R32E, SEC 23 1880 FNL, 660 FEL	OIL	13 3/8 @ 448' CMT W/ 475 SX 8 5/8 @ 4330' CMT W/ 1575 SX 5 1/2 @ 8650' CMT W/ 1400 SX	SURFACE(V) SURFACE(V) SURFACE(V)	7/24/88	8650'	OPEN PERFS 8436'-8520'
MEWBOURNE OIL CO.	QPBSSU 3-7 (O/H FED L#7) (O/H EDITH FED #1)	T18S, R32E, SEC 23 2310 FSL, 990 FEL	OIL	8 5/8 @ 356' CMT W/ 250 SX 5 1/2 @ 8670' CMT W/ 4630 SX	SURFACE(V) SURFACE(V)	5/14/88	8670'	DEEPEN FROM OTD @ 4281' (1975) OPEN PERFS 8485'-8552'
MEWBOURNE OIL CO.	QPBSSU 3-2 (O/H FED L#2)	T18S, R32E, SEC 23 2310 FSL, 2030 FEL	OIL	13 3/8 @ 441' CMT W/ 450 SX 8 5/8 @ 4293' CMT W/ 1800 SX 5 1/2 @ 8750' CMT W/ 925 SX	SURFACE(V) SURFACE(V) 3538'(CBL)	10/14/86	8750'	OPEN PERFS 8458'-8531'
MEWBOURNE OIL CO.	QPBSSU 2A-1 (O/H FED P#1)	T18S, R32E, SEC 24 660 FNL, 660 FWL	OIL	13 3/8 @ 452' CMT W/ 450 SX 8 5/8 @ 4347' CMT W/ 1600 SX 5 1/2 @ 8680' CMT W/ 1425 SX	SURFACE(V) SURFACE(V) 2100'	3/31/89	8680'	OPEN PERFS 8473'-8545'
MEWBOURNE OIL CO.	QPBSSU 2A-2 (O/H FED P#2)	T18S, R32E, SEC 24 1980 FNL, 330 FWL	OIL	13 3/8 @ 430' CMT W/ 450 SX 8 5/8 @ 4330' CMT W/ 1950 SX 5 1/2 @ 8725' CMT W/ 1425 SX	SURFACE SURFACE 1618'	8/05/89	8725'	OPEN PERFS 8468'-8524'
MEWBOURNE OIL CO.	QPBSSU 6-1 (O/H FRENCH FED #1)	T18S, R32E, SEC 24 660 FSL, 660 FWL	OIL	11 3/4 @ 350' CMT W/ 725 SX 8 5/8 @ 2800' CMT W/ 2000 SX 4 1/2 @ 8700' CMT W/ 780 SX	SURFACE SURFACE 5742'	2/15/86	8700'	PERF & PROD 8534'-8568' CIBP @ 8440' OPEN PERFS 6650'-6670' SQZ 6650'-6670' W/ 219SX CLEAN OUT TO 8654' OPEN PERFS 8534'-8568'

NOTE: TOP OF CEMENT IS CALCULATED WITHOUT COMPENSATION FOR COLLARS AND USES 75% FOR EXCESS. CALCULATIONS ASSUME SLURRY YIELDS OF 1.32 CUFT/SX FOR SURFACE AND INTERMEDIATE CASING, AND 1.08 CUFT/SX FOR PRODUCTION CASING. V=VISUAL & CBL=CMT BOND LOG.

ITEM VII OF NEW MEXICO OCD FORM C-108
DATA ON PROPOSED OPERATIONS
QUERECHO PLAINS BONE SPRING SAND UNIT

ITEM VII (1) Proposed maximum injection rate is 500 bwpd.

ITEM VII (2) The injection system will be operated as a closed system.

ITEM VII (3) The proposed maximum injection pressure is 2000 psi. Said pressure is the same approved for fourteen injection wells currently in operation at the unit per Division Order R-9737-A.

ITEM VII (4) The source of injection water for the subject unit will be fresh water supplied by the City of Carlsbad's Double Eagle system, Delaware produced water, Queen produced water and recycled Bone Spring produced water. These waters have been the source used at the unit for two and a half (2 1/2) years with no problems.

ITEM VII (5) Not applicable.

ITEM VIII OF NEW MEXICO OCD FORM C-108
GEOLOGIC DATA ON THE INJECTION ZONE & UNDERGROUND DRINKING WATER
QUERECHO PLAINS BONE SPRINGS SAND UNIT

The zone being targeted for water injection at Querecho Plains is the First Bone Spring sand at depths from 8328'-8620' in the well Federal L NO. 4, Section 23, T18S, R32E. The First Bone Spring sands are a sequence of well consolidated sandstone, siltstone, and shale strata, with localized carbonate deposition, of Permian age cemented with calcareous material. An eight percent porosity cut off is used to determine net pay as porosity less than eight percent is considered impermeable at the existing and proposed reservoir pressure and reservoir fluid regimes. Net pay isopach maps contained in the engineering report portion of the unit plan show the areal extent of the targeted sands. Impermeable carbonate deposits exist above and below the targeted sands thus defining the permeable limits of the reservoir. All injected fluids should remain in the reservoir with the exception of cycling to the surface though wellbores.

Based on communications with the New Mexico State Engineer's Roswell office (Ken Fresquez) and OCD files at Hobbs there appears to be only one fresh water well within T18S & R32E. This well's total depth was 270' and is located in the NW, NW, SE, SE, NW of section 20. The source strata tapped by this well is the Triassic "Red Beds" and the only other strata Mr. Fresquez referred to as potentially fresh was the Alluvium which is shallower than the "Red Beds". There are no known fresh water strata underlying the Bone Spring.

ITEMS IX THROUGH XII OF NEW MEXICO OCD FORM C-108
QUERECHO PLAINS BONE SPRING SAND UNIT

ITEM IX. This well has an existing fracture stimulation. It is anticipated that the well may need an acid clean up after re-entry.

ITEM X. All logging and test data for the existing wellbore exists on file with the state of New Mexico Oil Conservation Division (OCD) and will not be resubmitted with this application.

ITEM XI. As stated in ITEM VIII, it appears the only strata within one mile of our proposed injector which contains water of possible drinking quality is confined to 270' and shallower. No contamination of this drinking water should occur as all existing wellbores which penetrate the Bone Spring have surface casing set at a minimum depth of 350' with cement completely circulated behind this casing from setting depth to surface. In addition and to the best of my knowledge there are no fresh water wells within one mile of our proposed injectors.

ITEM XII. After reviewing the geology of the Bone Spring Sand strata in a one and one-half mile radius around the proposed unit area, no evidence appears of fractures or any hydrologic connection between the target sands and any overlying or underlying strata.

CAPROCK LABORATORIES, INC.
3312 BANKHEAD HIGHWAY
MIDLAND, TEXAS 79701
(915) 689 - 7252

May 21, 1992

Mewburne Oil Company
P. O. Box 7698
Tyler, Texas 75711

Attention: Kevin Mays

Subject: Water Compatibility Study

Gentlemen:

Presented in this report are the final results of a water compatibility study performed on 5 samples of produced water provided to this laboratory by Core Laboratory on behalf of Mewburne Oil Company. API Water Analysis was performed on each of the samples to determine their ionic characteristics. Based on these analyses, the scaling tendency with respect to cacium carbonate and calcium sufate were calculated and reported on May 19, 1992 (our Job Number 9205032). The samples were physically mixed to determine if precipitates would form. Turbidity was measured as percent transmittance on each of the combinations at 420 nanometers wavelength on a Milton Roy Model 601 Spectrophotometer.

The turbidity data are presented in this report and indicated ~~that~~ that the water from the Federal "E" #5 tank battery (Queen Formation) and the water from the Cedardrake Federal #4 well formed precipitates whe combined in the ratios tested (very slight decreaces in transmittance were observed). Additional analyses were performed on the waters to determine their barium concentrations and are also presented in this report. Based on calculations from theoretical combinations, all of the waters have a tendency to form both calcium carbonate and calcium sulfate scale on their own and these tendencies do not increase when mixed. The fresh water from Double Eagle and the Delaware produced water from the Cedardrake Federal #4 well both have barium and therefore presents the possibility of barium sulfate scale formation when combined with waters high in sulfate.

In conclusion, based on all of the analyses and physical combinations of these waters, the Delaware produced water from the Jewitt Feed #1 appears to be the most compatible water to the Bone Springs water from the Federal "L" lease.

Respectfully yours,

James L. Pritchard, Lab Manager
Caprock Laboratories, Inc.

CAPROCK LABORATORIES, INC.
3312 BANKHEAD HIGHWAY
MIDLAND, TEXAS 79701
(915) 689 - 7252

COMPANY: MEWBURNE OIL COMPANY JOB NUMBER: 9205032

SAMPLE NUMBER	SAMPLE DESCRIPTION
1	FEDERAL "E" #5 T.B. (QUEEN FORMATION)
2	JEWITT FEED #1 (DELAWARE FORMATION)
3	DOUBLE EAGLE (FRESH WATER)
4	CEDARDRAKE FEDERAL #4 (DELAWARE FORMATION)
5	FEDERAL "L" LEASE (BONE SPRINGS FORMATION)

MIXTURE	TURBITY, % TRANS. @ 420 uM
1-5	96.6
2-5	100.
3-5	100.
4-5	99.5
1-2-5	94.3
1-3-5	95.3
1-4-5	98.8
2-3-5	100.
2-4-5	98.8
3-4-5	99.7
ALL	97.7

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WATER ANALYSIS REPORT

SAMPLE

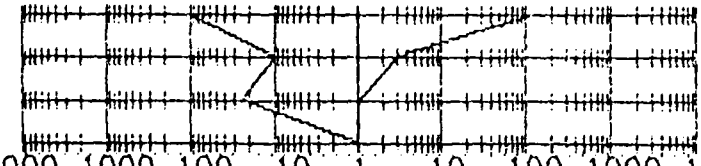
il Co. :
Lease : DOUBLE EAGLE
ell No.: FRESH WATER
Job No.: 9205032

Sample Loc. :
Date Sampled :
Attention :
Analysis No. : 3

ANALYSIS

		MG/L	EQ. WT.	*MEQ/L
1.	pH	9.100		
2.	Specific Gravity 60/60 F.	0.996		
3.	$CaCO_3$ Saturation Index @ 80 F.	+1.548		
	@ 140 F.	+2.388		
	Dissolved Gasses			
4.	Hydrogen Sulfide	0.0		
5.	Carbon Dioxide	Not Determined		
6.	Dissolved Oxygen	Not Determined		
	Cations			
7.	Calcium (Ca^{++})	200	/ 20.1 =	9.95
8.	Magnesium (Mg^{++})	304	/ 12.2 =	24.92
9.	Sodium (Na^{+}) (Calculated)	2,507	/ 23.0 =	109.00
10.	Barium (Ba^{++})	6	/ 68.7 =	0.09
	Anions			
11.	Hydroxyl (OH^{-})	0	/ 17.0 =	0.00
12.	Carbonate (CO_3^{--})	0	/ 30.0 =	0.00
13.	Bicarbonate (HCO_3^{-})	183	/ 61.1 =	3.00
14.	Sulfate (SO_4^{--})	50	/ 48.8 =	1.02
15.	Chloride (Cl^{-})	4,963	/ 35.5 =	139.80
16.	Total Dissolved Solids	8,213		
17.	Total Iron (Fe)	1	/ 18.2 =	0.05
18.	Total Hardness As $CaCO_3$	1,752		
19.	Resistivity @ 75 F. (Calculated)	0.685 /cm.		

LOGARITHMIC WATER PATTERN
*meq/L.



*Milli Equivalents per Liter

Calculated Calcium Sulfate solubility in this brine is 2,814 mg/L. at 90 F.

PROBABLE MINERAL COMPOSITION

COMPOUND	EQ. WT.	X *meq/L =	mg/L.
$Ca(HCO_3)_2$	81.04	3.00	243
$CaSO_4$	68.07	0.94	64
$CaCl_2$	55.50	6.02	334
$Mg(HCO_3)_2$	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	108.87	6,364

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WATER ANALYSIS REPORT

SAMPLE

Co. :	MEWBOURNE OIL CO.	Sample Loc. :	QUEEN PENCOSE PROD. WATER
Lease :	FEDERAL E	Date Sampled :	
ll No.:	#5 T.B.	Attention :	
ob No.:	9205032	Analysis No. :	1

ANALYSIS

		MG/L	EQ. WT.	*MEQ/L
1.	pH	6.100		
2.	Specific Gravity 60/60 F.	1.171		
3.	$CaCO_3$ Saturation Index @ 80 F.	+1.948		
	@ 140 F.	+2.648		
	Dissolved Gasses			
4.	Hydrogen Sulfide	0.0		
5.	Carbon Dioxide	Not Determined		
6.	Dissolved Oxygen	Not Determined		
	Cations			
7.	Calcium (Ca^{++})	8,978	/ 20.1 =	446.67
8.	Magnesium (Mg^{++})	8,266	/ 12.2 =	677.54
9.	Sodium (Na^{+}) (Calculated)	94,120	/ 23.0 =	4,092.17
10.	Barium (Ba^{++})	0.0		
	Anions			
11.	Hydroxyl (OH^{-})	0	/ 17.0 =	0.00
12.	Carbonate (CO_3^{--})	0	/ 30.0 =	0.00
13.	Bicarbonate (HCO_3^{-})	85	/ 61.1 =	1.39
14.	Sulfate (SO_4^{--})	1,950	/ 48.8 =	39.96
15.	Chloride (Cl^{-})	183,647	/ 35.5 =	5,173.15
16.	Total Dissolved Solids	297,046		
17.	Total Iron (Fe)	22	/ 18.2 =	1.21
18.	Total Hardness As $CaCO_3$	56,450		
19.	Resistivity @ 75 F. (Calculated)	0.001 /cm.	= .1 Ω/m	

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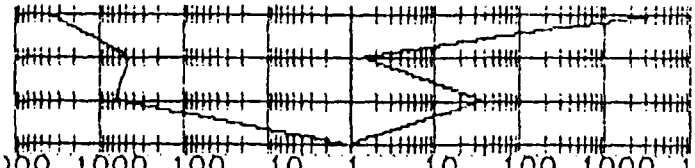
LOGARITHMIC WATER PATTERN

*meq/L.



*Milli Equivalents per Liter

Calculated Calcium Sulfate solubility in this brine is 1,232 mg/L. at 90 F.

PROBABLE MINERAL COMPOSITION

COMPOUND	EQ. WT.	X *meq/L =	mg/L.
$Ca(HCO_3)_2$	81.04	1.39	113
$CaSO_4$	68.07	39.96	2,720
$CaCl_2$	55.50	405.32	22,495
$Mg(HCO_3)_2$	73.17	0.00	0
$MgSO_4$	60.19	0.00	0
$MgCL_2$	47.62	677.54	32,265
$NaHCO_3$	84.00	0.00	0
$NaSO_4$	71.03	0.00	0
NaCl	58.46	4,090.30	239,119

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Marks and Comments:

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WATER ANALYSIS REPORT

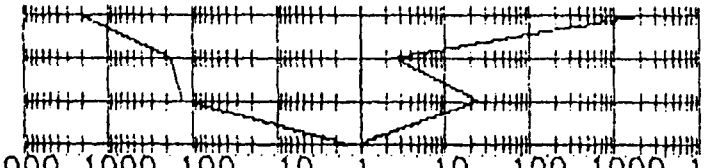
SAMPLE

l Co. :	MEWBOURNE OIL CO.	Sample Loc. :	BONE SPRINGS PROD. WATER
Lease :	FEDERAL L LEASE	Date Sampled :	
ell No.:		Attention :	
ob No.:	9205032	Analysis No. :	5

ANALYSIS

		MG/L	EQ. WT.	*MEQ/L
1.	pH	7.550 ✓		
2.	Specific Gravity 60/60 F.	1.110 ✓		
3.	$CaCO_3$ Saturation Index @ 80 F.	+0.842		
	@ 140 F.	+1.722		
	Dissolved Gasses			
4.	Hydrogen Sulfide	0.0		
5.	Carbon Dioxide	Not Determined		
6.	Dissolved Oxygen	Not Determined		
	Cations			
7.	Calcium (Ca^{++})	3,527 ✓	/ 20.1 =	175.47
8.	Magnesium (Mg^{++})	1,556	/ 12.2 =	127.54
9.	Sodium (Na^{+}) (Calculated)	52,547	/ 23.0 =	2,284.65
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^{-})	159	/ 61.1 =	2.60
14.	Sulfate (SO_4^{--})	1,300	/ 48.8 =	26.64
15.	Chloride (Cl^{-})	90,760 ✓	/ 35.5 =	2,556.62
16.	Total Dissolved Solids	149,849		
17.	Total Iron (Fe)	28	/ 18.2 =	1.51
18.	Total Hardness As $CaCO_3$	15,214		
19.	Resistivity @ 75 F. (Calculated)	0.037 /cm.		

LOGARITHMIC WATER PATTERN
*meq/L.



000 1000 100 10 1 10 100 1000 10000
*Milli Equivalents per Liter

Calculated Calcium Sulfate solubility in this brine is 4,032 mg/L. at 90 F.

PROBABLE MINERAL COMPOSITION

COMPOUND	EQ. WT.	X *meq/L =	mg/L.
$Ca(HCO_3)_2$	81.04	2.60	211
$CaSO_4$	68.07	26.64	1,813
$CaCl_2$	55.50	146.23	8,116
$Mg(HCO_3)_2$	73.17	0.00	0
$MgSO_4$	60.19	0.00	0
$MgCL_2$	47.62	127.54	6,074
$NaHCO_3$	84.00	0.00	0
$NaSO_4$	71.03	0.00	0
NaCl	58.46	2,282.85	133,455

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narks and Comments:

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WATER ANALYSIS REPORT

SAMPLE

il Co. :	MEWBOURNE OIL CO.	Sample Loc. :	DELAWARE PROD. WATER
Lease :	CEDARDRAKE FEDERAL	Date Sampled :	
ell No.:	#4	Attention :	
Job No.:	9205032	Analysis No. :	4

ANALYSIS

		MG/L	EQ. WT.	*MEQ/L
1.	pH	6.900		
2.	Specific Gravity 60/60 F.	1.148		
3.	$CaCO_3$ Saturation Index @ 80 F.	+0.668		
	@ 140 F.	+1.778		
	Dissolved Gasses			
4.	Hydrogen Sulfide	0.0		
5.	Carbon Dioxide	Not Determined		
6.	Dissolved Oxygen	Not Determined		
	Cations			
7.	Calcium (Ca^{++})	14,749	/ 20.1 =	733.78
8.	Magnesium (Mg^{++})	2,674	/ 12.2 =	219.18
9.	Sodium (Na^{+}) (Calculated)	49,932	/ 23.0 =	2,170.96
10.	Barium (Ba^{++})	22	/ 68.7 =	0.32
	Anions			
11.	Hydroxyl (OH^{-})	0	/ 17.0 =	0.00
12.	Carbonate (CO_3^{--})	0	/ 30.0 =	0.00
13.	Bicarbonate (HCO_3^{-})	49	/ 61.1 =	0.80
14.	Sulfate (SO_4^{--})	1,300	/ 48.8 =	26.64
15.	Chloride (Cl^{-})	109,904	/ 35.5 =	3,095.89
16.	Total Dissolved Solids	178,630		
17.	Total Iron (Fe)	18	/ 18.2 =	0.99
18.	Total Hardness As $CaCO_3$	47,843		
19.	Resistivity @ 75 F. (Calculated)	0.014 /cm.		

LOGARITHMIC WATER PATTERN

*meq/L.

*Milli Equivalents per Liter

Calculated Calcium Sulfate solubility in this brine is 1,111 mg/L. at 90 F.

PROBABLE MINERAL COMPOSITION

COMPOUND	EQ. WT.	X *meq/L =	mg/L.
$Ca(HCO_3)_2$	81.04	0.80	65
$CaSO_4$	68.07	26.32	1,792
$CaCl_2$	55.50	706.66	39,220
$Mg(HCO_3)_2$	73.17	0.00	0
$MgSO_4$	60.19	0.00	0
$MgCl_2$	47.62	219.18	10,437
$NaHCO_3$	84.00	0.00	0
$NaSO_4$	71.03	0.00	0
NaCl	58.46	2,170.05	126,861

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emarks and Comments:

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Midland, Texas 79701
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FAX # (915) 689-0130

WATER ANALYSIS REPORT

SAMPLE

Oil Co. : MANZANO OIL
Lease : JEWITT FEED
Well No.: #1
Job No.: 9205032

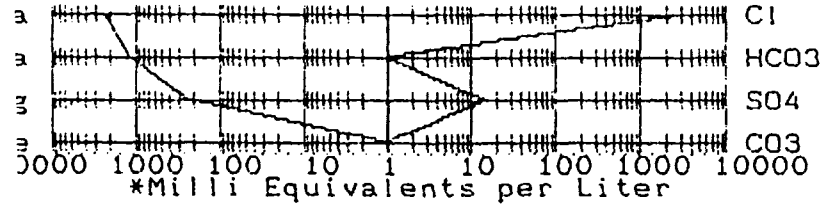
Sample Loc. : DELAWARE PROD.
Date Sampled :
Attention :
Analysis No. : 2

ANALYSIS

		MG/L	EQ. WT.	*MEQ/L
1.	pH	6.550		
2.	Specific Gravity 60/60 F.	1.165 ✓		
3.	$CaCO_3$ Saturation Index @ 80 F.	+1.052		
	@ 140 F.	+2.812		
	Dissolved Gasses			
4.	Hydrogen Sulfide	0.0		
5.	Carbon Dioxide	Not Determined		
6.	Dissolved Oxygen	Not Determined		
	Cations			
7.	Calcium (Ca^{++})	24,529 ✓	/ 20.1 =	1,220.35
8.	Magnesium (Mg^{++})	2,772	/ 12.2 =	227.21
9.	Sodium (Na^{+}) (Calculated)	52,982	/ 23.0 =	2,303.57
10.	Barium (Ba^{++})	0.0		
	Anions			
11.	Hydroxyl (OH^{-})	0	/ 17.0 =	0.00
12.	Carbonate (CO_3^{--})	0	/ 30.0 =	0.00
13.	Bicarbonate (HCO_3^{-})	61	/ 61.1 =	1.00
14.	Sulfate (SO_4^{--})	750	/ 48.8 =	15.37
15.	Chloride (Cl^{-})	132,594 ✓	/ 35.5 =	3,735.04
16.	Total Dissolved Solids	213,688		
17.	Total Iron (Fe)	15	/ 18.2 =	0.84
18.	Total Hardness As $CaCO_3$	72,665		
19.	Resistivity @ 75 F. (Calculated)	0.001 /cm.		

LOGARITHMIC WATER PATTERN

*meq/L.



*Milli Equivalents per Liter

Calculated Calcium Sulfate solubility in this brine is 590 mg/L. at 90 F.

PROBABLE MINERAL COMPOSITION

COMPOUND	EQ. WT.	X *meq/L =	mg/L.
$Ca(HCO_3)_2$	81.04	1.00	81
$CaSO_4$	68.07	15.37	1,046
$CaCl_2$	55.50	1,203.98	66,821
$Mg(HCO_3)_2$	73.17	0.00	0
$MgSO_4$	60.19	0.00	0
$MgCl_2$	47.62	227.21	10,820
$NaHCO_3$	84.00	0.00	0
$NaSO_4$	71.03	0.00	0
NaCl	58.46	2,303.85	134,683

alyst

marks and Comments:

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
HOBBS DISTRICT OFFICE

4/23/96

GOVERNOR

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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 _____
WFX X
PMX _____

Gentlemen:

I have examined the application for the:

Newbourne Oil Co Hanley 24 Federal #1-L 24-18s-32e
Operator Lease & Well No. Unit S-T-R

and my recommendations are as follows:

OK

Yours very truly,

Jerry Sexton
Supervisor, District 1

/ed