MEWBOURNE OIL COMPANY

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

May 5, 1994

New Mexico Oil Conservation Commission
P.O. Box 2088
State Land Office Building
Santa Fe, New Mexico 87504
Attn: Jim Morrow

Re: Case Nos. 10959 & 10960
Proposed Querecho Plains
Queen Associated Sand Unit
Lea County, New Mexico

Dear Mr. Morrow:

During the April 28, 1994 hearing for the referenced cases, you requested the total water volume injected into the Cavalcade No. 4 well, located in Unit P, Section 21. This volume as of December 31, 1993, was 88,208 barrels. The average injection rate for 1993 for this well was 66 bwpd.

I would also like to take this opportunity to provide additional input concerning the wellbores which do not have cement across the Queen Formation, both producing and plugged. Attached for your consideration is Division Order R-9737-A concerning the Querecho Plains Bone Spring Waterflood and a schematic of a plugged well within the area of review for that flood. Please be reminded the Bone Spring formation lies at a depth of approximately 8500'. It can be seen on the schematic there is 1810' between the cement plugs above and below the Bone Spring. There are other know porous strata within this 1810' which we are not injecting into. It can further be seen in the Division Order, Articles 5, 6 and 7, page 8, that all operations concerning wells with cement not covering the injection interval were referred to your Hobbs Office for further approval. Also, attached hereto are letters dated October 29, December 14, and January 10, containing correspondence between Mewbourne Oil and your Hobbs Office. It can be seen in these letters that no re-entry of plugged wells was required and monitoring of producers with temperature logs and surface casing pressure readings was acceptable. Again, as stated in our testimony, it is our opinion that the properties of the stagnant mud column will not allow fluids to leave the Queen formation considering our proposed operating pressures.

After posting all the plugged wells onto the Queen and Penrose isopach maps one can see eight of these wells lie outside the zero line (three have no net pay and five are in the water leg of the Queen Sand). The three wells with no pay are as follows, and will not see any fluid migration from our flood:

Cavalcade "21 Federal No. 5	Unit J	Section 21
Chessman 2-X	Unit A	Section 22
Superior Federal No. 1	Unit A	Section 33

The seven wellbores inside the zero line, and the five in the water leg of the Queen, exhibit the following characteristics:

The Edwards No. 1 is within the area of review of the already existing injector, Cavalcade No. 4. The Edwards required no re-entry before or since the Cavalcade has been injecting. The reasons for not requiring re-entry are discussed in Findings 8, 9, and 10 of Division Order R-9240. A copy of this order is attached for your convenience.

The Jewitt-McDonald No. 2 has cement completely isolating the Queen Formation.

The Hanley "24" Federal No. 1 has cement completely isolating the Queen Formation.

The Anadarko "26" No. 1 drilled to a total depth of 4124' and has a cement plug from 3942'-3842'. The top of the Queen is at 3942'. As a result, the only porous strata between TD and the cement plug is our proposed Unitized Queen.

The Anadarko 1-Y has 1600' of mud column between the cement plugs above and below the Queen. It is our opinion that the mud properties will either: 1) Not allow fluids to enter from the Queen due to hydrostatic overbalance, or 2) Mud particles will have settled out so as to not allow fluids to enter from the Queen, or 3) Mud filtrate will have formed on all permeable zones so as to not allow fluids to enter due to the pressure ranges we will be operating at. The weighted average pore pressure in the Queen and Penrose sands will not exceed 1600 psi during our waterflood. A 10 ppg mud with 25 lbs of gel per barrel, which is the standard required by your Hobbs Office , generates 2012 psi of hydrostatic at 3870'. The top of the Queen in the Anadarko 1-Y is 3870'. The only possible porous strata between the two cement plugs would be the Yates and Seven Rivers Formations. Neither of these Formations has produced in a one and one-half mile radius around the Anadarko 1-Y. As a result, no strata is depleted between the cement plugs and no strata is susceptible to "crossflow".

The Federal E No. 4 has the same characteristics as the Anadarko 1-Y with the exception of having only 650' of mud column between cement plugs.

The Anadarko Federal No. 5 has cement completely isolating the Queen Formation.

The Anadarko Federal No. 4 has cement completely isolating the Queen Formation.

The Anadarko Federal No. 6 has cement completely isolating the Queen Formation.

The Anadarko Federal No. 1 has cement completely isolating the Queen Formation.

The Nellie No. 1 has cement completely isolating the Queen Formation.

As stated in our testimony there are three wells producing from deeper formations which do not have cement covering the Queen. If one looks at the spreadsheet of mechanical detail they will actually see four wells meeting this criteria; however, the Burleson Federal No. 1 actually has a DV Tool set at 5986' and had 675 sx of class H 50/50 pozzolan cement circulated from that depth. This would conservatively raise the calculated top of cement to 3630' and cover the Queen. The three other wells testified to were the Murjo No. 1, Sprinkle No. 3, and Sprinkle No. 4. Again, we believe the properties of the mud column will not allow fluids to exit the Queen Formation and certainly agree to monitor this situation with temperature logging and monitoring of those casing annulus pressures at the surface. In that Santa Energy operates the Sprinkle No. 4 well, they were approached by telephone on May 9, 1994, to see if they were in concurrence with this monitoring. Mark Sundland, Senior Engineer in Santa Fe Energy's Midland office did confirm monitoring was preferred to remedial action.

We appreciate your consideration in all of these matters. If you have any questions please contact me or Ken Calvert at (903) 561-2900.

Sincerely,

Kevin Mayes

Kevin Mayes, P.E.
Project Engineer

cc: Ken Calvert
Kelly Ryan
Jim Bruce

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

Case No. 10762
Order No. R-9737-A

APPLICATION OF MEWBOURNE OIL COMPANY FOR A WATERFLOOD PROJECT AND QUALIFICATION FOR THE RECOVERED OIL TAX RATE, LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on July 1, 1993, at Santa Fe, New Mexico, before Examiner Michael E. Stogner.

NOW, on this 13th day of October, 1993, the Division Director having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS THAT:

(1) Due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.

(2) At the time of the hearing this case was consolidated with Division Case No. 10761 for the purpose of testimony.

(3) By Division Order No. R-9737, issued in Case No. 10497 and dated October 1, 1992, Mewbourne Oil Company was authorized to convert its Government "K" Well No. 2, located 1950 feet from the South line and 1980 feet from the West line (Unit K) of Section 23, and its Federal "E" Well No. 11, located 660 feet from the North line and 530 feet from the East line (Unit A) of Section 27, both in Township 18 South,

Range 32 East, NMPM, Lea County, New Mexico, into water injection wells for the purpose of testing the "injectivity" of the Querecho Plains-Upper Bone Spring Pool for a sufficient period of time to establish stabilized injection rates in order to determine the feasibility of commencing a waterflood project in this general area to be unitized at a later date.

(4) The applicant, Mewbourne Oil Company, at this time seeks authority to institute a waterflood project in its proposed Querecho Plains Bone Spring Sand Unit Area (Division Case No. 10761), Lea County, New Mexico, by the injection of water into the designated and Undesignated Querecho Plains-Upper Bone Spring Pool, as found in that stratigraphic interval between 8,328 feet to 8,620 feet as measured on the *Welex - Spectral Density Dual Spaced Neutron Log* ran on November 28, 1987 in the applicant's Federal Well No. 4 located 660 feet from the North line and 1650 feet from the East line (Unit B) of Section 23, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico, through fifteen certain wells to be converted from producing wells to injectors, as further described in Exhibit "A" attached hereto and made a part hereof.

(5) It is proposed that the waterflood project area coincide with the boundary of the Querecho Plains Bone Spring Sand Unit Area in Lea County, New Mexico, as further described below, which was the subject of Division Case No. 10761 and was heard in combination with this case:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM
Section 13: S/2 SW/4
Section 14: SE/4
Section 22: NE/4 SE/4 and S/2 SE/4
Section 23: All
Section 24: W/2 NW/4 and SW/4 SW/4
Section 26: N/2
Section 27: All
Section 28: E/2

(6) The above-described area contains several tracts of undeveloped acreage; therefore, in compliance with Division General Rule 701.G(1) the project area as requested should be reduced to include only those oil spacing and proration units within the proposed area that have experienced production from the Querecho Plains-Upper Bone Spring Pool, being the following described 2,040 acres in Lea County, New Mexico:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM
Section 13: SW/4 SW/4
Section 14: SE/4
Section 22: SE/4 SE/4
Section 23: NE/4, S/2 NW/4 and S/2
Section 24: W/2 NW/4 and SW/4 SW/4
Section 26: N/2 NE/4, SW/4 NE/4 and NW/4
Section 27: E/2 NE/4, SW/4 NE/4, SE/4 NW/4 and E/2 SW/4

(7) The present Upper Bone Spring oil producing wells within the subject project area are in an advanced state of depletion and should therefore be properly classified as "stripper wells".

(8) The results of the injectivity test approved by said Order No. R-9737 indicates that both of the test wells are capable of injection rates of 700 to 800 barrels of water per day at the maximum injection pressure of 1650 psi permitted by said Order No. R-9737. Further, injection surveys from both wells indicated that the injected waters remained confined to the Upper Bone Spring interval.

(9) The applicant further requests a surface limitation pressure in excess of the Division's guidelines of 0.2 psi per foot of depth, but not in excess of 2,000 psi surface pressure.

(10) In support of this request the applicant presented additional results from its injectivity tests, showing that the Delaware produced water utilized for injection had a gradient hydrostatic head of 0.51 psi per foot. While injecting this "heavy water" at the maximum 1650 psi (as permitted by Order R-9737) the total gradient hydrostatic head generated at depth was equal to 0.70 psi per foot. The applicant testified that the average formation fracture gradient for the Querecho Plains-Upper Bone Spring Pool is equal to 0.74 psi per foot as determined by the initial shut-in pressures from fracture stimulations which were performed on several wells in the general area. Injected waters to be utilized in this project initially will consist of fresh water to be purchased from the City of Carlsbad, New Mexico (approximately 90 percent of volume) with the remaining volume to be produced salt water from surrounding operators. The fluid gradient for this "less heavy" water is expected to be approximately 0.45 psi per foot. With a 2,000 psi pressure limit at the surface the total gradient hydrostatic head generated at depth calculates out at 0.69 psi per foot, which is below the fracture gradient for the pool.

(11) The increase in surface injection pressure as requested by the applicant is not expected to have an adverse effect on the unitized interval, further the proposed waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(12) The operator of the proposed Querecho Plains Bone Spring Sand Unit Waterflood Project should take all steps necessary to ensure that the injected water enters and remains confined to only the proposed injection interval (Upper Bone Spring zone) and is not permitted to escape from that interval and migrate into other formations, producing intervals, pools or onto the surface from injection, production, or plugged and abandoned wells.

(13) The previously plugged and abandoned BTA Oil Producers Cinco de Mayo Federal Well No. 1, the former Ralph Lowe Yates-Federal Well No. 1, located 660 feet from the North line and 1980 feet from the West line (Unit C) of Section 24, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico, is located within the one-half mile "area of review" of the proposed Federal "P" (water inject) Well No. 1, located 660 feet from the North and West lines (Unit D) of said Section 24.

Prior to commencement of injection into said Federal "P" Well No. 1, the operator should demonstrate to the satisfaction of the supervisor of the Division's District Office in Hobbs that the BTA Oil Producers Cinco de Mayo Federal Well No. 1, the former Ralph Lowe Yates-Federal Well No. 1, as described above, has been re-entered and replugged in such a manner as to ensure that it does not provide an avenue of escape for waters from the proposed injection interval.

(14) Likewise, the previously plugged and abandoned Lewis B. Burleson, Inc. Anadarko Federal Well No. 1, located 660 feet from the South line and 1980 feet from the West line (Unit N) of Section 27, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico, is located within the one-half mile "area of review" of the proposed Federal "E" (water inject) Well No. 10, located 2310 feet from the North and East lines (Unit G) of said Section 27.

Prior to commencement of injection into said Federal "E" Well No. 10, the operator should demonstrate to the satisfaction of the supervisor of the Division's District Office in Hobbs that the Lewis B. Burleson, Inc. Anadarko Federal Well No. 1, as described above, has either been re-entered and replugged or has previously been plugged and abandoned in such a manner as to ensure that it does not provide an avenue of escape for waters from the proposed injection interval of the Mewbourne well or that said wellbore will not otherwise serve for such escape.

(15) From the evidence presented at the hearing it appears the applicant's existing Federal "E" Well No. 1, located 660 feet from the North line and 1980 feet from the East line (Unit B) of Section 27, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico, which is also within this "area of review" and currently completed in and producing from the North Lusk-Morrow Gas Pool, is not cemented or completed in such a manner which will prevent the migration of fluid from the proposed injection zone.

Therefore, prior to commencing injection operations into the Federal "E" Well Nos. 10 and 11 located in Units "G" and "A", respectively, of said Section 27 the operator should demonstrate to the satisfaction of the supervisor of the Division's District Office in Hobbs that the Federal "E" Well No. 1, as described above, has either been recompleted or is shown to have been previously completed in such a manner as to ensure that they do not provide an avenue of escape for waters from the proposed injection interval of the Mewbourne Morrow gas well or that said wellbore will not otherwise serve for such escape.

(16) Sufficient evidence on the corrosive nature of the proposed injection fluid was submitted by the applicant to support its request to utilize "bare steel" tubing instead of internally plastic-coated tubing at this time.

(17) The injection of water into the proposed injection wells should be accomplished either through 2 3/8-inch or 2 7/8-inch steel tubing installed in a packer set within 100 feet of the uppermost injection perforation; the casing-tubing annulus should be filled with an inert fluid and a gauge or approved leak-detection device should be attached to the annulus in order to determine leakage in the casing, tubing or packer.

(18) Prior to commencing injection operations into the proposed injection wells, the casing in each well should be pressure tested throughout the interval from the surface down to the proposed packer setting depth, to assure the integrity of such casing.

(19) The injection wells or pressurization system for each well should be so equipped as to limit injection pressure at the wellhead to no more than 2,000 psi.

(20) Any further increase in the injection pressure limitation placed upon any well in the project area should only be approved after proper notice and hearing.

(21) The operator should give advance notification to the supervisor of the Hobbs District Office of the Division of the date and time of the installation of injection equipment and of the mechanical integrity pressure-tests in order that the same may be witnessed.

(22) The proposed waterflood project should be approved and the project should be governed by the provisions of Rule Nos. 701 through 708 of the Oil Conservation Division Rules and Regulations.

(23) The applicant further requests that the subject waterflood project be approved by the Division as a qualified "Enhanced Oil Recovery Project" pursuant to the "Enhanced Oil Recovery Act" (Laws 1992, Chapter 38, Sections 1 through 5).

(24) The evidence presented indicates that the subject waterflood project meets all the criteria for approval.

(25) The approved "project area" should initially comprise that area described in Finding Paragraph No. (6) above.

(26) To be eligible for the EOR credit, prior to commencing injection operations, the operator must request from the Division a Certificate of Qualification, which certificate will specify the proposed project area as described above.

(27) At such time as a positive production response occurs and within five years from the date of the Certificate of Qualification, the applicant must apply to the Division for certification of positive production response, which application shall identify the area actually benefitting from enhanced recovery operations, and identifying the specific wells which the operator believes are eligible for the credit. The Division may review the application administratively or set it for hearing. Based upon evidence presented, the Division will certify to the Department of Taxation and Revenue those lands and wells which are eligible for the credit.

(28) The injection authority granted herein for the proposed injection wells should terminate one year after the effective date of this order if the operator has not commenced injection operations into the subject wells, provided however, the Division, upon written request by the operator, may grant an extension thereof for good cause shown.

IT IS THEREFORE ORDERED THAT:

(1) The applicant, Mewbourne Oil Company, is hereby authorized to institute a waterflood project in its Querecho Plains Bone Spring Sand Unit Area (Division Case No. 10761), Lea County, New Mexico, by the injection of water into the designated and Undesignated Querecho Plains-Upper Bone Spring Pool (as found in that stratigraphic interval between 8,328 feet to 8,620 feet as measured on the *Welex - Spectral Density Dual Spaced Neutron Log* ran on November 28, 1987 in the applicant's Federal Well

No. 4 located 660 feet from the North line and 1650 feet from the East line (Unit B) of Section 23, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico) through fifteen certain wells to be converted from producing wells to injectors, as further described in Exhibit "A" attached hereto and made a part hereof.

(2) The waterflood project, hereby designated the Querecho Plains Bone Spring Sand Unit Waterflood Project, shall coincide with the boundary of the Querecho Plains Bone Spring Sand Unit Area, as further described below, and was the subject of Division Case No. 10761 which was heard in combination with this case:

QUERECHO PLAINS BONE SPRING SAND UNIT WATERFLOOD PROJECT
LEA COUNTY, NEW MEXICO

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM
Section 13: S/2 SW/4
Section 14: SE/4
Section 22: NE/4 SE/4 and S/2 SE/4
Section 23: All
Section 24: W/2 NW/4 and SW/4 SW/4
Section 26: N/2
Section 27: All
Section 28: E/2

(3) However, the initial waterflood project area, for allowable and tax credit purposes shall comprise only the following described 2040 acres in Lea County, New Mexico:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM
Section 13: SW/4 SW/4
Section 14: SE/4
Section 22: SE/4 SE/4
Section 23: NE/4, S/2 NW/4 and S/2
Section 24: W/2 NW/4 and SW/4 SW/4
Section 26: N/2 NE/4, SW/4 NE/4 and NW/4
Section 27: E/2 NE/4, SW/4 NE/4, SE/4 NW/4 and E/2 SW/4

(4) The applicant must take all steps necessary to ensure that the injected water only enters and remains confined to the proposed injection interval and is not permitted to escape to other formations or onto the surface from injection, production, or plugged and abandoned wells.

PROVIDED HOWEVER THAT:

(5) Injection into the Federal "P" Well No. 1, located 660 feet from the North and West lines (Unit D) of Section 24, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico, shall not commence until the previously plugged and abandoned BTA Oil Producers Cinco de Mayo Federal Well No. 1, the former Ralph Lowe Yates-Federal Well No. 1, located 660 feet from the North line and 1980 feet from the West line (Unit C) of said Section 24, has either been re-entered and replugged or is shown to have been adequately plugged and abandoned in a manner that ensures it does not provide an avenue of escape for waters from the proposed injection interval to the satisfaction of the Supervisor of the Division's District Office in Hobbs.

(6) FURTHER, injection into the Federal "E" Well No. 10, located 2310 feet from the North and East lines (Unit G) of Section 27, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico, shall not commence until the previously plugged and abandoned Lewis B. Burleson, Inc. Anadarko Federal Well No. 1, located 660 feet from the South line and 1980 feet from the West line (Unit N) of said Section 27, has either been re-entered and re-plugged or is shown to have been adequately plugged and abandoned in a manner that ensures it does not provide an avenue of escape for waters from the proposed injection interval to the satisfaction of the Supervisor of the Division's District Office in Hobbs.

(7) ALSO, injection into the Federal "E" Well Nos. 10 and 11 located in Units "G" and "A", respectively, of said Section 27, shall not commence until the applicant's Federal "E" Well No. 1, located 660 feet from the North line and 1980 feet from the East line (Unit B) of said Section 27, has either been recompleted or is shown to have been previously completed in such a manner as to ensure that they do not provide an avenue of escape for waters from the proposed injection interval to the satisfaction of the Supervisor of the Division's District Office in Hobbs.

IT IS FURTHER ORDERED THAT:

(8) Injection shall be accomplished through 2 3/8-inch or 2 7/8-inch bare steel tubing installed in a packer set approximately within 100 feet of the uppermost injection perforation; the casing-tubing annulus in each well shall be filled with an inert fluid and equipped with an approved pressure gauge or attention-attracting leak detection device.

(9) The injection wells or pressurization system for each injection well shall be so equipped as to limit injection pressure at the wellhead to no more than 2,000 psi.

(10) Any additional increase in the injection pressure limitation placed upon any well in the project area shall only be approved after proper notice and hearing.

(11) Prior to commencing injection operations, the casing in each injection well shall be pressure-tested throughout the interval from the surface down to the proposed packer setting depth, to assure the integrity of such casing.

(12) The operator shall give advance notification to the supervisor of the Hobbs District Office of the Division of the date and time of the installation of injection equipment and of the mechanical integrity pressure-test in order that the same may be witnessed.

(13) The applicant shall immediately notify the supervisor of the Hobbs District Office of the Division of the failure of the tubing, casing or packer in any of the injection wells, the leakage of water or oil from or around any producing well, or the leakage of water or oil from any plugged and abandoned well within the project area, and shall take such steps as may be timely and necessary to correct such failure or leakage.

(14) The applicant shall conduct injection operations in accordance with Division Rule Nos. 701 through 708 and shall submit monthly progress reports in accordance with Division Rule Nos. 706 and 1115.

FURTHERMORE:

(15) The subject waterflood project is hereby approved as an "Enhanced Oil Recovery Project" pursuant to the "Enhanced Oil Recovery Act" (Laws 1992, Chapter 38, Sections 1 through 5).

(16) The approved "project area" shall initially comprise that area described in Decretory Paragraph No. (3) above.

(17) To be eligible for the EOR credit, prior to commencing injection operations, the operator must request from the Division a Certificate of Qualification, which certificate will specify the proposed project area as described above.

(18) At such time as a positive production response occurs and within five years from the date of the Certificate of Qualification, the applicant must apply to the Division for certification of positive production response, which application shall identify the area actually benefitting from enhanced recovery operations, and identifying the specific wells

which the operator believes are eligible for the credit. The Division may review the application administratively or set it for hearing. Based upon evidence presented, the Division will certify to the Department of Taxation and Revenue those lands and wells which are eligible for the credit.

(19) The injection authority granted herein for the proposed injection wells shall terminate one year after the effective date of this order if the operator has not commenced injection operations into the subject wells, provided however, the Division, upon written request by the operator, may grant an extension thereof for good cause shown.

(20) Jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

WILLIAM J. LeMAY
Director

SEAL

EXHIBIT "A"

CASE NO. 10762
ORDER NO. R-9737-A

Mewbourne Oil Company

Proposed Injection Well Locations
Querecho Plains Bone Spring Sand Unit Waterflood Project Area
Township 18 South, Range 32 East, NMPM,
Lea County, New Mexico

Well Name and Number	Footage Location	Section	Unit	Proposed Injection Interval (Feet)
Santa Fe Energy Operating Partners, L.P. Shinnery "14" Federal Well No. 4	1980'FSL - 660'FEL	14	I	8412 - 8490
Santa Fe Energy Operating Partners, L.P. Shinnery "14" Federal Well No. 3	1980'FS & EL	14	J	8478 - 8504
Federal "L" Well No. 5	660' FN & EL	23	A	8430 - 8574
Federal "L" Well No. 4	660'FNL - 1650'FEL	23	B	8431 - 8506
Federal "L" Well No. 7	2310'FSL - 990'FEL	23	I	8485 - 8552
Federal "L" Well No. 2	2130'FSL - 2030'FEL	23	J	8458 - 8531
Government "K" Well No. 2	1950'FSL - 1980'FWL	23	K	8343 - 8515
Federal "F" Well No. 3	1980'FSL - 990'FWL	23	L	8362 - 8436
Federal "P" Well No. 1	660'FN & WL	24	D	8473 - 8545
Burleson Federal Well No. 2	660'FN & EL	26	A	8515 - 8584
Burleson Federal Well No. 1	660'FNL - 2310'FEL	26	B	8512 - 8572
Sprinkle Federal Well No. 2	660'FNL - 1980'FWL	26	C	8542 - 8574
Sprinkle Federal Well No. 1	660'FN & WL	26	D	8507 - 8532
Federal "E" Well No. 11	660'FNL - 530'FEL	27	A	8360 - 8388
Federal "E" Well No. 10	2310'FN & EL	27	G	8501 - 8530

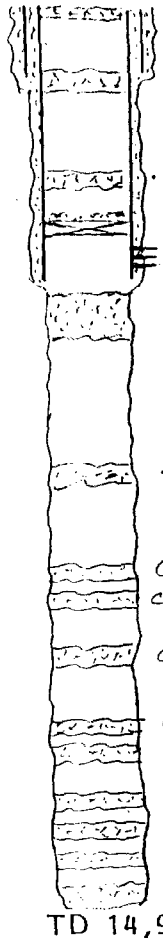
ITEM VI OF NEW MEXICO OCD FORM C-108

Plugged Well Detail

BTA (OPERATOR) — Cinco De Mayo Federal (LEASE)

1	660' FNL & 1980' FWL	24	18S	32E
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE

Schematic



Tabular Data

Surface Casing

Size 13-3/8" Cemented with 1050 sx.

TOC Surface feet determined by circ.

Hole size 16"

Intermediate Casing

Size 9-5/8" Cemented with 1500 sx.

TOC Surface feet determined by circ.

Hole size 10-3/4"

Long string

Size N.A." Cemented with _____ sx.

TOC _____ feet determined by _____

Hole size _____

Total depth 14,905'

Injection Interval

_____ feet to _____ feet

(perforated or open-hole, indicate which)

Tubing size _____ lined with _____ (material) set in a

_____ (brand and model) packer at _____ feet

(or describe any other casing-tubing seal).

Other Data

1. Name of the injection formation _____

2. Name of field or Pool (if applicable) _____

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

   If no, for what purpose was the well originally drilled? _____

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) _____

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

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
HOBBS DISTRICT OFFICE

BRUCE KING
GOVERNOR

October 29, 1993

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

Mewbourne Oil Company
P. O. Box 5270
Hobbs, New Mexico 88241-5270

Re: Division Order R-9737-A

Gentlemen:

According to the provisions of Division Order R-9737-A, the following wells were to be re-entered and replugged, or plugging confirmed to be adequate:

Cinco De Mayo Fed #1-C, Section 24, T18S, R32E

Anadarko Federal #1-N, Section 28, T18S, R32E

The additional information which you have submitted on these wells confirms that the original plugs and cement coverage is sufficient to comply with this order.

The Federal P Well No. 1 may be used for injection when the work has been completed and a pressure test has been conducted.

The Federal E Well No. 10 may be completed and used for injection purposes as soon as the Federal E #1 located in Unit B of Section 27, Township 18 South, Range 32 East has been re-completed or previous completion checked and approved.

Very truly yours

OIL CONSERVATION DIVISION

Jerry Sexton
Supervisor, District I

JS:bp

cc: David Catanach
File

MEWBOURNE OIL COMPANY

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

December 14, 1993

Via Overnight

New Mexico Oil Conservation Division
1000 W. Broadway
Hobbs, New Mexico 88240
Att: Jerry Sexton

Re: Finding No. 15 from NMOCD Order
No. R-9737-A
Completion Status of the Federal E No. 1
Querecho Plains Bone Spring Sand Unit
Lea County, New Mexico

Dear Mr. Sexton:

Enclosed is a copy of testimony given in Santa Fe including Exhibit 25 concerning the referenced topic. Also enclosed is a copy of the referenced Division Order and a technical paper concerning particle settling in mud columns in plug and abandon well bores.

These enclosures are sent in preparation for tentatively scheduled meetings between Kelly Ryan of our Hobbs office and you and I. Further, the enclosures are sent to support our belief that fluids will not enter the annular area of the E No. 1 due to our waterflood operations.

I very much look forward to meeting with you and discussing the referenced topic. Should you have any questions or comments, please contact me at (903) 561-2900 or Kelly Ryan at (505) 393-5905.

Sincerely yours,

Kevin Mayes

Kevin Mayes, P.E.
Project Engineer

KM/sh
Enclosures

MEWBOURNE OIL COMPANY

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

January 10, 1994

New Mexico Oil Conservation Division
P. O. Box 1980
Hobbs, New Mexico 88241-1980
Attn: Jerry Sexton

Re: Finding No. 15 from NMOCD
Order No. R-9737-A
Completion Status of the
Federal E No. 1

Dear Mr. Sexton:

At our meeting of December 16, 1993, it was discussed that the subject completion was adequate for keeping fluids from entering the subject wellbore due to our waterflood operations. It was further discussed that running a temperature log over the Bone Spring interval every two years was the best way to monitor and ensure that fluids do not enter the subject wellbore.

Enclosed for your consideration is a "base line" temperature log which was run shortly after our meeting. Evaluation of the log reveals no temperature anomalies throughout the Bone Spring interval.

If the enclosed log is to your satisfaction, we would appreciate you finding that the Federal E No. 1 wellbore is adequately completed for us to inject water into the Federal E No. 10 and E No. 11 wells.

If you have any questions or comments please contact me at (903) 561-2900.

Sincerely,

Kevin Mayes

Kevin Mayes, P.E.
Project Engineer

STATE OF NEW MEXICO
ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

CASE NO. 9972
Order No. R-9240

APPLICATION OF GARY L. BENNETT
FOR A PRESSURE MAINTENANCE
PROJECT, LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on June 27, 1990, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 31st day of July, 1990, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS THAT:

(1) Due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.

(2) The applicant, Gary L. Bennett, seeks authority to institute a pressure maintenance project on its Cavalcade Federal "21" Lease comprising the E/2 SW/4 and SE/4 of Section 21, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico, by the injection of water into the Querecho Plains-Queen Associated Pool through the perforated interval from approximately 4088 feet to 4130 feet in its Cavalcade Federal "21" Well No. 4 located 400 feet from the South line and 660 feet from the East line (Unit P) of said Section 21.

(3) The applicant proposes to maintain reservoir pressure in the Querecho Plains-Queen Associated Pool by the injection of water into the Penrose member of the Queen formation within the wellbore of its Cavalcade Federal "21" Well No. 4 as described above.

(4) The proposed pressure maintenance project should result in the recovery of otherwise unrecoverable oil from the Querecho Plains-Queen Associated Pool, thereby preventing waste.

(5) The operator should take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface.

(6) The evidence presented indicates that within the proposed injection well's area of review, there are two wells which may not be adequately cemented or plugged back in a manner adequate to confine the injected fluid to the proposed injection zone, these being the Cavalcade Federal "21" Well Nos. 1 and 3 located, respectively, 660 feet from the South line and 1650 feet from the East line (Unit O), and 1980 feet from the South line and 660 feet from the East line (Unit I), both in said Section 21.

(7) Prior to commencing injection operations, the applicant should be required to perform remedial cement operations and remedial plug back operations on the wells described in Finding No. (6) above in a manner satisfactory to the supervisor of the Division's Hobbs district office.

(8) In addition, the evidence presented indicates that within the SW/4 SW/4 of Section 22, Township 18 South, Range 32 East, NMPM, there apparently exists a plugged and abandoned well of which the Division has no records, and it is unknown whether such well has been plugged in a manner which will prevent the migration of fluid from the injection formation.

Bennett 7-24

(9) The applicant currently operates an additional Queen producing well, the Federal "Q" Well No. 4 located 660 feet from the South line and 710 feet from the West line (Unit M) of said Section 22 which is located in close proximity to said plugged and abandoned well.

(10) The applicant should not be required to re-enter and replug said well at this time, provided however, that the applicant should be required, as long as pressure maintenance operations are being conducted, to produce its Federal "Q" Well No. 4 so as to draw down the pressure in the Queen formation.

(11) Injection into the proposed injection well should be accomplished through 2 3/8-inch internally plastic-lined tubing installed in a packer set approximately within 100 feet of the uppermost injection perforation; the casing-tubing annulus should be filled with an inert fluid and a gauge or approved leak detection device should be attached to the annulus in order to determine leakage in the casing, tubing or packer.

(12) The injection well or system should be equipped with a pressure control device or acceptable substitute which will limit the surface injection pressure to no more than 817 psi.

(13) The Division Director should have the authority to administratively authorize a pressure limitation in excess of the above upon a showing by the operator that such higher pressure will not result in migration of waters from the Querecho Plains-Queen Associated Pool.

(14) Prior to commencing injection operations into the proposed injection well, the casing should be pressure tested throughout the interval from the surface down to the proposed packer setting depth, to assure the integrity of such casing.

(15) The operator should give advance notification to the supervisor of the Hobbs district office of the Division of the date and time of the installation of injection equipment, of the mechanical integrity pressure test, and of the conductance of any remedial cement or plug back operations in order that the same may be witnessed.

(16) The project allowable should be equal to top unit allowable for the Querecho Plains-Queen Associated Pool times the number of developed (production or injection) proration units within the project area.

(17) The project should be designated the Cavalcade Queen Pressure Maintenance Project.

(18) The application should be approved and the project should be governed by the provisions of Rules 701 through 708 of the Oil Conservation Division Rules and Regulations.

IT IS THEREFORE ORDERED THAT:

(1) The applicant, Gary L. Bennett, is hereby authorized to institute a pressure maintenance project on its Cavalcade Federal "21" Lease comprising the E/2 SW/4 and SE/4 of Section 21, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico, by the injection of water into the Querecho Plains-Queen Associated Pool through the perforated interval from approximately 4088 feet to 4130 feet in its Cavalcade Federal "21" Well No. 4 located 400 feet from the South line and 660 feet from the East line (Unit P) of said Section 21.

(2) The project is hereby designated the Cavalcade Queen Pressure Maintenance Project.

(3) The project allowable shall be equal to top unit allowable for the Querecho Plains-Queen Associated Pool times the number of developed (production or injection) proration units within the project area.

(4) Prior to commencing injection operations, the applicant shall be required to perform remedial cement operations and remedial plug back operations on the Cavalcade Federal "21" Well Nos. 1 and 3 located, respectively, 660 feet from the South line and 1650 feet from the East line (Unit O), and 1980 feet from the South line and 660 feet from the East line (Unit I), both in said Section 21, in a manner satisfactory to the supervisor of the Division's Hobbs district office.

(5) The applicant shall further be required, as long as pressure maintenance operations are being conducted, to produce its Federal "Q" Well No. 4, described in Finding No. (9) above, so as to draw down the pressure in the Queen formation.

(6) The operator shall take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface.

(7) Injection into the proposed injection well shall be accomplished through 2 3/8-inch internally plastic-lined tubing installed in a packer set approximately within 100 feet of the uppermost injection perforation; the casing-tubing annulus shall be filled with an inert fluid and a gauge or approved leak detection device shall be attached to the annulus in order to determine leakage in the casing, tubing or packer.

(8) The injection well or system shall be equipped with a pressure control device or acceptable substitute which will limit the surface injection pressure to no more than 817 psi.

(9) The Division Director shall have the authority to administratively authorize a pressure limitation in excess of the above upon a showing by the operator that such higher pressure will not result in migration of waters from the Querecho Plains-Queen Associated Pool.

(10) Prior to commencing injection operations into the injection well, the casing shall be pressure tested throughout the interval from the surface down to the proposed packer setting depth, to assure the integrity of such casing.

(11) The operator shall give advance notification to the supervisor of the Hobbs district office of the Division of the date and time of the installation of injection equipment, of the mechanical integrity pressure test, and of the conductance of any remedial cement or plug back operations in order that the same may be witnessed.

(12) The operator shall immediately notify the supervisor of the Division's Hobbs district office of the failure of the tubing, casing, or packer in the injection well, the leakage of water or oil from or around any producing well, or the leakage of water or oil from or around any plugged and abandoned well within the project area and shall take such steps as may be timely and necessary to correct such failure or leakage.

(13) The applicant shall conduct injection operations in accordance with Division Rule Nos. 701 through 708 and shall submit monthly progress reports in accordance with Division Rule Nos. 706 and 1115.

(14) Jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

WILLIAM J. LEMAY
Director

S E A L

Proposed Advertisement

Case 10960 : Application of Mewbourne Oil Company for approval of a waterflood project and qualification for the recovered oil tax rate, Lea County, New Mexico. Applicant seeks approval of its Querecho Plains Queen Associated Sand Waterflood Project by injection of water into the Querecho Plains - Queen Associated Pool at pressures in excess of 0.2 psi per foot of depth through 10 injection wells located in Township 18 South, Range 32 East as follows: Section 21: S½SE¼; Section 22: S½; Section 23: S½NW¼, S½; Section 26: N½N½; Section 27: N½, N½SW¼; and Section 28: N½NE¼, SE¼NE¼, and NE¼SE¼. The applicant requests that the Division establish procedures for the administrative approval of additional injection wells within said area without the necessity of further hearings and the adoption of any provisions necessary for such other matters as may be appropriate for said waterflood operations. Applicant further seeks to qualify this project for the recovered oil tax rate under the "Enhanced Oil Recovery Act" (Laws 1992, Chapter 38, Sections 1 through 5). Said area of interest is centered approximately 8 miles south of Maljamar, New Mexico.

APR 4 1994

JGB5\93A17.d

OIL CONSERVATION DIVISION
ARTESIA, NEW MEX. 88210

TO: David Catanach

FROM: Jim Morrow

DATE: 6-2-94

NUMBER OF SHEETS (INCLUDING TRANSMITTAL SHEET) 4

IF YOU HAVE ANY PROBLEMS WITH THIS TRANSMISSION, PLEASE CALL 505-748-1283.

FAX NUMBER (505) 748-9720

David - Here is some stuff from a similar well in the Meunbourne area where temp logs were approved to monitor an incremented well offsetting injection

(15) From the evidence presented at the hearing it appears the applicant's existing Federal "E" Well No. 1, located 660 feet from the North line and 1980 feet from the East line (Unit B) of Section 27, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico, which is also within this "area of review" and currently completed in and producing from the North Lusk-Morrow Gas Pool, is not cemented or completed in such a manner which will prevent the migration of fluid from the proposed injection zone.

Therefore, prior to commencing injection operations into the Federal "E" Well Nos. 10 and 11 located in Units "G" and "A", respectively, of said Section 27 the operator should demonstrate to the satisfaction of the supervisor of the Division's District Office in Hobbs that the Federal "E" Well No. 1, as described above, has either been recompleted or is shown to have been previously completed in such a manner as to ensure that they do not provide an avenue of escape for waters from the proposed injection interval of the Mewbourne Morrow gas well or that said wellbore will not otherwise serve for such escape.

(16) Sufficient evidence on the corrosive nature of the proposed injection fluid was submitted by the applicant to support its request to utilize "bare steel" tubing instead of internally plastic-coated tubing at this time.

(17) The injection of water into the proposed injection wells should be accomplished either through 2 3/8-inch or 2 7/8-inch steel tubing installed in a packer set within 100 feet of the uppermost injection perforation; the casing-tubing annulus should be filled with an inert fluid and a gauge or approved leak-detection device should be attached to the annulus in order to determine leakage in the casing, tubing or packer.

(18) Prior to commencing injection operations into the proposed injection wells, the casing in each well should be pressure tested throughout the interval from the surface down to the proposed packer setting depth, to assure the integrity of such casing.

(19) The injection wells or pressurization system for each well should be so equipped as to limit injection pressure at the wellhead to no more than 2,000 psi.

(20) Any further increase in the injection pressure limitation placed upon any well in the project area should only be approved after proper notice and hearing.

(21) The operator should give advance notification to the supervisor of the Hobbs District Office of the Division of the date and time of the installation of injection equipment and of the mechanical integrity pressure-tests in order that the same may be witnessed.

PROVIDED HOWEVER THAT:

(5) Injection into the Federal "P" Well No. 1, located 660 feet from the North and West lines (Unit D) of Section 24, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico, shall not commence until the previously plugged and abandoned BTA Oil Producers Cinco de Mayo Federal Well No. 1, the former Ralph Lowe Yates-Federal Well No. 1, located 660 feet from the North line and 1980 feet from the West line (Unit C) of said Section 24, has either been re-entered and replugged or is shown to have been adequately plugged and abandoned in a manner that ensures it does not provide an avenue of escape for waters from the proposed injection interval to the satisfaction of the Supervisor of the Division's District Office in Hobbs.

(6) FURTHER, injection into the Federal "E" Well No. 10, located 2310 feet from the North and East lines (Unit G) of Section 27, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico, shall not commence until the previously plugged and abandoned Lewis B. Burleson, Inc. Anadarko Federal Well No. 1, located 660 feet from the South line and 1980 feet from the West line (Unit N) of said Section 27, has either been re-entered and re-plugged or is shown to have been adequately plugged and abandoned in a manner that ensures it does not provide an avenue of escape for waters from the proposed injection interval to the satisfaction of the Supervisor of the Division's District Office in Hobbs.

(7) ALSO, injection into the Federal "E" Well Nos. 10 and 11 located in Units "G" and "A", respectively, of said Section 27, shall not commence until the applicant's Federal "E" Well No. 1, located 660 feet from the North line and 1980 feet from the East line (Unit B) of said Section 27, has either been recompleted or is shown to have been previously completed in such a manner as to ensure that they do not provide an avenue of escape for waters from the proposed injection interval to the satisfaction of the Supervisor of the Division's District Office in Hobbs.

IT IS FURTHER ORDERED THAT:

(8) Injection shall be accomplished through 2 3/8-inch or 2 7/8-inch bare steel tubing installed in a packer set approximately within 100 feet of the uppermost injection perforation; the casing-tubing annulus in each well shall be filled with an inert fluid and equipped with an approved pressure gauge or attention-attracting leak detection device.

(9) The injection wells or pressurization system for each injection well shall be so equipped as to limit injection pressure at the wellhead to no more than 2,000 psi.

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

January 10, 1994

New Mexico Oil Conservation Division
P. O. Box 1980
Hobbs, New Mexico 88241-1980
Attn: Jerry Sexton

Re: Finding No. 15 from NMOCD
Order No. R-9737-A
Completion Status of the
Federal E No. 1

Dear Mr. Sexton:

At our meeting of December 16, 1993, it was discussed that the subject completion was adequate for keeping fluids from entering the subject wellbore due to our waterflood operations. It was further discussed that running a temperature log over the Bone Spring interval every two years was the best way to monitor and ensure that fluids do not enter the subject wellbore.

Enclosed for your consideration is a "base line" temperature log which was run shortly after our meeting. Evaluation of the log reveals no temperature anomalies throughout the Bone Spring interval.

If the enclosed log is to your satisfaction, we would appreciate you finding that the Federal E No. 1 wellbore is adequately completed for us to inject water into the Federal E No. 10 and E No. 11 wells.

If you have any questions or comments please contact me at (903) 561-2900.

Sincerely,

Kevin Mayes

Kevin Mayes, P.E.
Project Engineer

OIL CONSERVATION DIVISION
ARTESIA, NEW MEX. 88210

TO: Anna Griego

FROM: Jim Morrow

DATE: 5-27-94

NUMBER OF SHEETS (INCLUDING TRANSMITTAL SHEET) 9

IF YOU HAVE ANY PROBLEMS WITH THIS TRANSMISSION, PLEASE CALL 505-748-1283.

FAX NUMBER (505) 748-9720

Anna - Thanks for the quick work. Please circulate the order after making the corrections. Thanks Jim

interval between 3886 feet to 4222 feet as measured on the *Welex - Compensated Acoustic Velocity Log* run on July 15, 1983 in the applicant's Federal Well No. 7 located 330 feet from the North line and 990 feet from the East line (Unit A) of Section 27, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico, through ten certain wells as further described in Exhibit "A" attached hereto and made a part hereof.

(4) It is proposed that the waterflood project area coincide with the boundary of the Querecho Plains Queen Associated Sand Unit Area in Lea County, New Mexico, as further described below, which was the subject of Division Case No. 10959 and was heard in combination with this case:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM

Section 21:	S/2 SE/4
Section 22	S/2
Section 23:	S/2 and S/2 NW/4
Section 26:	N/2 N/2
Section 27	N/2 and N/2 SW/4
Section 28:	NE/4 SE/4, N/2 NE/4, AND SE/4 NE/4

(5) The above-described area contains several tracts of undeveloped acreage; therefore, in compliance with Division General Rule 701.G(1) the project area as requested should be reduced to include only those oil spacing and proration units within the proposed area that have experienced production from the Querecho Plains-Queen Associated Pool. The S/2 SE/4 of Section 21 should also be removed from the project area because of the reasons explained in Finding Paragraph No. 20 of this order. The resulting project area should contain the following described 1000 acres in Lea County, New Mexico:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM

Section 22	S/2
Section 23:	SW/4, S/2 NW/4 and NE/4 SE/4
Section 26:	NW/4 NW/4
Section 27	N/2 NE/4, SE/4 NE/4, S/2 NW/4, E/4 NW/4 and N/2 SW/4
Section 28:	SE/4 NE/4

(6) The present Queen Associated oil producing wells within the subject project area and interval are in an advanced state of depletion and should therefore be properly classified as "stripper wells".

(7) The applicant requested that maximum surface injection pressure be set at 1400 psi. In support of this request, the applicant's witness used initial shut-in pressure and fluid gradients from the fracture treatments of seventeen wells in the pool to support testimony that 1400 psi surface injection pressure would not cause fracture pressure to be exceeded in the Queen-Penrose interval.

(8) The increase in surface injection pressure as requested by the applicant is not expected to have an adverse effect on the unitized interval, further the proposed waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(9) The operator of the proposed Querecho Plains Queen Associated Sand Unit Waterflood Project should take all steps necessary to ensure that the injected water enters and remains confined to only the proposed injection interval and is not permitted to escape from that interval and migrate into other

formations, producing intervals, pools or onto the surface from injection, production, or plugged and abandoned wells.

(10) The applicant submitted data concerning all plugged and producing wells within the area of review. Five plugged ~~and~~ wells are not so plugged as to isolate the Queen-Penrose waterflood interval. Three of the wells are located outside the zero contour lines of the Queen and Penrose isopach maps. The other two wells are located near planned waterflood producers which should keep the pressure drawn down in the formation. The operator should not be required to re-plug the two wells as long as the two nearby producers continue producing. The wells involved are described as follows:

Plugged Wells: Oil Associates, Inc.
Edwards Well No. 1
660' FSL & 660' FWL (Unit M), Section 22;

H & S Oil Company
Anadarko Well No. 1-Y
1980' FNL & 1995' FWL (Unit F), Section 27;

Producing Wells: Anadarko Petroleum Company
Bennett Federal "Q" Well No. 4
660' FSL & 710' FWL (Unit M), Section 22;

Mewbourne Oil Company
Federal "E" Well No. 2
2310' FNL & 1980' FWL (Unit F), Section 27.

(11) Three deep producing wells in the area of review do not have cement covering the Queen-Penrose. The wells are listed

below. The applicant has agreed to run temperature logs and to monitor surface casing pressure between the intermediate and production casing in these three wells. Re-cementing of these wells should not be required unless pressure problems develop.

Mewbourne Oil Company
Murjo Federal Well No. 1
1850' FNL & 990' FWL (Unit E), Section 23;

Mewbourne Oil Company
Sprinkle Federal Well No. 3
2310' FNL & 330' FWL (Unit E), Section 26; and

Santa Fe Energy Company
Sprinkle Federal Well No. 4
2310' FNL & 1650' FWL (Unit F), Section 26.

(12) Sufficient evidence on the corrosive nature of the proposed injection fluid was submitted by the applicant to support its request to utilize "bare steel" tubing instead of internally plastic-coated tubing at this time.

(13) The injection of water into the proposed injection wells should be accomplished either through 2 3/8-inch or 2 7/8-inch steel tubing installed in a packer set within 100 feet of the uppermost injection perforation; the casing-tubing annulus should be filled with an inert fluid and a gauge or approved leak-detection device should be attached to the annulus in order to determine leakage in the casing, tubing or packer.

(14) Prior to commencing injection operations into the proposed injection wells, the casing in each well should be

believes are eligible for the credit. The Division may review the application administratively or set it for hearing. Based upon evidence presented, the Division will certify to the Department of Taxation and Revenue those lands and wells which are eligible for the credit.

(25) The project is expected to cost $592,000 and recover an additional 220,000 barrels of oil.

(26) The applicant requested special operating rules for the unit which would provide for administrative approval of unorthodox locations and injection wells. Division General Rule 104.F(1) and 701.G currently provide for the administrative procedures, therefore the special rules are not needed.

(27) The injection authority granted herein for the proposed injection wells should terminate one year after the effective date of this order if the operator has not commenced injection operations into the subject wells, provided however, the Division, upon written request by the operator, may grant an extension thereof for good cause shown.

IT IS THEREFORE ORDERED THAT:

(1) The applicant, Mewbourne Oil Company, is hereby authorized to institute a waterflood project in its Querecho Plains Queen Associated Sand Unit Area (Division Case No. 10959), Lea County, New Mexico, by the injection of water into the Querecho Plains-Queen Associated Pool (as found in that stratigraphic interval between 3886 feet to 4222 feet as measured on the *Welex - Compensated Acoustic Velocity Log* ~~ran~~ RUN on July 15, 1983 in the applicant's Federal "E" Well No. 7 located 330 feet from the North

line and 990 feet from the East line (Unit A) of Section 27, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico) through ten certain wells as further described in Exhibit "A" attached hereto and made a part hereof.

(2) The waterflood project, hereby designated the Querecho Plains Queen Associated Sand Unit Waterflood Project, shall coincide with the boundary of the Querecho Plains Queen Associated Sand Unit Area, as further described below, which was the subject of Division Case No. 10959 heard in combination with this case:

QUERECHO PLAINS QUEEN ASSOCIATED SAND UNIT WATERFLOOD PROJECT
LEA COUNTY, NEW MEXICO

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM
Section 21: S/2 SE/4
Section 22 S/2
Section 23: S/2 and S/2 NW/4
Section 26: N/2 N/2
Section 27 N/2 and N/2 SW/4
Section 28: NE/4 SE/4, N/2 NE/4, AND SE/4 NE/4

(3) However, the initial waterflood project area, for allowable and tax credit purposes shall comprise only the following described 1000 acres in Lea County, New Mexico:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM
Section 22 S/2
Section 23: SW/4, S/2 NW/4 and NE/4 SE/4
Section 26: NW/4 NW/4
Section 27 N/2 NE/4, SE/4 NE/4, S/2 NW/4, NE/4 NW/4 and

N/2 SW/4
Section 28: SE/4 NE/4

(4) The applicant must take all steps necessary to ensure that the injected water only enters and remains confined to the proposed injection interval and is not permitted to escape to other formations or onto the surface from injection, production, or plugged and abandoned wells.

PROVIDED HOWEVER THAT:

(5) The applicant shall be required, as long as waterflood operations are being conducted, to produce its Bennett Federal "Q" Well No. 4 and Anadarko Well No. 1-Y, as described in Finding Paragraph No. (10) above, so as to draw down the pressure in the Queen formation.

(6) In addition, so long as waterflood operations are being conducted, the applicant shall be required to monitor casing pressures on a monthly basis in its Murjo Federal Well No. 1, ~~and~~ Santa Fe Energy's Sprinkle Federal Well No. its Sprinkle Federal Well No~~s~~. 3 and 4 as described in Finding Paragraph No. (11) above and shall report any observed pressures to the Hobbs District Office of the Division. Also, temperature surveys shall be run in the wells annually and reported to the Hobbs office. This monitoring shall determine if re-cementing is necessary.

IT IS FURTHER ORDERED THAT:

(7) Injection shall be accomplished through 2 3/8-inch or 2 7/8-inch bare steel tubing installed in a packer set approximately within 100 feet of the uppermost injection perforation; the casing-

EXHIBIT "A"

CASE NO. 10960
ORDER NO. R-_____

Mewbourne Oil Company

Proposed Injection Well Locations
Querecho Plains Queen Associated Sand Unit
Waterflood Project Area

Township 18 South, Range 32 East, NMPM,
Lea County, New Mexico

Well Name and Number	Footage Location	Section	Unit	Proposed Injection Interval (Feet)
Cavalcade Federal Well No. 4	400' FSL & 660' FEL	21	P	4096 - 4130
Bennett Federal Well No. 1	660' FSL & 1650' FEL	22	O	3879 ~~4097~~ - 4138
Flip Federal Well No. 1	1650' FNL & 330' FWL	23	E	4143 - 4150
Edith Federal Well No. 2	1980' FSL & 1980' FEL	23	J	3953 - 4224
Marshall Federal Well No. 1	660' FSL & 1980' FWL	23	N	4176 - 4190
Walker Federal Well No. 1	330' FNL & 330' FWL	26	D	3914 - 3947
Federal "E" Well No. 8	1650' FNL & 660' FEL	27	H	3934 - 4198
Anadarko Federal Well No. 2	1650' FSL & 1980' FWL	27	K	3888 - 4026
Anadarko Federal Well No. 3	1650' FSL & 990' FWL	27	L	3830 - 4060
Federal "E" Well No. 9	1980' FNL & 330' FEL	28	H	3875 ~~3975~~ - 4152

HINKLE, COX, EATON, COFFIELD & HENSLEY

ATTORNEYS AT LAW

218 MONTEZUMA

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SANTA FE, NEW MEXICO 87504-2068

(505) 982-4554

FAX (505) 982-8623

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CONRAD E. COFFIELD
HAROLD L. HENSLEY, JR.
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ROBERT P. TINNIN, JR.
MARSHALL G. MARTIN
MASTON C. COURTNEY*†
DON L. PATTERSON*†
DOUGLAS L. LUNSFORD
NICHOLAS J. NOEDING
T. CALDER EZZELL, JR.
WILLIAM B. BURFORD*
RICHARD E. OLSON
RICHARD R. WILFONG*
THOMAS J. McBRIDE
JAMES J. WECHSLER
NANCY S. CUSACK
JEFFREY L. FORNACIARI
JEFFREY D. HEWETT
JAMES BRUCE
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July 8, 1994

HAND DELIVERED

JUL 8 1994

William LeMay
Oil Conservation Division
State Land Office Building
Santa Fe, New Mexico 87501

Re: **Case No. 10960; Application of Mewbourne Oil Company for Approval of a Waterflood Project (Querecho Plains Queen Unit), Lea County, New Mexico**

Dear Mr. LeMay:

I understand that concerns have been raised regarding proposed operations for the above waterflood project. If you have any detailed questions, please call Kevin Mayes at Mewbourne in Tyler, Texas, (903) 561-2900.

I do not know the specific objections which were raised, but I would like to mention several issues that arose during hearing.

1. Unlined Tubing: Mewbourne requested unlined tubing. Unlined tubing was approved for Mewbourne's Querecho Plains Bone Spring Unit, which underlies the Queen Unit (See Order No. R-9737-A). Corrosion tests on Bone Spring Unit wells indicate negligible corrosion. Mr. Mayes testified to this at hearing. Due to the short life of the Queen Unit, unlined tubing will cause no problems.

2. Injection Pressures: Mewbourne requested permission to inject at pressures in excess of 0.2 psi/ft. Frac gradient data was presented at the hearing, see Exhibit 25, which indicates no problems. Also, injection pressures in excess of 0.2 psi/ft. were authorized in the underlying Bone Spring Unit. No problems have arisen.

3. Well Cementing: Certain wells do not have cement across the Queen formation. These wells were discussed at the hearing by Mr. Mayes, and he also provided the attached letter dated May 5, 1994 to the hearing examiner. In addition, these matters were discussed in detail in testimony for Case No. 10762, regarding the underlying Bone Spring Unit, and Order No. R-9737-A addressed certain wells. Mewbourne believes its proposal to monitor the wells is reasonable.

The working interest owners are anxious to commence injection, and, thus, your attention to this matter is appreciated. If I can provide you with any further information, please let me know.

Very truly yours,

HINKLE, COX, EATON, COFFIELD
& HENSLEY

James Bruce

Enclosure

JGB/sp

Recommendations:

Oil Associates, Inc. Edwards Well No. 1 M-22-18S-32E
This well should be replugged.

H & S Oil Company Anadarko No. 1-Y F-27-18S-32E
This well should be replugged.

Maljamar Oil & Gas Jewett-McDonald No. 2 E-23-18S-32E
Applicant states that Queen is isolated with plug 4054'-4105'
Could not find well file to verify top of Queen, however, offset well to east, Cedar Lake No. 1, reports top of Queen at 3909 feet and is producing from Queen at 3927. Need log for this well and geologist to pick top of Queen to make an informed decision on whether to replug or not.

The other PA'd wells which Jim described as being outside the zero contour line of the Queen pay interval were drilled as Queen dry holes and there is no reason to believe that these wells should present a future problem with fluid migration.

In addition to the three active wells found to have inadequate cement across the injection zone, I discovered an additional two wells which fit this category, these are as follows:

Anadarko Cavalcade Federal No. 3 I-21-18S-32E

13 3/8 @ 753' w/750 sx	TOC-Surface
8 5/8 @ 3465' w/1700 sx	TOC-Surface
5 1/2 @ 10787 w/400 sx	TOC-8917

Mewbourne Buleson Federal No. 1 B-26-18S-32E

11 3/4 @ 350' w/485 sx	TOC-Surface
8 5/8 @ 2800' w/2250 sx	TOC-Surface
4 1/2 @ 8700 w/1205 sx	TOC-4130

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

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SANTA FE, NEW MEXICO 87504
(505) 827-5800

July 14, 1994

HINKLE, COX, EATON,
COFFIELD & HENSLEY
Attorneys at Law
P. O. Box 2068
Santa Fe, New Mexico 87501

RE: CASE NO. 10960
ORDER NO. R-10151

Dear Sir:

Enclosed herewith are two copies of the above-referenced Division order recently entered in the subject case.

Sincerely,

Sally E. Martinez
Administrative Secretary

cc: BLM - Carlsbad
Ed Martin - OCD
Taxation & Revenue

COMMENTS CONCERNING CASE NO. 10960: DRC

With regards to the subject order authorizing Mewbourne to institute a waterflood project in the Querecho Plains-Queen Pool, I believe the order establishes several new precedents contrary to current Division policy. I make the following observations:

According to Finding No. (10), there are five inadequately PA'd wells within the area of review. Three are outside the zero contour lines of the Queen and Penrose formations and two are located near planned producing wells within the project. If the geology substantiates the non-presence of pay sand in three of these wells, I have no problem not requiring re-plugging.
With regards to the other two PA'd wells, I would recommend that these wells be re-plugged because it will be very difficult at best to monitor the producing wells over the next 20-30 years to make sure they remain in a continual producing status.

According to Finding No. (11), there are three deep gas wells within the area of review which are not cemented across the proposed injection interval. In the past several companies have requested that they be allowed to "monitor" wells such as these and repair or recement them only if a problem develops. In the past we have generally not allowed this type of monitoring and have required the company to perform remedial cement operations on the well prior to commencing injection operations. I believe the action taken by this order establishes new Division policy and in the future it will be extremely difficult to require any operator to perform remedial cement operations on any area of review well that is not adequately cemented.
In addition, when a problem does develop in one of these gas wells, it may be too late to adequately repair the well and save gas reserves and/or protect fresh water.

According to Finding No. (12), sufficient evidence was presented as to the corrosive nature of the proposed injected fluid so as to justify the use of non-lined tubing. In the past I believe we generally limited the use of non-lined tubing to injection of <u>fresh</u> water only. Although I did not hear any of the evidence or testimony in this case, I assume that after the period of initial reservoir fill up, most of the injected fluid will be recycled and the quality of the injected fluid is sure to deteriorate with time. Once we establish that non-lined tubing will not be required, I am confident that we cannot possibly monitor the situation and require lined tubing at a later time when it may be needed or appropriate.

According to Finding No. (7), initial shut-in pressures and fracture treatment data was utilized to justify an exception to the 0.2 psi/ft. gradient normally assigned by the Division. To my knowledge, this data alone has not been previously deemed by the Division to be sufficient to justify such exceptions. Step rate tests are normally required to obtain a higher injection pressure. I believe this action also sets a precedent and in the future it will be difficult to require an operator to conduct step rate tests.

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

May 5, 1998

Mewbourne Oil Company
P.O. Box 7698
Tyler, Texas 75711-7698

Attn: Mr. K.M. Calvert

RE: Injection Pressure Increase Quercho Plains Queen Associated Sand Unit EOR Waterflood Project Lea County, New Mexico.

Dear Mr. Calvert:

Reference is made to your request dated September 25, 1997 and revised April 22, 1998, to increase the surface injection pressure on six wells in the above referenced project. This request is based on step rate tests conducted on these wells immediately prior to your original request, and additional information supplied on April 22, 1998. The results of the tests and additional data have been reviewed by my staff and we feel an increase in injection pressures on these wells is justified at this time.

You are therefore authorized to increase the surface injection pressure on the following wells:

Well Name and Number	***Maximum Injection Surface Pressure***
QPQASU Well No.13	1550 PSIG
QPQASU Well No.18	1985 PSIG
QPQASU Well No.22	1650 PSIG
QPQASU Well No.25	1650 PSIG
QPQASU Well No.26	1660 PSIG
QPQASU Well No.27	1700 PSIG
All wells located in Lea County, New Mexico.	

The Division Director may rescind any injection pressure increase if it becomes apparent that the injected water is not being confined to the injection zone or is endangering any fresh water aquifers.

Sincerely,

Lori Wrotenbery
Director

LW/BES/kv

cc: Oil Conservation Division - Hobbs
Files: Case File No.10960; EOR-19; PSI-X 4th QTR 98