

**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. 10495
Order No. R-9453-A**

**APPLICATION OF BEACH EXPLORATION
INC. FOR AMENDMENT OF DIVISION
ORDER NO. R-9453 TO INCREASE THE
INJECTION PRESSURE LIMITATION IN
ITS RED LAKE UNIT PENROSE WATERFLOOD
PROJECT, EDDY COUNTY, NEW MEXICO.**

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on June 25, 1992, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 13th day of July, 1992, 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) By Order No. R-9453 issued in Case No. 10192 on March 12, 1991, the Division, upon application of Beach Exploration Inc., authorized the institution of a waterflood project within the Red Lake Unit located in portions of Township 16 South, Ranges 28 and 29 East, NMPM, East Red Lake Queen-Grayburg Pool, Eddy County, New Mexico, by the injection of water into the Penrose member of the Queen formation through fourteen existing injection wells located in Sections 24, 25, 35 and 36, Township 16 South, Range 28 East, NMPM, and Section 30, Township 16 South, Range 29 East, NMPM.

(3) Said Order No. R-9453 further limited the surface injection pressure on the subject injection wells to no more than 0.2 psi per foot of depth to the uppermost injection perforation or an average of approximately 338 psi.

(4) The applicant, Beach Exploration Inc., seeks an order increasing the surface injection pressure on the fourteen subject injection wells within the Red Lake Unit Penrose Waterflood Project to 1500 psi.

(5) Injection into the subject waterflood project commenced in June, 1991. As of the date of the hearing, the unit has not experienced a response to waterflood operations.

(6) On September 4, 1991, the Division authorized the applicant to inject water into the subject wells at a surface pressure of 900 psi based upon the results of step rate tests conducted on certain wells within the unit.

(7) Applicant's evidence in this case indicates that injection volumes at the current pressure limitation have steadily declined to the point that waterflood operations will be uneconomic within a relatively short period of time.

(8) Applicant testified that effective waterflood operations within the Red Lake Unit should result in the recovery of 550,000 barrels of oil which would otherwise not be recovered.

(9) There are several Queen (Penrose) waterflood projects in the area of the Red Lake Unit which have historically utilized injection pressures ranging from 1360 to 1800 psi to effectively and efficiently carry out secondary recovery operations.

(10) Such projects were approved prior to the Division initiating its policy of limiting surface injection pressures.

(11) Evidence and testimony by the applicant indicates that there have been no occurrences of water out of zone in the general vicinity of the Red Lake Unit as a result of injection into the aforesaid waterflood projects at the injection pressures described above.

(12) The applicant presented engineering evidence and testimony which indicates that:

- a) the Penrose member of the Queen formation is located at a depth of approximately 1660 feet to 1680 feet as shown on the Density/Neutron Log run on the Red Lake Unit Well No. 23 located in Unit F of Section 36; the Queen formation, as shown on the same log, occurs from a depth of approximately 1420 feet to 2110 feet;
- b) the Penrose member of the Queen formation appears to contain horizontal fractures, either natural or previously induced;
- c) injection into the Penrose at a surface injection pressure of 1500 psi will likely cause additional horizontal fracturing in the Penrose formation, however, any vertical fracturing which may occur at such pressure should be limited to an area of approximately 30 feet above and below the Penrose member;
- d) the thickness and rock properties of the Queen interval above the injection zone are sufficient to ensure that the injected fluid will not migrate from the Queen formation at the proposed injection pressure.

(13) The applicant further demonstrated through the conductance of injection profile logs that the construction of the injection wells is sufficient such that migration of fluids should not occur at the proposed injection pressure through the casing annulus.

(14) Fresh water occurs sporadically in this area at a depth of approximately 80 feet.

(15) The applicant, through its engineering evidence and testimony, has satisfactorily demonstrated that injection through the fourteen subject wells at a surface injection pressure of 1500 psi is necessary in order to efficiently and effectively waterflood the Red Lake Unit and will allow the applicant to recover the additional oil reserves underlying said area, thereby preventing waste.

(16) The applicant has further satisfactorily demonstrated that injection into the fourteen subject wells at a surface injection pressure of 1500 psi will not result in the migration of fluid from the Queen formation and will not pose a threat to underground sources of drinking water in this area.

(17) The Division Director should have the authority to reduce or rescind the surface injection pressure approved herein should it become apparent that the injected fluid is not being adequately confined to the East Red Lake Queen-Grayburg Pool.

IT IS THEREFORE ORDERED THAT:

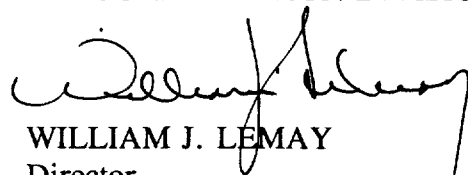
(1) Division Order No. R-9453 is hereby amended to authorize Beach Exploration Inc. to inject water into fourteen previously approved injection wells (as more fully described on Exhibit "A" of Order No. R-9453) located within the Red Lake Unit Penrose Waterflood Project in Sections 24, 25, 35 and 36, Township 16 South, Range 28 East, NMPM, and Section 30, Township 16 South, Range 29 East, NMPM, East Red Lake Queen-Grayburg Pool, Eddy County, New Mexico, at a surface injection pressure of 1500 psi.

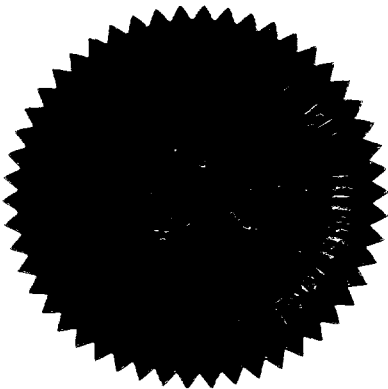
(2) The Division Director shall have the authority to reduce or rescind the surface injection pressure approved herein should it become apparent that the injected fluid is not being adequately confined to the East Red Lake Queen-Grayburg Pool.

(3) Jurisdiction is hereby 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

EXHIBIT "A"
RED LAKE UNIT
APPROVED INJECTION WELLS
CASE NO. 10192
ORDER NO. R-9453

Well Name	Location	Unit	S-T-R	Injection Perforations	Packer Depth	Tubing Size	Maximum Surface Injection Pressure
Amoco State No. 1	2310' FSL & 2287' FWL	K	25-16S-28E	1609' - 1634'	1559'	2 3/8	322
Bogle Farms No. 1	660' FSL & 990' FWL	M	25-16S-28E	1575' - 1599'	1525'	2 3/8	315
Hinkle State "A" No. 1	2310' FSL & 2310' FEL	J	36-16S-28E	1762' - 1809'	1712'	2 3/8	352
N.M. State "35" No. 1	660' FNL & 660' FEL	A	35-16S-28E	1560' - 1585'	1510'	2 3/8	312
N.M. State "36" No. 3	1980' FNL & 990' FWL	E	36-16S-28E	1618' - 1672'	1568'	2 3/8	324
N.M. State "36" No. 4	660' FNL & 1980' FWL	C	36-16S-28E	1656' - 1675'	1606'	2 3/8	331
N.M. State "36" No. 5	1986' FNL & 1983' FEL	G	36-16S-28E	1778' - 1824'	1728'	2 3/8	356
N.M. State "36" No. 6	330' FNL & 981' FEL	A	36-16S-28E	1814' - 1825'	1764'	2 3/8	363
Government No. 1	660' FSL & 1980' FEL	O	25-16S-28E	1779' - 1804'	1729'	2 3/8	356
Government No. 4	2310' FNL & 1980' FEL	G	25-16S-28E	1642' - 1660'	1592'	2 3/8	328
Government No. 5	1650' FSL & 990' FEL	I	25-16S-28E	1816' - 1838'	1766'	2 3/8	363
Allen Federal No. 1	860' FNL & 660' FEL	A	25-16S-28E	1687' - 1807'	1637'	2 3/8	337
Max Federal No. 3	2310' FNL & 330' FWL	E	30-16S-29E	1828' - 1838'	1778'	2 3/8	366
State "24" No. 1	660' FSL & 1980' FEL	O	24-16S-28E	1537' - 1599'	1487'	2 3/8	307

EXHIBIT "B"
RED LAKE UNIT
INADEQUATELY COMPLETED, PLUGGED OR ABANDONED WELLS
CASE NO. 10192
ORDER NO. R-9453

Well Name	Location	Unit	S-T-R
Meridian Federal No. 1	2310' FNL - 990' FWL	E	25-16S-28E
State "24" No. 1	2310' FNL - 2310' FEL	G	24-16S-28E
Kemper State No. 2	660' FNL - 660' FEL	A	36-16S-28E
Southern Union Federal No. 1	660' FSI - 1980' FFI	O	26-16S-28E