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. 11784
Order No. R-10846

APPLICATION OF LAYTON ENTERPRISES
INC. FOR A WATERFLOOD 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 12, 1997, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 16th day of July, 1997, 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, Layton Enterprises Inc., seeks authority to institute a pilot waterflood project within an area comprising all of Sections 1 and 2, the N/2 of Section 11 and the SE/4 NE/4 of Section 10, Township 9 South, Range 36 East, NMPM, Lea County, and the S/2 and NW/4 of Section 36, Township 8 South, Range 36 East, NMPM, Roosevelt County, by the injection of water into the Bough "C" member of the Pennsylvanian formation, Allison-Pennsylvanian Pool, through the gross perforated interval from approximately 9,648 feet to 9,666 feet in its Fox "A" State Well No. 5 located 2310 feet from the North line and 2070 feet from the West line (Unit F) of Section 2.

(3) The applicant further seeks authority to utilize Devonian formation water as source water for its proposed pilot project by completing its Fox "A" State Well No. 5 in the following unconventional manner:

Complete the well utilizing 2 7/8 inch fiberglass-lined tubing installed in a packer set at 9,600 feet. Utilize existing Devonian and Bough "C" perforations from approximately 12,450 feet to 12,492 feet and 9,648 feet to 9,666 feet, respectively, and allow Devonian formation water to freely flow within the wellbore into the Bough "C" interval, thereby expediting reservoir fillup.

(4) Applicant testified that the proposed method of injection is necessary for the following reasons:

a) the availability of source water for a project such as proposed is very limited in this area; and,

b) the additional costs associated with lifting the Devonian water to the surface and re-injecting into the Bough "C" interval would render the project uneconomic.

(5) The proposed pilot project area is comprised of various State and Federal leases. The applicant is the operator of all acreage within the proposed pilot project area. The interest ownership is common within the pilot project area with the exception of royalty and overriding royalty interest.

(6) Applicant's plan of operation within the proposed pilot waterflood project area includes the following:

a) initially convert the Fox "A" State Well No. 5 to injection and evaluate the technical feasibility and effectiveness of utilizing this well in the unconventional manner described in Finding No. (3) above;

b) inject no supplemental fluid down the 2 7/8 inch tubing in the Fox "A" State Well No. 5;

c) utilize seven producing wells within the pilot project area to determine waterflood response;

d) convert additional wells to injection and expand waterflood operations as necessary to expedite reservoir fillup or in the event waterflood response is attained.

(7) The producing wells within the pilot project area are in an advanced state of depletion within the Bough "C" interval of the Allison-Pennsylvanian Pool. Applicant testified that current production within the Bough "C" interval averages approximately 2 BOPD.

(8) Applicant estimates that if the proposed pilot project is successful, an additional 1-3 million barrels of oil may be recovered from the Bough "C" interval within the proposed project area.

(9) Applicant presented geologic testimony which indicates that the proposed pilot project area is located within the southwest portion of the Allison-Pennsylvanian Pool. Applicant further testified that the project area appears to be isolated from the main portion of the pool by a porosity barrier which lies just northeast of the proposed pilot project area and traverses the pool in a northwest to southeast direction.

(10) Although the Devonian formation is productive in some areas in Township 9 South, Range 36 East, (i.e. Allison-Devonian Pool, Crossroads-Devonian Pool, North Crossroads-Devonian Pool, etc.), the applicant has determined by well test that it is non-productive within the Fox "A" State Well No. 5.

(11) Applicant testified that the bottomhole pressure within the Devonian formation is approximately 4,740 psi, and that fluid entry into the Bough "C" interval should occur at a bottomhole pressure of approximately 3,400 psi.

(12) The engineering evidence indicates that injection of water into the Bough "C" interval at a bottomhole pressure of 3,400 psi will not cause fracturing of the injection formation or confining strata.

(13) Applicant estimates that injection into the Bough "C" interval should initially occur at volumes of approximately 2000-2500 barrels of water per day.

(14) Applicant further estimates that it will take approximately 10-12 million barrels of water to achieve reservoir fillup within the Bough "C" interval.

(15) The proposed pilot waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(16) The pilot waterflood project area should be initially limited to all of Section 2.

(17) 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.

(18) In the event the applicant injects fluid from the surface within the Fox "A" State Well No. 5, the pressurization system should be initially equipped with a pressure control device or acceptable substitute which will limit the surface injection pressure to no more than 1930 psi.

(19) The Division Director should have the authority to administratively authorize a pressure limitation in excess of the pressure limitation described above upon a showing by the operator that such higher pressure will not result in the fracturing of the injection formation or confining strata.

(20) 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 conductance of the mechanical integrity pressure test in order that the same may be witnessed.

(21) The proposed pilot 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.

(22) Applicant proposes to monitor injection volumes within the Fox "A" State Well No. 5, pursuant to the requirements of Division Rule No. 704.B., in the following manner:

> a tracer survey will be conducted on the Fox "A" State Well No. 5 initially, on a quarterly basis during the first year of operation, and annually thereafter. Injection volumes will be calculated based upon the results of the tracer surveys.

(23) In order to monitor injection pressure, the applicant should be required to determine bottomhole injection pressure within the Fox "A" State Well No. 5 initially, and at least semi-annually thereafter.

(24) The applicant should further be required to conduct a mechanical integrity pressure test on the Fox "A" State Well No. 5 on an annual basis.

(25) The injection authority granted herein for the proposed injection well should terminate one year after the effective date of this order if the operator has not commenced injection operations into the subject well, 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, Layton Enterprises Inc., is hereby authorized to institute a pilot waterflood project within all of Section 2, Township 9 South, Range 36 East, NMPM, Lea County, by the injection of water into the Bough "C" member of the Pennsylvanian formation, Allison-Pennsylvanian Pool, through the gross perforated interval from approximately 9,648 feet to 9,666 feet in its Fox "A" State Well No. 5 located 2310 feet from the North line and 2070 feet from the West line (Unit F) of Section 2.

(2) The applicant is further authorized to utilize Devonian formation water as source water for its proposed project by completing its Fox "A" State Well No. 5 in the following unconventional manner:

> Complete the well utilizing 2 7/8 inch fiberglass-lined tubing installed in a packer set at 9,600 feet. Utilize existing Devonian and Bough "C" perforations from approximately 12,450 feet to 12,492 feet and 9,648 feet to 9,666 feet, respectively, and allow Devonian formation water to freely flow within the wellbore into the Bough "C" interval, thereby expediting reservoir fillup.

(3) The applicant 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 from injection, production, or plugged and abandoned wells.

(4) The casing-tubing annulus in the Fox "A" State Well No. 5 shall be filled with an inert fluid and equipped with an approved pressure gauge or attention-attracting leak detection device.

(5) In the event the applicant injects fluid from the surface within the Fox "A" State Well No. 5, the pressurization system shall be initially equipped with a pressure control device or acceptable substitute which will limit the surface injection pressure to no more than 1930 psi.

(6) 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 the fracturing of the injection formation or confining strata.

(7) Prior to commencing injection operations, the casing within the Fox "A" State Well No. 5 shall be pressure-tested throughout the interval from the surface down to the proposed packer setting depth, to assure the integrity of such casing.

(8) 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 conductance of the mechanical integrity pressure test in order that the same may be witnessed.

(9) 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 the injection well, 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.

(10) The subject pilot waterflood project is hereby designated the Fox Pennsylvanian Waterflood Project, and 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.

(11) The applicant shall conduct a tracer survey on the Fox "A" State Well No. 5 prior to commencing injection operations, quarterly during the first year of operation, and annually thereafter in order to obtain data with which to calculate injection volumes.

(12) In order to monitor injection pressure, the applicant shall determine the bottomhole injection pressure within the Fox "A" State Well No. 5 initially, and at least semi-annually thereafter.

(13) The applicant shall be required to conduct a mechanical integrity pressure test on the Fox "A" State Well No. 5 on an annual basis.

(14) 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.

(15) 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

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