



NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

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

September 10, 1997

PDEV0020606920

Devon Energy Corporation
20 North Broadway, Suite 1500
Oklahoma City, Oklahoma 73102-8260

Attn: Mr. Ernie L. Buttross, Jr.

**RE: Injection Pressure Increase,
West Red Lake Unit Waterflood Project,
Eddy County, New Mexico**

Dear Mr. Buttross:


Reference is made to your request dated May 8, 1997 to increase the surface injection pressure on one well in the above referenced waterflood project. This request is based on fracture pressure gradient data on five (5) wells surrounding the subject well. Your request has been reviewed by my staff and we feel an increase in injection pressure is justified at this time.

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

<i>Well and Location</i>	<i>Maximum Surface Injection Pressure</i>
West Red Lake Unit Well No.8 Unit Letter G, Section 7, Township 18 South, Range 27 East	760 PSIG .7 psi gradient
Located in Eddy County, New Mexico.	

The Division Director may rescind this 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,

by 
William J. LeMay
Director

WJL/BES

cc: Oil Conservation Division - Artesia
Files: WFX-692; PSI-X 1st QTR 98 ✓

ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION

- Engineering Bureau -

ADMINISTRATIVE APPLICATION COVERSHEET

THIS COVERSHEET IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS

Application Acronyms:

[NSP-Non-Standard Proration Unit] [NSL-Non-Standard Location]
 [DD-Directional Drilling] [SD-Simultaneous Dedication]
 [DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
 [PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
 [WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
 [SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
 [EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

[1] TYPE OF APPLICATION - Check Those Which Apply for [A]

[A] Location - Spacing Unit - Directional Drilling

☐ NSL ☐ NSP ☐ DD ☐ SD

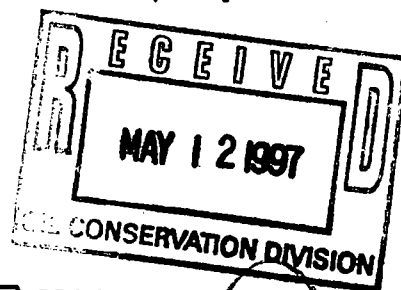
Check One Only for [B] or [C]

[B] Commingling - Storage - Measurement

☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM

[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery

☐ WFX ☐ PMX ☐ SWD ☒ IPI ☐ EOR ☐ PPR



[2] NOTIFICATION REQUIRED TO: - Check Those Which Apply, or ☐ Does Not Apply

[A] ☐ Working, Royalty or Overriding Royalty Interest Owners

[B] ☐ Offset Operators, Leaseholders or Surface Owner

[C] ☐ Application is One Which Requires Published Legal Notice

[D] ☐ Notification and/or Concurrent Approval by BLM or SLO

U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office

[E] ☐ For all of the above, Proof of Notification or Publication is Attached, and/or,

[F] ☐ Waivers are Attached

[3] INFORMATION / DATA SUBMITTED IS COMPLETE - Statement of Understanding

I hereby certify that I, or personnel under my supervision, have read and complied with all applicable Rules and Regulations of the Oil Conservation Division. Further, I assert that the attached application for administrative approval is accurate and complete to the best of my knowledge and where applicable, verify that all interest (WI, RI, ORRI) is common. I further verify that all applicable API Numbers are included. I understand that any omission of data, information or notification is cause to have the application package returned with no action taken.

Note: Statement must be completed by an individual with supervisory capacity.

Ernie Buttross
Print or Type Name

E. L. Buttross
Signature

District Engineer
Title

5/7/97
Date

7-1-58

7-1-58

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devon

ENERGY CORPORATION

20 North Broadway, Suite 1500
Oklahoma City, Oklahoma 73102-8260

Telephone 405/235-3611
FAX 405/552-4550

May 8, 1997

State of New Mexico
Energy, Minerals and Natural Resources Department
Oil Conservation Division
2040 South Pacheco
Santa Fe, New Mexico 88505

Attn: Ben Stone

RE: Administrative Order WFX-692
West Red Lake Unit #8

VERBAL



Gentlemen,

Enclosed is a copy of the above referenced administrative order. This order limits the wellhead pressure on the West Red Lake Unit #8 injection well to no more than 217 psig or .2 psi per foot of depth to the uppermost injection perforation.

Devon Energy Corporation requests that the maximum injection pressures for this well be higher than .2 psi per foot of depth to the uppermost injection perforation. This request is based on the data in Table I which shows the frac gradients obtained from stimulation treatments in the area to be higher.

In a previous application dated 1/29/97 for other injection wells in the West Red Lake Unit, we requested higher maximum injection pressures using the same type of data. Your Administrative Order WFX-708 (see enclosed) subsequently granted higher maximum injection pressures.

If you have any questions, please give me a call at (405) 552-4509.

Sincerely,

Ernie Buttross

Ernie Buttross
District Engineer

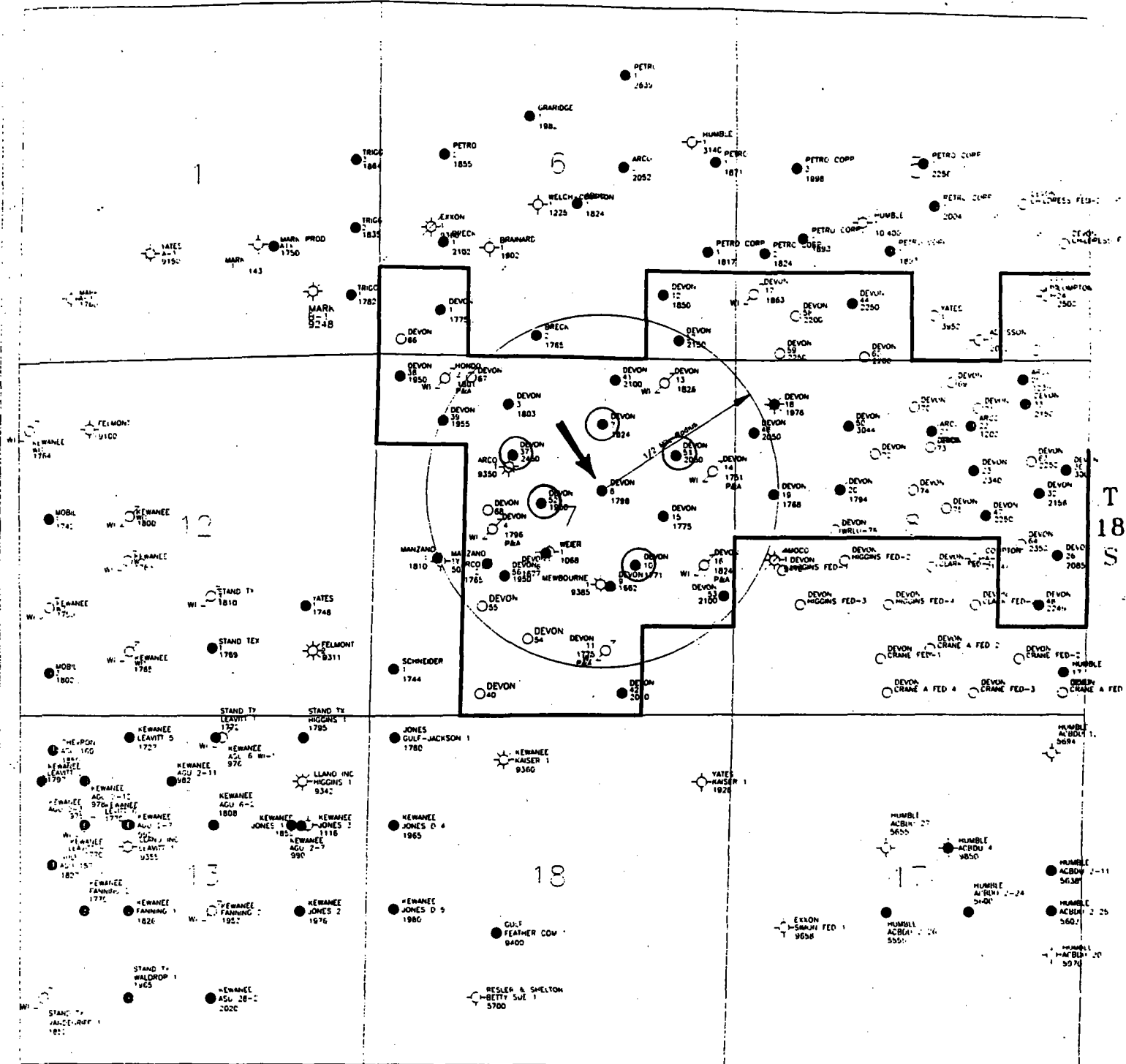
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enclosures

TABLE I
INJECTION WELLHEAD PRESSURE GRADIENTS
WEST RED LAKE UNIT

PROPOSED INJECTOR	OFFSET WELLS	ACID ISIP	TOP PERF	FRAC GRADIENT PSI/FT	WELLHEAD PRESSURE GRADIENT PSI/FT
West Red Lake Unit #8	WRLU #7	900	1103	1.25	0.78
	WRLU #10	800	1034	1.21	0.74
	WRLU #37	950	1535	1.05	0.58
	WRLU #51	1030	1498	1.12	0.65
	WRLU #52	900	1018	1.32	0.85

R 27 E



devon

WEST RED LAKE AREA

EDDY COUNTY, NEW MEXICO

WEST RED LAKE UNIT 8

WRLU-8	

Scale in Feet

1000 0 1000 2000 3000 4000

EB

5/94



NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

WR
8

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

AMENDED ADMINISTRATIVE ORDER NO. WFX-692

APPLICATION OF DEVON ENERGY CORPORATION TO EXPAND ITS WATERFLOOD PROJECT IN THE RED LAKE QUEEN-GRAYBURG-SAN ANDRES POOL IN EDDY COUNTY, NEW MEXICO

**ADMINISTRATIVE ORDER
OF THE OIL CONSERVATION DIVISION**

Under the provisions of Division Order No. R-3469 as amended, Devon Energy Corporation has made application to the Division on July 25, 1996 for permission to expand its West Red Lake Unit Waterflood Project in the Red Lake Queen-Grayburg-San Andres Pool in Eddy County, New Mexico.

THE DIVISION DIRECTOR FINDS THAT:

- (1) The application has been filed in due form.
- (2) Satisfactory information has been provided that all offset operators have been duly notified of the application.
- (3) No objection has been received within the waiting period as prescribed by Rule 701(B).
- (4) The proposed injection wells are eligible for conversion to injection under the terms of Rule 701.
- (5) The proposed expansion of the above referenced waterflood project will not cause waste nor impair correlative rights.
- (6) The application should be approved.

IT IS THEREFORE ORDERED THAT:

The applicant, Devon Energy Corporation, be and the same is hereby authorized to inject water into the Premier, Grayburg and San Andres formations at approximately 1084 feet to approximately 1764 feet through 2 3/8-inch plastic lined or fiberglass tubing set in a packer located within 100 feet of the uppermost injection perforations in the following described well, for purposes of secondary recovery to wit:

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PRODUCTION DEPT.

West Red Lake Unit Well No.8
1980' FNL & 1980' FEL
Unit 'G', Section 7, Township 18 South, Range 27 East, NMPM
Eddy County, New Mexico

IT IS FURTHER ORDERED THAT:

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.

Prior to commencing injection operations into the wells, the casing shall be pressure tested from the surface to the packer setting depth to assure the integrity of said casing.

The casing-tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge at the surface or left open to the atmosphere to facilitate detection of leakage in the casing, tubing or packer.

The injection well or system shall be equipped with a pressure limiting device which will limit the wellhead pressure on the injection well to no more than 217 psig, or, .2 psi per foot of depth to the uppermost injection perforation.

The Director of the Division may authorize an increase in injection pressure upon a proper showing by the operator of said wells that such higher pressure will not result in migration of the injected fluid from the Premier, Grayburg or San Andres formations. Such proper showing shall consist of a valid step-rate test run in accordance with and acceptable to this office.

The operator shall notify the supervisor of the Artesia district office of the Division of the date and time of the installation of injection equipment and of the mechanical integrity tests so that the same may be inspected and witnessed.

The operator shall immediately notify the supervisor of the Artesia district office of the Division of the failure of the tubing, casing or packer in said wells and shall take such steps as may be timely and necessary to correct such failure or leakage.

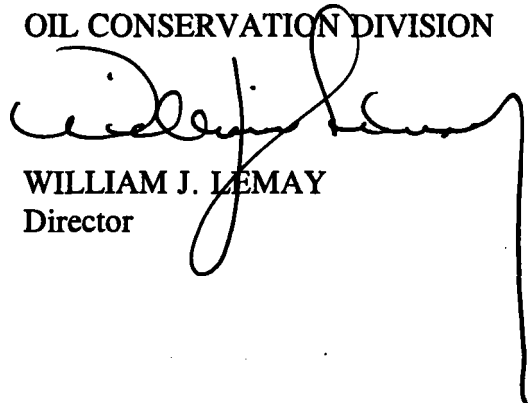
The subject wells shall be governed by all provisions of Division Order No. R-3469, as amended and Rules 702-706 of the Division Rules and Regulations not inconsistent herewith.

PROVIDED FURTHER THAT, jurisdiction of this cause is hereby retained by the Division for the entry of such further order or orders as may be deemed necessary or convenient for the prevention of waste and/or protection of correlative rights; upon failure of the operator to conduct operations in a manner which will ensure the protection of fresh water or in a manner inconsistent with the requirements set forth in this order, the Division may, after notice and hearing, terminate the injection authority granted herein.

The injection authority granted herein 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.

DONE at Santa Fe, New Mexico, on this 19th day of September, 1996.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION



WILLIAM J. LEMAY
Director

S E A L

cc: Oil Conservation Division - Artesia



**NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT**

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87506
(505) 827-7131

ADMINISTRATIVE ORDER NO. WFX-708

**APPLICATION OF DEVON ENERGY CORPORATION TO EXPAND ITS WATERFLOOD
PROJECT IN THE RED LAKE QUEEN-GRAYBURG-SAN ANDRES POOL IN EDDY
COUNTY, NEW MEXICO**

**ADMINISTRATIVE ORDER
OF THE OIL CONSERVATION DIVISION**

Under the provisions of Division Order No. R-3469 as amended, Devon Energy Corporation has made application to the Division on February 3, 1997 for permission to expand its West Red Lake Waterflood Project in the Red Lake Queen-Grayburg-San Andres Pool in Eddy County, New Mexico.

THE DIVISION DIRECTOR FINDS THAT:

- (1) The application has been filed in due form.
- (2) Satisfactory information has been provided that all offset operators have been duly notified of the application.
- (3) No objection has been received within the waiting period as prescribed by Rule 701(B).
- (4) The proposed injection wells are eligible for conversion to injection under the terms of Rule 701.
- (5) The proposed expansion of the above referenced waterflood project will not cause waste nor impair correlative rights.
- (6) The application should be approved.

IT IS THEREFORE ORDERED THAT:

The applicant, Devon Energy Corporation, be and the same is hereby authorized to inject water into the San Andres formation at approximately 1268 feet to approximately 2104 feet through 2 3/8-inch plastic lined tubing set in a packer located within 100 feet of the uppermost injection perforations in the wells described on Exhibit "A" attached hereto, for purposes of secondary recovery.

IT IS FURTHER ORDERED THAT:

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.

Prior to commencing injection operations into West Red Lake Unit Well Nos. 36, 71, and 74, Grayburg and/or Premier interval perforations shall be cement squeezed and pressure tested in a manner satisfactory to the supervisor of the Artesia District Office of the Division. Specific intervals are indicated on Exhibit "A".

Prior to commencing injection operations into the wells, the casing shall be pressure tested from the surface to the packer setting depth to assure the integrity of said casing.

The casing-tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge at the surface or left open to the atmosphere to facilitate detection of leakage in the casing, tubing or packer.

The injection well or system shall be equipped with a pressure limiting device which will limit the wellhead pressure on the injection wells to range from .6 to .9 psi per foot of depth to the uppermost injection perforations of each well as indicated on Exhibit "A".

The Director of the Division may authorize an increase in injection pressure upon a proper showing by the operator of said wells that such higher pressure will not result in migration of the injected fluid from the San Andres formation. Such proper showing shall consist of a valid step-rate test run in accordance with and acceptable to this office.

The operator shall notify the supervisor of the Artesia district office of the Division of the date and time of the installation of injection equipment and of the mechanical integrity tests so that the same may be inspected and witnessed.

The operator shall immediately notify the supervisor of the Artesia district office of the Division of the failure of the tubing, casing or packer in said wells and shall take such steps as may be timely and necessary to correct such failure or leakage.

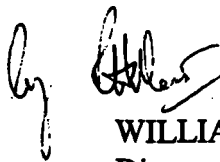
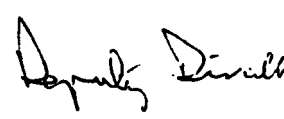
The subject wells shall be governed by all provisions of Division Order No. R-3469, as amended and Rules 702-706 of the Division Rules and Regulations not inconsistent herewith.

PROVIDED FURTHER THAT, jurisdiction of this cause is hereby retained by the Division for the entry of such further order or orders as may be deemed necessary or convenient for the prevention of waste and/or protection of correlative rights; upon failure of the operator to conduct operations in a manner which will ensure the protection of fresh water or in a manner inconsistent with the requirements set forth in this order, the Division may, after notice and hearing, terminate the injection authority granted herein.

The injection authority granted herein 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.

DONE at Santa Fe, New Mexico, on this 12th day of March, 1997.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

 
WILLIAM J. LEMAY
Director

S E A L

cc: Oil Conservation Division - Artesia
Case File No.3824

EXHIBIT "A"
DIVISION ORDER NO. WFX-708
WEST RED LAKE UNIT WATERFLOOD PROJECT
APPROVED INJECTION WELLS

<i>Well Name</i>	<i>Well No.</i>	<i>Location</i>	<i>Unit</i>	<i>S-T-R</i>	<i>Interval to Squeeze</i>	<i>Injection Interval</i>	<i>Packer Depth</i>	<i>Tubing Size</i>	<i>Pressure Gradient</i>	<i>Injection Pressure</i>
West Red Lake Unit	26	2340' FSL & 400' FEL	I	8-18S-27E	N/A	1972'-2081'	1875'	2 3/8"	.75 psi/ft	1479 PSIG
West Red Lake Unit	36	1630' FNL & 330' FEL	H	36-18S-27E	1290'-1298'	1657'-2104'	1575'	2 3/8"	.71 psi/ft	1176 PSIG
West Red Lake Unit	47	2310' FNL & 1510' FEL	G	8-18S-27E	N/A	1656'-2068'	1575'	2 3/8"	.60 psi/ft	994 PSIG
West Red Lake Unit	63	1500' FNL & 850' FEL	H	8-18S-27E	N/A	1656'-2065'	1575'	2 3/8"	.75 psi/ft	1242 PSIG
West Red Lake Unit	71	710' FNL & 1650' FEL	B	8-18S-27E	1194'-1196'	1268'-1996'	1200'	2 3/8"	.72 psi/ft	913 PSIG
West Red Lake Unit	74	1930' FNL & 2600' FEL	G	8-18S-27E	1196'-1225'	1517'-1996'	1450'	2 3/8"	.90 psi/ft	1365 PSIG

All wells in Eddy County, New Mexico