# SWD

# Initial

# Application

Received: 09/10/19

*This application is placed in file for record. It MAY or MAY NOT have been reviewed to be determined Administratively Complete*

Revised March 23, 2017

| RECEIVED: | REVIEWER: | TYPE: | APP NO: |
|---|---|---|---|
| 9/10/2019 | | SWD | pKAM1925556844 |

ABOVE THIS TABLE FOR OCD DIVISION USE ONLY

# NEW MEXICO OIL CONSERVATION DIVISION

- Geological & Engineering Bureau –
1220 South St. Francis Drive, Santa Fe, NM 87505

## ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

**Applicant:** XTO Permian Operating, LLC **OGRID Number:** 373075
**Well Name:** Poker Lake Unit 18 Rummy Fed SWD #1 **API:** TBA
**Pool:** SWD: Devonian-Silurian **Pool Code:** 97869

**SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED BELOW**

1) **TYPE OF APPLICATION:** Check those which apply for [A]
A. Location – Spacing Unit – Simultaneous Dedication
☐ NSL ☐ NSP (PROJECT AREA) ☐ NSP (PRORATION UNIT) ☐ SD

B. Check one only for [ I ] or [ II ]
[ I ] Commingling – Storage – Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM
[ II ] Injection – Disposal – Pressure Increase – Enhanced Oil Recovery
☐ WFX ☐ PMX ☒ SWD ☐ IPI ☐ EOR ☐ PPR

**FOR OCD ONLY**
☐ Notice Complete
☐ Application Content Complete

2) **NOTIFICATION REQUIRED TO:** Check those which apply.
A. ☒ Offset operators or lease holders
B. ☐ Royalty, overriding royalty owners, revenue owners
C. ☒ Application requires published notice
D. ☐ Notification and/or concurrent approval by SLO
E. ☒ Notification and/or concurrent approval by BLM
F. ☒ Surface owner
G. ☒ For all of the above, proof of notification or publication is attached, and/or,
H. ☐ No notice required

3) **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

**Note: Statement must be completed by an individual with managerial and/or supervisory capacity.**

09/10/19
Date

Tracie J. Cherry, Regulatory Lead
Print or Type Name

Tracie J Cherry
Signature

432-221-7379
Phone Number

tracie_cherry@xtoenergy.com
e-mail Address

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL
RESOURCES DEPARTMENT

**Oil Conservation Division**
**1220 South St. Francis Dr.**
**Santa Fe, New Mexico 87505**

FORM C-108
Revised June 10, 2003

## APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: _____ Secondary Recovery _____ Pressure Maintenance __XX__ Disposal _____ Storage
Application qualifies for administrative approval? __XX__ Yes _____ No

II. OPERATOR: XTO Permian Operating, LLC (373075)

ADDRESS: 6401 Holiday Hill Rd. Bldg 5, Midland, TX 79707

CONTACT PARTY: Tracie J. Cherry, Regulatory Lead PHONE: 432-221-7379

III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? _____ Yes __XX__ No
If yes, give the Division order number authorizing the project: _____

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

*X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).

*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

NAME: Tracie J. Cherry TITLE: Regulatory Lead

SIGNATURE: Tracie J Cherry DATE: 09/16/15

E-MAIL ADDRESS: tracie_cherry@xtoenergy.com

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: _____

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;

(3) The formation name and depth with expected maximum injection rates and pressures; and,

(4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

## III. Well Data

A. 1) Lease name: **Poker Lake Unit 18 Rummy Fed SWD**
Well #: **1** **API # TBA**
Section: **18**
Township: **25S**
Range: **31E**
Footage: **2274 FSL & 2500 FEL**

2) Casing Info:

| Casing size | Set depth | Sacks cmt | Hole size | TOC | Method |
|---|---|---|---|---|---|
| 18-5/8", 87.5# J-55 BTC | 930' | 1540 sx C | 24 | Surf | Circ |
| 13-3/8" 68# HCL-80 BTC | 4020' | 2070 sx Poz/C | 17-1/2" | Surf | Circ |
| | | 915 sx C | | | |
| 9-5/8" 53.5# HCP-110 BTC | 12140' | Stage 1 | 12-1/4" | Surf | Circ |
| | | 2245 sx Poz/H | | | |
| DV @ 4120' | | Stage 2 | | | |
| | | 1,250 sx Poz/H | | | |
| 7" 32# HCP-110 BTC | 11,700'-16,950' | 775 sx Poz/H | 8-1/2" | 11,100' | Circ |

3) Tubing to be used (size, lining material, setting depth):
**Tapered String**
**5-1/2" , 17#, P-110 IPC to 11,200'**
**4-1/2", 13.65#, P-110 IPC tubing @ 11,200'-16,850'**

4) Name, model, and depth of packer to be used:
**Baker Series F nickle plated permanent packer @ 16,850'**

B. 1) Name of the injection formation and, if applicable, the field or pool name:
**SWD; Devonian-Silurian**

2) The injection interval and whether it is perforated or open hole:
**Open hole, 16,950'-18,327' (or to the base of the Fusselman as determined by mud logs)**

3) State if the well was drilled for injection or, if not, the original purpose of the well:
**This well is being drilled for the purpose of injection**

4) Give the depths of any other perforated intervals and detail on the sacks of cement or BPs used to seal off such perforations:
**N/A**

5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any:
**Higher: Bell Canyon (+/- 4207'), Cherry Canyon (+/-5,137') Brushy Canyon (+/-6,467'),**
**Bone Spring (+/-9062'), Wolfcamp (+/-11,452'), Strawn (+/-13,777'), Atoka (+/-13,239'), Morrow (+/-14,612')**
**Lower: None**

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office

☐ AMENDED REPORT

# WELL LOCATION AND ACREAGE DEDICATION PLAT

| [1] API Number | [2] Pool Code | [3] Pool Name |
|---|---|---|
| 30-015- | | |

| [4] Property Code | [5] Property Name | [6] Well Number |
|---|---|---|
| | PLU RUMMY 18 FED SWD | 1 |

| [7] OGRID No. | [8] Operator Name | [9] Elevation |
|---|---|---|
| 260737 | XTO PERMIAN OPERATING, LLC. | 3,385' |

## [10] Surface Location

| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| J | 18 | 25 S | 31 E | | 2,275 | SOUTH | 2,500 | EAST | EDDY |

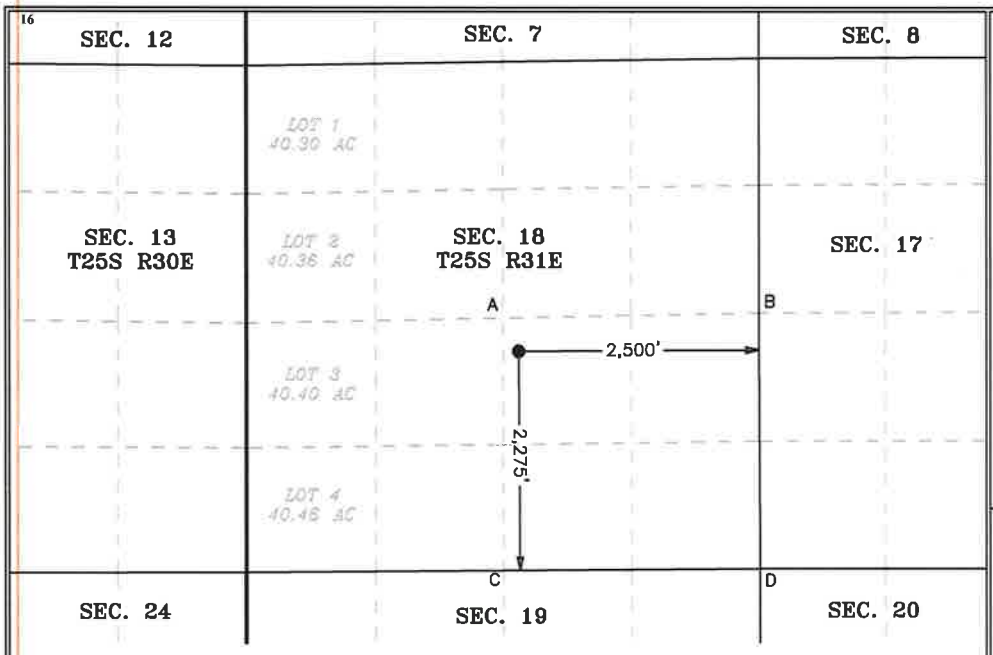
## [11] Bottom Hole Location If Different From Surface

| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

| [12] Dedicated Acres | [13] Joint or Infill | [14] Consolidation Code | [15] Order No. |
|---|---|---|---|
| | | | |

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

[16]




GEODETIC COORDINATES
NAD 83 NME
SURFACE LOCATION
Y= 411,197.9
X= 701,238.3
LAT.= 32.129408°N
LONG.= 103.816781°W

GEODETIC COORDINATES
NAD 27 NME
SURFACE LOCATION
Y= 411,139.8
X= 660,053.2
LAT.= 32.129284°N
LONG.= 103.816300°W

CORNER COORDINATES TABLE
NAD 83 NME
A – Y= 411,539.5 N, X= 701,075.6 E
B – Y= 411,592.7 N, X= 703,735.9 E
C – Y= 408,921.8 N, X= 701,078.7 E
D – Y= 408,939.2 N, X= 703,752.1 E

CORNER COORDINATES TABLE
NAD 27 NME
A – Y= 411,481.4 N, X= 659,890.5 E
B – Y= 411,534.6 N, X= 662,550.8 E
C – Y= 408,863.7 N, X= 659,893.5 E
D – Y= 408,881.1 N, X= 662,566.9 E

## [17] OPERATOR CERTIFICATION

*I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.*

Signature Date

Printed Name

E-mail Address

## [18] SURVEYOR CERTIFICATION

*I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.*

07-18-2019
Date of Survey

Signatue and Seal of Professional Surveyor:


MARK DILLON HARP 23786
Certificate Number

AW 2019051317

# PLU Rummy 18 SWD #1

***Proposed SWD Schematic (Aug 20, 2019)***

**County:** Eddy
**SHL:** 2275' FSL, 2500' FEL
Sec 18, T 25S, R 31E

**BHL:** 2275' FSL, 2500' FEL
Sec 18, T 25S, R 31E

XTO ENERGY

**API #** N/A
**Elevation** GL 3385', KB 3417' (32' AGL)
**Rig:** TBD (RKB 32')

| TVD | Formation | Casing & Cement | Wellhead | Hole Size | General Notes |
|---|---|---|---|---|---|
| | | | (Tech Data Sheet) | | |
| | | *Lead (100% OH excess)*<br>805 sx 12.8ppg Class C<br>Top of Tail @ 0' | | 24" | |
| 842' | Rustler | *Tail (100% OH excess)*<br>735 sx 14.8ppg Class C<br>Top of Tail @ 600' | | | |
| | | **18-5/8" 87.5# J-55 BTC** | **930' MD** | | |
| 1,017' | Rustler Base | | | 17-1/2" | |
| | | *Lead (150% OH excess)* | | | |
| 1,547' | Top Salt | 2070 sx 12.8ppg Poz/C<br>Top of Lead @ 0 | | | |
| | | *Tail (100% OH excess)*<br>915 sx 14.8ppg Class C<br>Top of Tail @ 3200' | | 5-1/2" 17# IPC tbg to 11,200' | |
| 3,862' | Base Salt | | | | |
| | | **13-3/8" 68# HCL-80 BTC** | **4020' MD** | | |
| | | *Stg 2 Lead (100% OH excess)* | | 12-1/4" | |
| 4,175' | Delaware | 815 sx 11.5ppg Poz/H<br>Top of Lead @ 0' | | | |
| | | *Stg 2 Tail (100% OH excess)*<br>435 sx 14.8ppg Poz/H<br>Top of Tail @ 3200' | | | |
| | | DV tool at 4120' | | Crossover @ 11,200' | |
| 8,072' | Bone Spring | *Stg 1 Lead (100% OH excess)*<br>1690 sx 11.5ppg Poz/H<br>Top of Lead @ 4120' | **11700' MD** | | |
| | | *Stg 1 Tail (100% OH excess)* | | 4-1/2" 13.65# IPC tbg to 16,685' | |
| 11,417' | Wolfcamp | 555 sx 14.8ppg Poz/H<br>Top of Tail @ 11140' | | | |
| 11,987' | Wolfcamp B | | | | |
| | | **9-5/8" 53.5# HCP-110 BTC** | **12140' MD** | | |
| | | | | 8-1/2" | |
| | | *Tail (40% OH excess)*<br>775 sx 14.5ppg Poz/H | | | |
| 13,777' | Strawn | Top of Tail @ 11700' | | | |
| 13,937' | Atoka | | | | |
| 14,612' | Morrow | | | | |
| 16,457' | Mississippian Lm | | | Baker Series F Packer @<br>16,850' | |
| 16,537' | Woodford | | | | |
| 16,932' | Devonian | | | | |
| | | **7" 32# HCP-110 BTC** | **16950' MD** | | |
| 18,157' | Base of Fusselman | | | 6" | |
| 18,327' | TVD at BHL | **Open hole completion** | | | |
| | | | **18,327' MD**<br>**18,327' TVD** | | |

## Approvals

**Prepared by:** _____

**Peer Reviewed by:** _____
Date

**Reviewed by:** _____

**Approved by:** _____

## C-108 DATA

**V.** Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well.
**Maps attached (Exhibit A & Exhibit B).**

**VI.** Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each wells type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
**(Exhibit C)**
**One (1) horizontal well terminiates within the one-mile Area of Review. It does not penetrate the proposed disposal zone.**

**No plugged and abandoned wells are within the one-mile Area of Review**

**VII.** Attach data on the proposed operation, including:
1. Proposed average and maximum daily rate and volume of fluids to be injected:
**20,000 average, 50,000 maximum BWPD**
2. Whether the system is open or closed: **closed**
3. Proposed average and maximum injection pressure: **2,000 psi average, 3,390 psi maximum**
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water: **Well will be part of a multi-well SWD system taking Permian waters. The majority of the produced water will come from Delaware, Bone Spring and Wolfcamp formations with minor amouts from Atoka and Morrow.**
**An analysis of water to be disposed is attached (Exhibit D)**

5. If injection is for disposal purposes into a zone not productive of oil & gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water:

**No disposal wells are within one mile of the proposed well.**

**VIII.** *Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with TDS of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval*:

| | |
|---|---|
| **Lithologic Detail:** | **Carbonates (Dolomite and Limestone)** |
| **Geological Name:** | **Devonian (Silurian-Devonian)** |
| **Thickness:** | **Est. 1,465'** |
| **Depth:** | **Est. 16932' to 18467' (includes 100' buffer)** |

**The Dewey Lake Red Beds consisting of alluvial sandstones, siltstones, and shales are present from the surface to the top of the Rustler Anhydrite. The top of the Rustler Anhydrite is estimated to be at approximately 842 feet below the surface in this PLU Rummy 18 Fed SWD 1 well. These Dewey Lake Red Beds may occassionally contain fresh water throughout this geographic area, but it is not always of drinking water quality (TDS of 10,000 mg/L or less). Based on a water well search using the New Mexico Office of State Engineer website, there are two referenced water well files C-1839 and C-1831 within a 1 1/2 mile radius. Oxy Petroleum Inc. is the appliacant. The wells were related to oil and gas well drillling. Oxy wrote a letter to the file that states the C-1839 well was not drilled. The C-1831 well file is not clear, there is not an application, it appears to be an existing well that may have been active for a while, but file shows the permit is currently expired. The application in well C-1839 states the proposed well was to be drilled to 700 feet deep so this is likely the depth to bottom of water source .**

**Based on published maps, the Capitan Reef Aquifer is not present in this area**

**No sources of fresh water are known to exist below the proposed disposal zone.**

IX. Describe the proposed stimulation program, if any:
**Acid stimulate with approximately 5000 gallons of 15% NEFE HCL acid.**

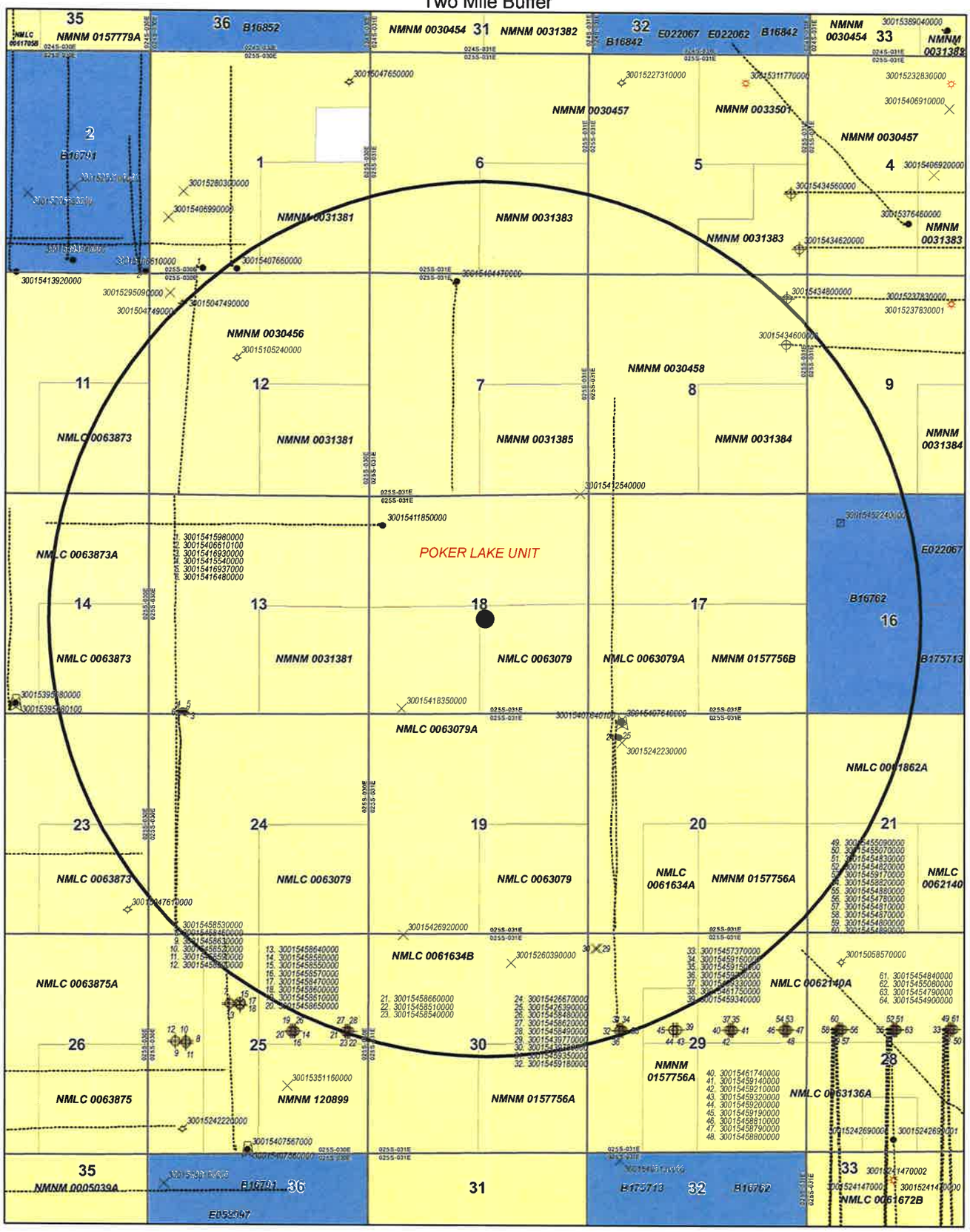
X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted.)
**Logs will be submitted with completion papers when well is drilled.**

XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.
**According to the New Mexico Office of State Engineer database, there is one (a) point of diversion within a one-mile radius of the proposed well. The status of the well is undetermined. XTO is currently performing a field inspection to determine if the well is still active. Only information available on the OSE database is the permit to drill the subject well.**
**(Exhibit E)**

XII. Applicants for disposal wells must make an affimative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydology connection between the disposal zone and any underground sources of drinking water.
**(Exhibit F)**

XIV. Proof of Notice
**(Exhibit G)**

# PLU 18 Rummy FED SWD 1
## Eddy County, New Mexico
### Two Mile Buffer



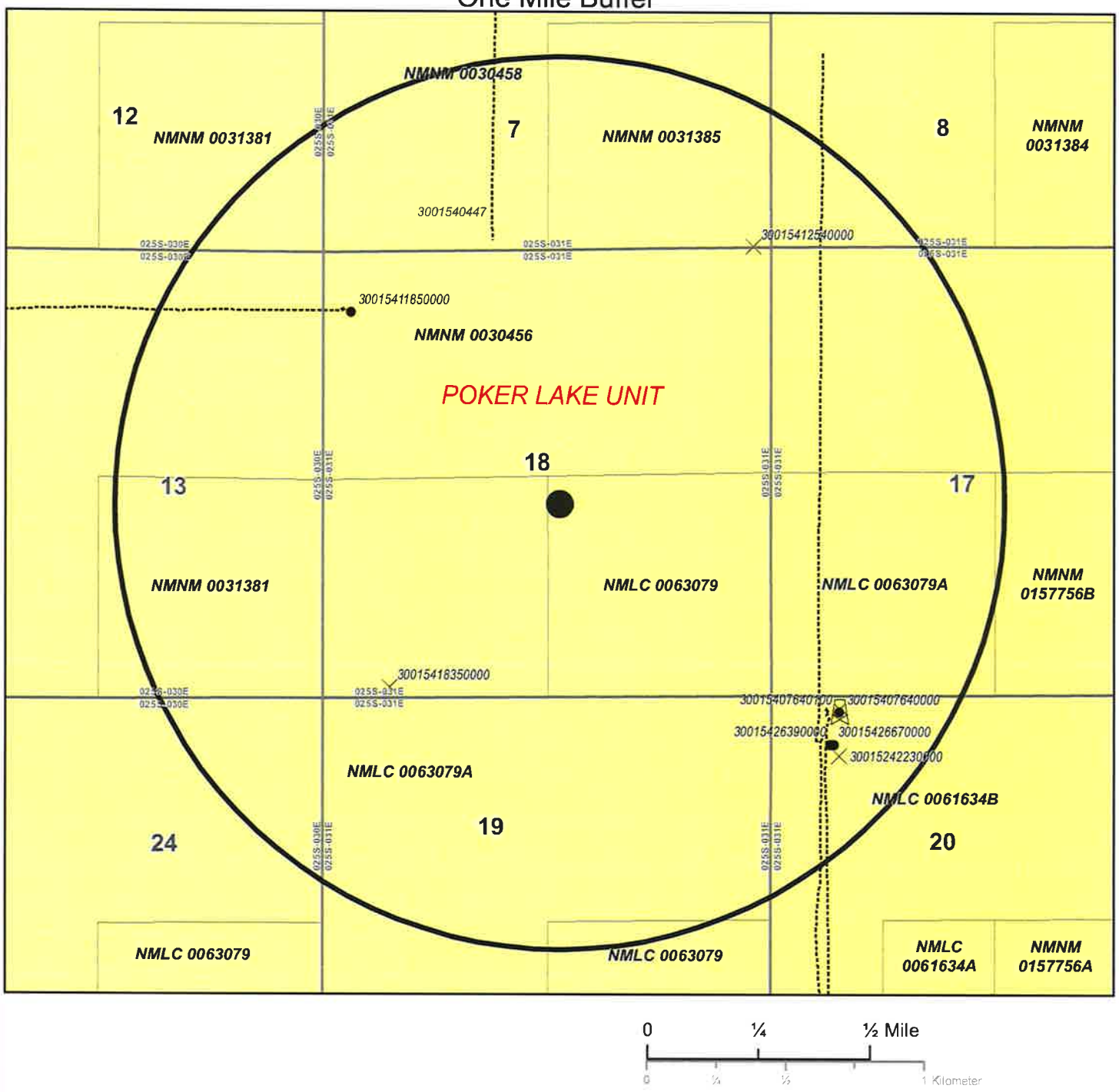

wellbore
State Lease
Federal Lease
two mile buffer

**Well Status Name**
GAS
INJECTION
MULTI OIL AND GAS PRODUCER
OIL
OIL AND GAS PRODUCER
MULTIPLE GAS PRODUCER
MULTIPLE OIL PRODUCER
ABANDONED
DRILLING
NON-PRODUCING OTHER
CO2
DRY
STORAGE
CBM
OTHER PRODUCING
WATER SUPPLY WELL
WELL PERMIT
WELL START

**known operators in buffer**
BOPCO LP
CHOCTAW PROD CO
XTO PERMIAN OPER LLC

# Exhibit A
Two Mile Radius Map

# PLU 18 Rummy FED SWD 1
## Eddy County, New Mexico
### One Mile Buffer




wellbore
State Lease
Federal Lease
one mile buffer

**Well Status Name**

- GAS
- INJECTION
- MULTI OIL AND GAS PRODUCER
- OIL
- OIL AND GAS PRODUCER
- MULTIPLE GAS PRODUCER
- MULTIPLE OIL PRODUCER
- ABANDONED
- DRILLING
- NON-PRODUCING OTHER
- CO2
- DRY
- STORAGE
- CBM
- OTHER PRODUCING
- WATER SUPPLY WELL
- WELL PERMIT
- WELL START

**known operators in buffer**
BOPCO LP
XTO PERMIAN OPER LLC

# Exhibit B
One Mile Radius Map

XTO Permian Operating LLC

Poker Lake Unit 18 Rummy Fed SWD #

001

Eddy County, NM

*Wells Within One Mile of Proposed SWD*

| API | well_type | wellname | section | township | range | unit_ltr | ogrid_name | status | spud_year | ectional_sta | pool_id_list | Well Status |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30-015-24223 | O | POKER LAKE UNIT #057 | 20 | 25S | 31E | C | PERRY R. BASS | C | 9999 | 0 | No Data | Cancelled APD |
| 30-015-40764 | O | POKER LAKE CVX JV PB #006H | 20 | 25S | 31E | D | XTO PERMIAN OPERATING LLC. | A | 2013 | H | [96654] WILDCAT BIG SINK, BONE SPRING | Active |
| 30-015-41185 | O | POKER LAKE UNIT #387H | 18 | 25S | 31E | 1 | XTO PERMIAN OPERATING LLC. | A | 2013 | 0 | [50386] POKER LAKE, DELAWARE, SOUTH | Active |
| 30-015-41254 | O | POKER LAKE UNIT #352H | 7 | 25S | 31E | P | XTO PERMIAN OPERATING LLC. | N | 9999 | 0 | [96209] CORRAL CANYON, DELAWARE, NORTHEAST | New (Not Drilled/Completed) |
| 30-015-41835 | O | PLU BIG SINKS 18 25 31 USA #001H | 18 | 25S | 31E | 4 | XTO PERMIAN OPERATING LLC. | N | 9999 | 0 | [97913] WILDCAT G-06 S253002O, BONE SPRING | New (Not Drilled/Completed) |
| 30-015-42639 | O | POKER LAKE UNIT CVX JV PB #007H | 20 | 25S | 31E | D | XTO PERMIAN OPERATING LLC. | A | 2015 | H | [97913] WILDCAT G-06 S253002O, BONE SPRING | Active |
| 30-015-42667 | O | POKER LAKE UNIT CVX JV BS #034H | 20 | 25S | 31E | D | XTO PERMIAN OPERATING LLC. | A | 2014 | H | [97913] WILDCAT G-06 S253002O, BONE SPRING | Active |
| | | | | | | | | | | | | |
| Wells with terminus inside one-mile area of review | | | | | | | | | | | | |
| 30-015-40447 | O | POKER LAKE UNIT CVX JV BS #017H | 7 | 25S | 31E | C | XTO PERMIAN OPERATING LLC. | A | 2012 | H | [97913] WILDCAT G-06 S253002O, BONE SPRING | Active |

# Exhibit C

List of Wells - 1 Mile Radius

NALCO Champion
An Ecolab Company

# Complete Water Analysis Report

Customer: **XTO ENERGY INC**
Region: **Carlsbad, NM**
Location: **Nash Draw 19**
System: **Production System**

Equipment: **Nash Draw 19 Federal 001 SWD**
Sample Point: **Transfer Pump**
Sample ID: **AL07043**
Acct Rep Email: **Anthony.Baeza@ecolab.com**

Collection Date: **06/08/2018**
Receive Date: **06/21/2018**
Report Date: **06/25/2018**
Location Code: **375624**

## Field Analysis

| | | | | | |
|---|---|---|---|---|---|
| Bicarbonate | 60 mg/L | Dissolved CO2 | 1100 mg/L | Dissolved H2S | 9 mg/L |
| Pressure Surface | 20 psi | Temperature | 96 ° F | pH of Water | 6.3 |
| Oil per Day | 0 B/D | Gas per Day | 0 Mcf/D | Water per Day | 3500 B/D |

## Sample Analysis

| | | | | | |
|---|---|---|---|---|---|
| Calculated Gaseous CO2 | 1.11 % | Calculated pH | 6.30 | Conductivity (Calculated) | 392527 µS - cm3 |
| Ionic Strength | 5.25 | Resistivity | 0.025 ohms - m | Specific Gravity | 1.196 |
| Total Dissolved Solids | 251270.3 mg/L | | | | |

### Cations

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Iron | 46 | mg/L | Manganese | 7.14 | mg/L | Barium | 7.61 | mg/L |
| Strontium | 2000 | mg/L | Calcium | 28400 | mg/L | Magnesium | 4050 | mg/L |
| Sodium | 51200.00 | mg/L | Potassium | 1530 | mg/L | Boron | 28.9 | mg/L |
| Lithium | 15.1 | mg/L | Copper | 0.414 | mg/L | Nickel | 0.122 | mg/L |
| Zinc | 1.88 | mg/L | Lead | 0.25 | mg/L | Cobalt | 0.043 | mg/L |
| Chromium | 0.02 | mg/L | Silicon | 4.79 | mg/L | Aluminum | Not Detected | mg/L |
| Molybdenum | 0.026 | mg/L | Phosphorus | 6.44 | mg/L | | | |

### Anions

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Bromide | 1744.463 | mg/L | Chloride | 165315 | mg/L | Sulfate | 184.003 | mg/L |

## PTB Value

| | Barite PTB | Calcite PTB | Celestite PTB | Gypsum PTB | Halite PTB | Iron Carbonate PTB | Iron Sulfide PTB |
|---|---|---|---|---|---|---|---|
| 50° | 4.29 | 11.73 | 93.75 | 25.67 | 0.00 | 0.00 | 7.10 |
| 75° | 3.93 | 10.87 | 78.70 | 0.00 | 0.00 | 0.00 | 6.56 |
| 100° | 3.30 | 10.04 | 66.11 | 0.00 | 0.00 | 0.00 | 6.05 |
| 125° | 2.32 | 9.28 | 56.94 | 0.00 | 0.00 | 0.00 | 5.62 |
| 150° | 0.96 | 8.63 | 51.03 | 0.00 | 0.00 | 0.00 | 5.29 |
| 175° | 0.00 | 8.11 | 47.56 | 0.00 | 0.00 | 0.00 | 5.06 |
| 200° | 0.00 | 7.71 | 45.63 | 0.00 | 0.00 | 0.00 | 4.90 |
| 225° | 0.00 | 7.43 | 44.51 | 0.00 | 0.00 | 0.00 | 4.82 |
| 250° | 0.00 | 7.26 | 43.71 | 0.00 | 0.00 | 0.00 | 4.79 |
| 275° | 0.00 | 7.17 | 42.91 | 0.00 | 0.00 | 0.00 | 4.79 |
| 300° | 0.00 | 7.14 | 42.00 | 0.00 | 0.00 | 0.00 | 4.82 |
| 325° | 0.00 | 7.16 | 40.97 | 0.00 | 0.00 | 0.00 | 4.86 |
| 350° | 0.00 | 7.22 | 39.85 | 0.00 | 0.00 | 0.00 | 4.90 |
| 375° | 0.00 | 7.27 | 38.56 | 0.00 | 0.00 | 0.00 | 4.94 |
| 400° | 0.00 | 9.14 | 36.83 | 0.00 | 0.00 | 0.00 | 6.24 |

## Saturation Index

| | Barite SI | Calcite SI | Celestite SI | Gypsum SI | Halite SI | Iron Carbonate SI | Iron Sulfide SI |
|---|---|---|---|---|---|---|---|
| 50° | 1.28 | 1.32 | 0.65 | 0.11 | -0.52 | -0.16 | 2.19 |
| 75° | 0.88 | 1.18 | 0.47 | -0.06 | -0.54 | -0.19 | 1.87 |
| 100° | 0.57 | 1.06 | 0.35 | -0.16 | -0.56 | -0.21 | 1.62 |
| 125° | 0.32 | 0.96 | 0.29 | -0.23 | -0.58 | -0.23 | 1.43 |
| 150° | 0.11 | 0.88 | 0.25 | -0.29 | -0.60 | -0.25 | 1.30 |
| 175° | -0.07 | 0.81 | 0.23 | -0.35 | -0.61 | -0.27 | 1.21 |
| 200° | -0.23 | 0.76 | 0.23 | -0.41 | -0.63 | -0.30 | 1.15 |
| 225° | -0.36 | 0.73 | 0.21 | -0.49 | -0.65 | -0.32 | 1.12 |
| 250° | -0.48 | 0.70 | 0.20 | -0.57 | -0.66 | -0.36 | 1.11 |
| 275° | -0.59 | 0.68 | 0.20 | -0.64 | -0.68 | -0.40 | 1.12 |
| 300° | -0.70 | 0.67 | 0.19 | -0.71 | -0.69 | -0.45 | 1.12 |
| 325° | -0.81 | 0.66 | 0.19 | -0.74 | -0.71 | -0.52 | 1.14 |
| 350° | -0.92 | 0.65 | 0.18 | -0.73 | -0.72 | -0.60 | 1.15 |
| 375° | -1.04 | 0.63 | 0.17 | -0.66 | -0.73 | -0.71 | 1.15 |
| 400° | -1.17 | 0.81 | 0.17 | -0.49 | -0.74 | -0.63 | 1.56 |

Scaling predictions calculated using Scale Soft Pitzer 2017
Scaling predictions dependent on provided field data. Incomplete/partial field data may impact results generated by scaling software.



Exhibit D
Water Analysis
1 of 2

NALCO Champion
An Ecolab Company

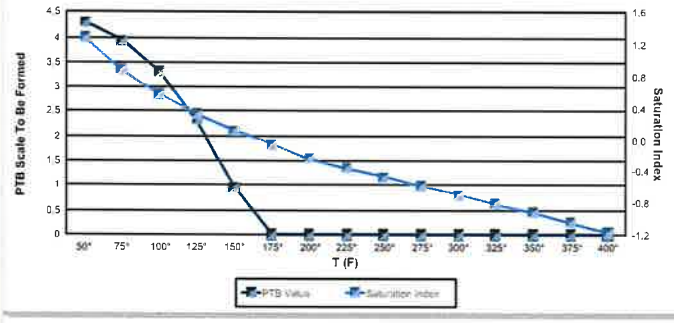
# Complete Water Analysis Report

Customer: **XTO ENERGY INC**
Region: **Carlsbad, NM**
Location: **Nash Draw 19**
System: **Production System**

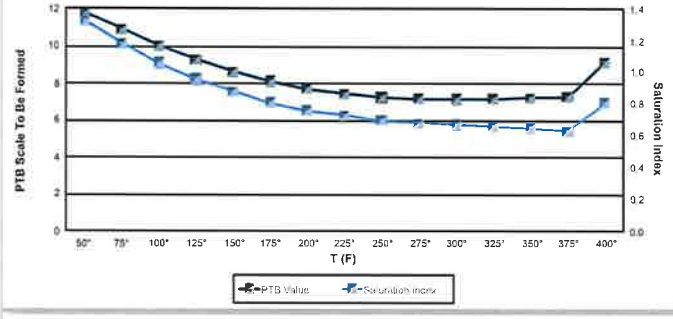
Equipment: **Nash Draw 19 Federal 001 SWD**
Sample Point: **Transfer Pump**
Sample ID: **AL07043**
Acct Rep Email: **Anthony.Baeza@ecolab.com**

Collection Date: **06/08/2018**
Receive Date: **06/21/2018**
Report Date: **06/25/2018**
Location Code: **375624**

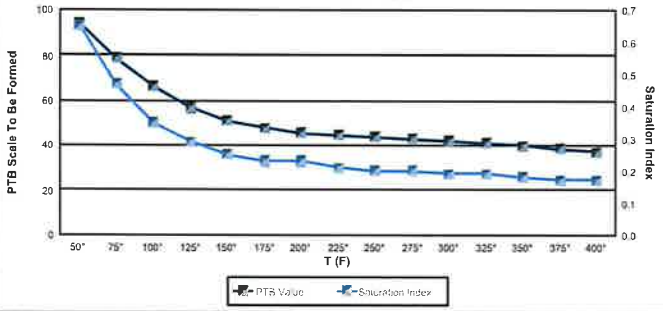
## Barite BaSO4



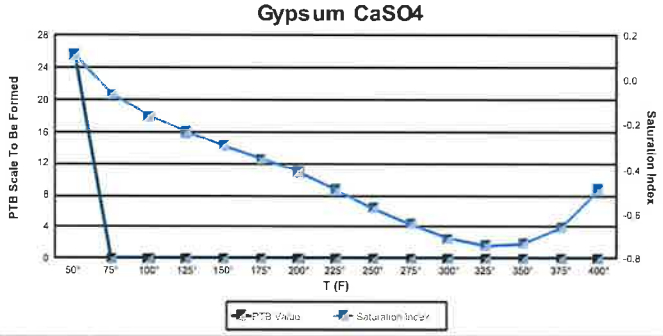

## Calcite CaCO3



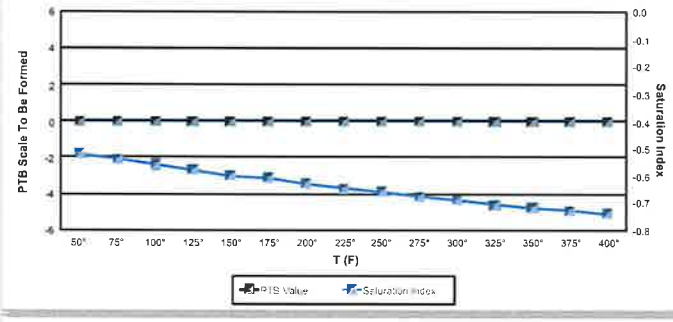

## Celestite SrSO4



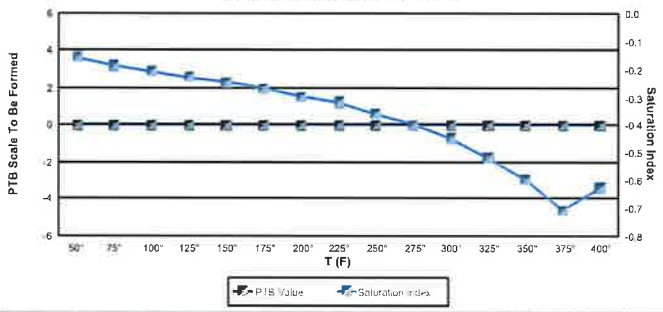

## Gypsum CaSO4



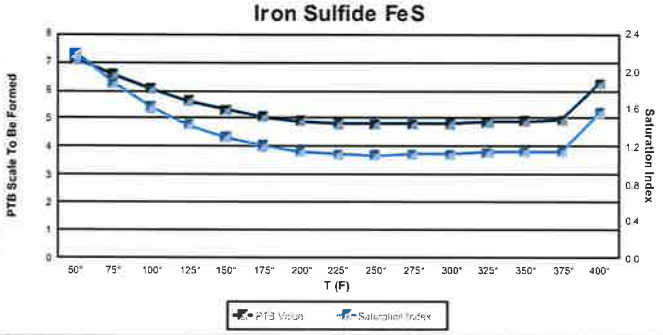

## Halite NaCl




## Iron Carbonate FeCO3




## Iron Sulfide FeS



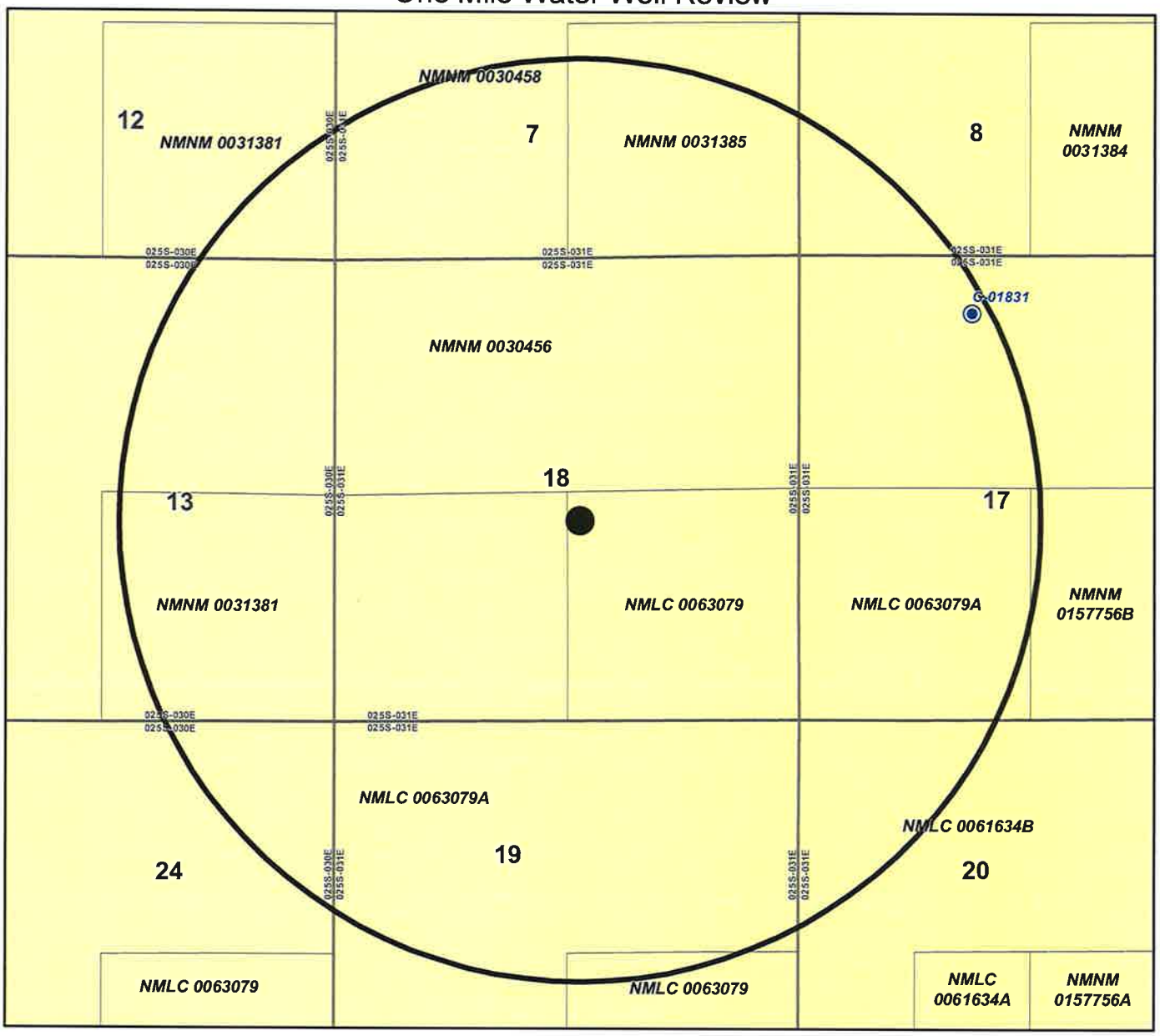

## Comments

Scaling predictions calculated using Scale Soft Pitzer 2017
Scaling predictions dependent on provided field data. Incomplete/partial field data may impact results generated by scaling software.



Exhibit D
Water Analysis
2 of 2

# PLU 18 Rummy FED SWD 1
## Eddy County, New Mexico
### One Mile Water Well Review




water well
-location
-surface declaration
-surface permit

State Lease

Federal Lease

one mile buffer

## Exhibit E

Water Wells – One Mile Radius

*New Mexico Office of the State Engineer*

# Point of Diversion Summary

| Well Tag | POD Number | (quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest) Q64 | Q16 | Q4 | Sec | Tws | Rng | (NAD83 UTM in meters) X | Y |
|---|---|---|---|---|---|---|---|---|---|
| | C 01831 | 2 | 1 | | 17 | 25S | 31E | 612972 | 3556126* |

**Driller License:**

**Driller Company:**

**Driller Name:**

**Drill Start Date:**

**Drill Finish Date:**

**Plug Date:**

**Log File Date:**

**PCW Rcv Date:**

**Source:**

**Pump Type:**

**Pipe Discharge Size:**

**Estimated Yield:**

**Casing Size:**

**Depth Well:**

**Depth Water:**

***UTM location was derived from PLSS - see Help**



8/28/19 1:16 PM POINT OF DIVERSION SUMMARY

August 28, 2019

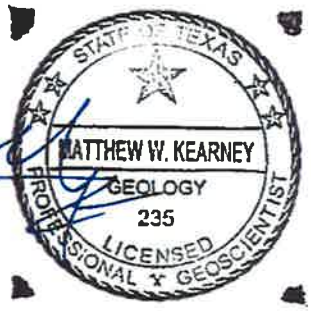
New Mexico, Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: **Geology Statement per Question XII on the Application for Authorization to Inject Form C-108 for**
XTO Energy Inc., an ExxonMobil subsidiary
PLU Rummy 18 Fed SWD 1,
Section 18, Township 25 South, Range 31 East,
Eddy County, New Mexico

To whom it may concern:

XTO Energy, Inc., an ExxonMobil subsidiary, has examined available geological data at the above-mentioned well located at 2,275 feet from the south line and 2,500 feet from the east line of Section 18, Township 25 South, Range 31 East, Eddy County, New Mexico; and finds no evidence of open faults or other hydrologic connection between the disposal zone and the underground sources of drinking water.

Respectively Submitted,




**Matthew W. Kearney, P.G.**
Geoscientist
XTO Energy Inc., an ExxonMobil subsidiary
22777 Springwoods Village Parkway
Spring, Texas 77389

Exhibit F
Geological Statement

CARLSBAD
CURRENT-ARGUS



## AFFIDAVIT OF PUBLICATION

**Ad No.**
**0001295229**

Tracie J Cherry
XTO ENERGY
6401 HOLIDAY HILL RD. BLDG 5

MIDLAND TX 79707

I, a legal clerk of the **Carlsbad Current-Argus**, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the State wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof on the date as follows, to wit:

**08/29/19**

Kathleen Allen
Legal Clerk

Subscribed and sworn before me this
29th of August 2019.

Tara Mondloch
State of WI, County of Brown
NOTARY PUBLIC

8-6-21
My Commission Expires

TARA MONDLOCH
Notary Public
State of Wisconsin

NOTICE OF APPLICATION FOR
WATER DISPOSAL WELL PERMIT

XTO Permian Operating, Inc. has applied to the New Mexico Oil Conservation Division for a permit to dispose of produced water into a porous formation not productive of oil or gas.

The applicant proposes to dispose of produced water into the Poker Lake Unit 18 Rummy Fed SWD #1 (Siluro-Devonian and Fusselman Formations). The maximum injection pressure will be 3,390 psi and the maximum rate will be 50,000 bbls. produced water per day. The proposed disposal well is located approximately 15 miles Southeast of Malaga, New Mexico in Section 18, T25S, R31E; 2,275' FSL & 2,500' FEL, Eddy County, New Mexico. The produced water will be disposed at a subsurface depth of 16,950'-18,327'.

Any questions concerning this application should be directed to Tracie J Cherry, Regulatory Coordinator, XTO Energy, Inc, 6401 Holiday Hill Rd, Bldg 5, Midland, Texas 79707, (432) 221-7379.

Interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 S. St. Francis Dr., Santa Fe, New Mexico 87505 within 15 days.

Published: August 29, 2019

Ad#:0001295229
P O : Pler Lake Unit 18
# of Affidavits :0.00

Exhibit G
Notifications
1 of 2

CERTIFIED MAILING LIST
XTO PERMIAN OPERATING, LLC
POKER LAKE UNIT 18 RUMMY FED SWD #1

| | | |
|---|---|---|
| Surface/Mineral Owner: | **Cert #7018 1130 0001 5531 6532**<br>Bureau of Land Management<br>620 E. Greene Street<br>Carlsbad, NM 88220-6292 | |
| Grazing Lessee: | **Cert #7018 1130 0001 5531 6549**<br>DK Farms<br>2727 Racquet Club Drive<br>Midland, TX 79705 | |
| Offset Notice: | **Cert #7018 1130 0001 5531 6556**<br>Chevron USA Inc<br>630 Deauville<br>Midland, TX 79706-2964 | All Sections |
| | **Cert #7018 1130 0001 5531 6563**<br>Devon Energy Production Co.<br>333 W Sheridon<br>Oklahoma City, OK 73102-5010 | Section 17, 18 & 19 25S-31E<br>Section 24 25S-30E |
| | **Cert #7018 1130 0001 5531 6570**<br>Fortson Oil Co.<br>301 Commerce #3301<br>Ft Worth, TX 76102-4133 | Section 17<br>(NMNM0157756B) |

I, Tracie J Cherry, do hereby certify the surface owner and offset parties for the well shown were furnished a copy of XTO Permian Operating, LLC's application for salt water disposal, via certified mail on this date.

Signed: Tracie J Cherry
Title: Regulatory Lead
Date: 09/10/19

Exhibit G
Notifications
2 of 2

XTO ENERGY

## Statements Regarding Seismicity

XTO has performed a seismicity risk assessment associated with the proposed Poker Lake Unit Rummy 18 SWD 1 Well by investigating historic seismicity, the presence of deep faulting, orientation of faults relative to the current stress regime and the potential for pore pressure build up that might cause a fault to slip. The analysis was done utilizing Stanford's Fault Slip Potential Tool version 2.0 (FSP; Walsh et al. 2017). To accommodate the tool's analytics, a simplified spatial relationship between the proposed well and possible faulting was established.

As part of our risk assessment we also consider mitigation options to address inherent uncertainties associated with the evaluation of possible seismicity. XTO has developed and will implement, as a precautionary measure, a seismicity monitoring plan to address the inherent uncertainty in the subsurface characterization, future rates of disposal and reservoir response.

A summary of the evaluation and seismicity monitoring plan follows:

## Historic Seismicity

There are no seismic events reported by the USGS within ~6 miles of the proposed well. Additionally, the Texas Bureau of Economic Geology's TexNet website shows no recent earthquakes in Texas within ~25 miles of the New Mexico border in the Delaware Basin (Figure 1).

## Deep Faulting

Utilizing licensed 3D seismic data in the area of the proposed SWD well, XTO has evaluated one fault and/or linear feature. Additionally, there are several seismic discontinuities that are interpreted as karst features in the Devonian section that do not appear to have significant lateral continuity.

## Stress Regime

Utilizing data and analysis from Snee and Zoback, 'State of Stress in the Permian Basin, Texas and New Mexico: Implications for Induced Seismicity' (Feb 2018, The Leading Edge) the region of the proposed well is primarily a normal faulting regime (Figure 1).

## Geomechanical Modeling

A simple screening level geometric / geomechanical assessment of the faults was performed utilizing the FSP tool. The models were run using the Aphi option which makes a simplifying and conservative assumption that faults are critically stressed and thus close to failure. Additionally, given the uncertainties in the geophysical interpretation and stress information, probabilistic scenarios were run varying fault and stress characteristics. FSP model deterministic and uncertainty inputs and results of the modeling are shown in Figure 2

## Pore Pressure Modeling

A screening level investigation of possible pore pressure increases due to the proposed SWD well was performed utilizing the FSP tool and a range of reservoir parameters. For this screening level analysis a 'high-side', flat rate model was run assuming disposal of 40,000 BWPD beginning in 2019 and continuing at that rate until 2040. Sensitivities were performed by varying several reservoir parameters. Deterministic models, snap shots of the calculated pore pressure increases

in 2025 and 2040 and cross-plots of pore pressure uncertainty analysis and fault slip probabilities are shown in Figure 3.

**Integration of Geomechanical and Pore Pressure Modeling**

Integration of the geomechanical and hydrological elements of the assessment was performed using the FSP Integrated module. The results are shown in Figure 4. Note the y-axis in the lower right hand colored graphs in Figure 4 are labeled 'Fault Slip Potential'. This is a labeling convention within the tool but overstates the efficacy of the analysis. The FSP output should not be taken as calculating a reliable probability of a fault slipping but rather a screening method for assessing the relative potential of faults to slip.

**Uncertainty**

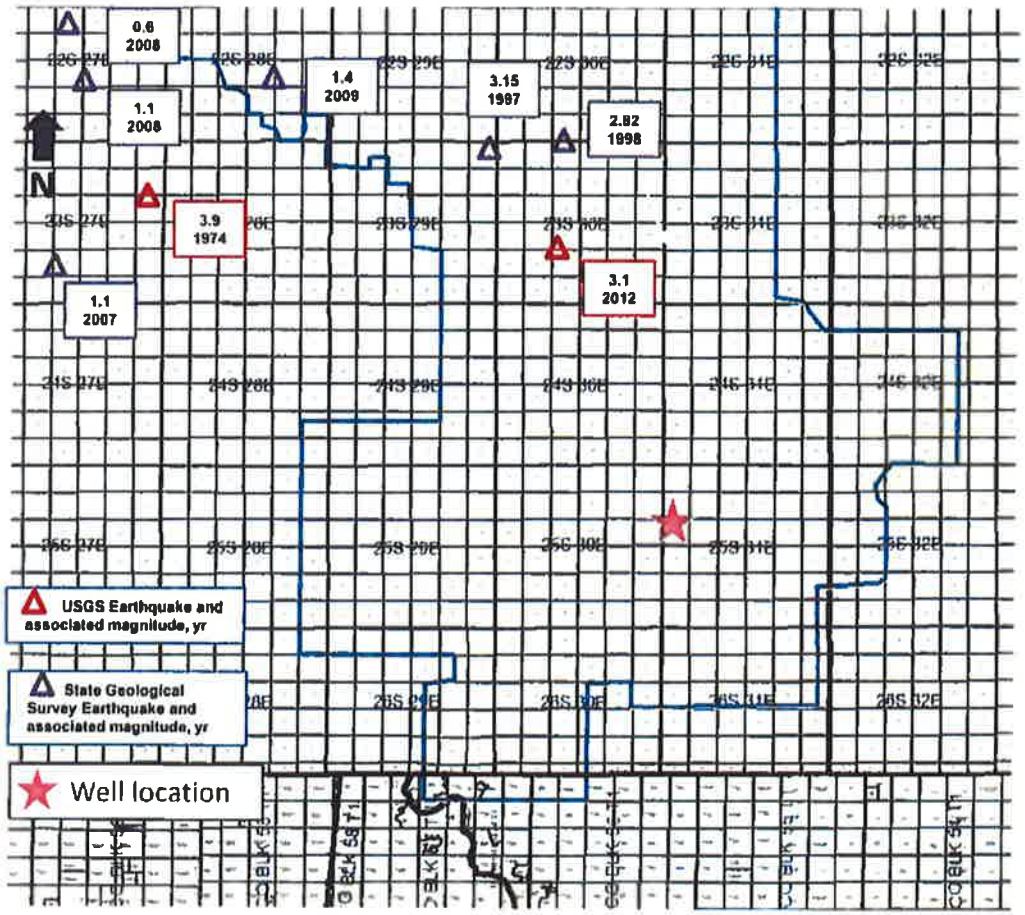
The analysis presented is a screening level approach that encompasses a range of uncertainties in several components that are difficult to individually constrain due to the limited static and dynamic data available for deep disposal wells. Accordingly, the analysis was done by varying key inputs to understand the relative importance of each and guide the focus of future data collection efforts.

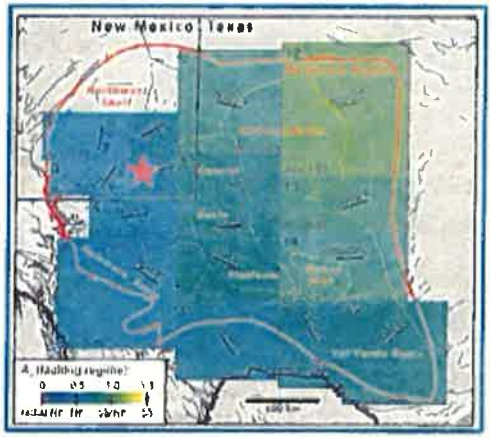
**Monitoring Plan**

To manage the inherent uncertainty, XTO has contracted with a third party to provide seismicity monitoring using public seismometers augmented by a private array in the area of the proposed well. This will allow for a better determination of baseline seismicity as well as early detection should there be anomalous events. Additionally, XTO will determine the original pore pressure of the disposal interval prior to initiating operations. Upon request, XTO will share the results of this work with the EMNRD's UIC staff.

Tim Tyrrell
XTO Geoscience Technical Manager

# PLU Rummy 18 SWD 1 Well – Historic Seismicity and Stress Information



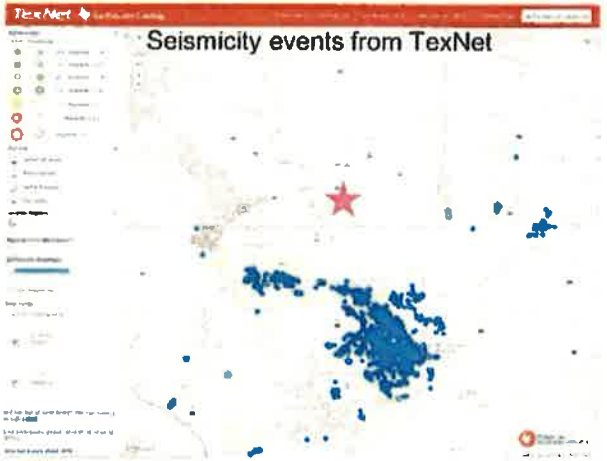




Figure 1

# PLU Rummy 18 SWD 1 Well - Geomechanics

**Stress Regime Inputs**

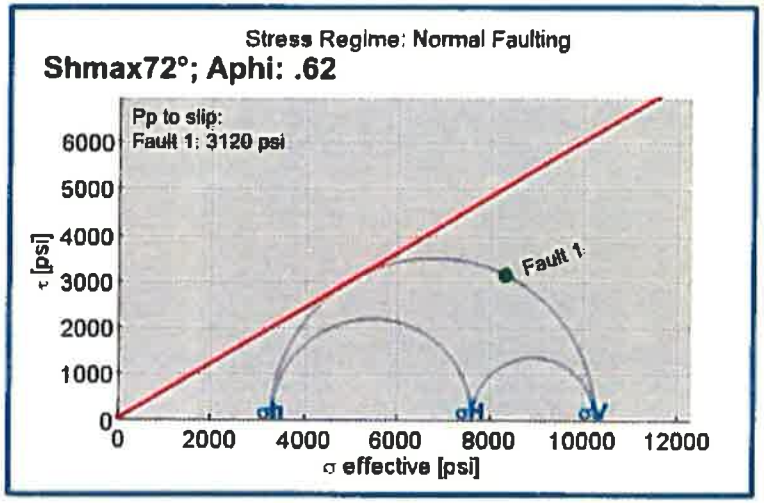
- Use A-Phi Mode

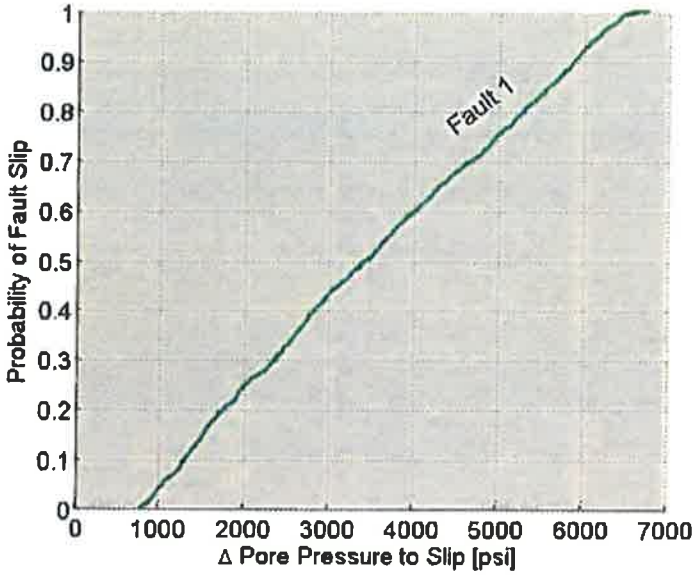
| | |
|---|---|
| Vertical Stress Gradient | 1.1 psi/ft |
| Initial Res. Pressure Gradient | 0.47 psi/ft |
| Reference Depth for Calculations | 16,250 ft MD |

Maximum Injection Rate: 40,000 bbl/day

**Uncertainty Ranges**

| | |
|---|---|
| Strike Angles: | 65° +/- 15° |
| Dip Angles: | 32° +/- 15° |
| Max Horiz Stress: | 72° +/- 15° |
| Friction Coeff Mu: | 0.6 |
| A Phi Parameter: | 0.62 +/- 0.2 |



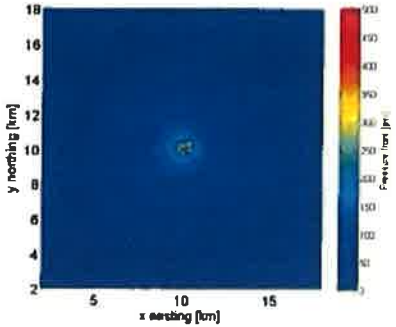



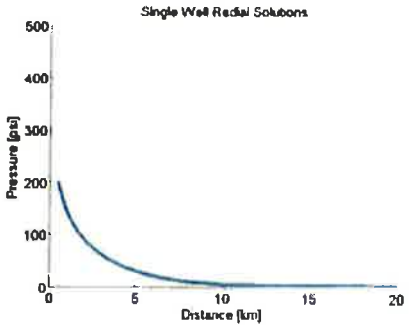

Max Delta PP [psi] 7000

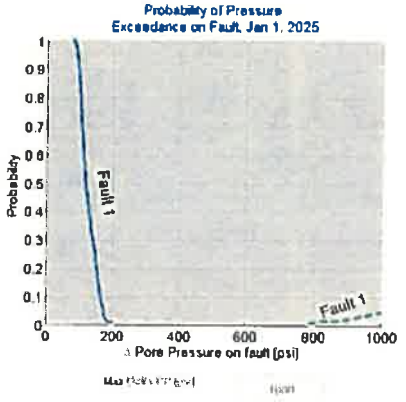
Figure 2

# PLU Rummy 18 SWD 1 Well - Pore Pressure Analysis

2025 Snapshot



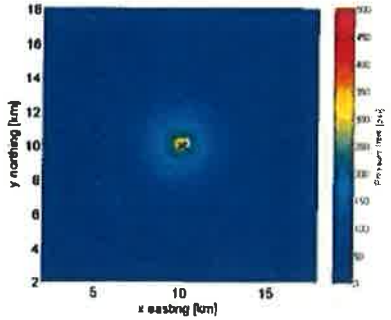



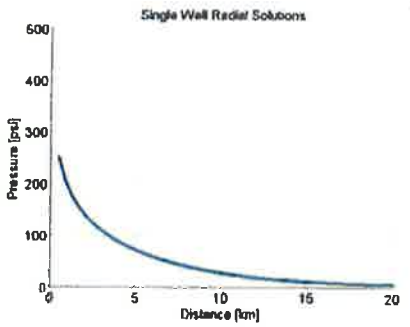




**Uncertainty Ranges**

| | |
|---|---|
| Aquifer Thickness | 750ft +/- 250ft |
| Porosity | 5% +/- 3% |
| Perm | 75 mD +/- 15 mD |

2040 Snapshot



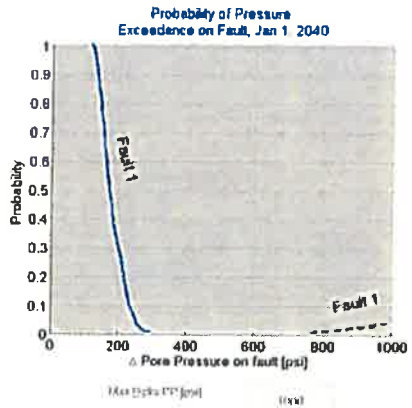
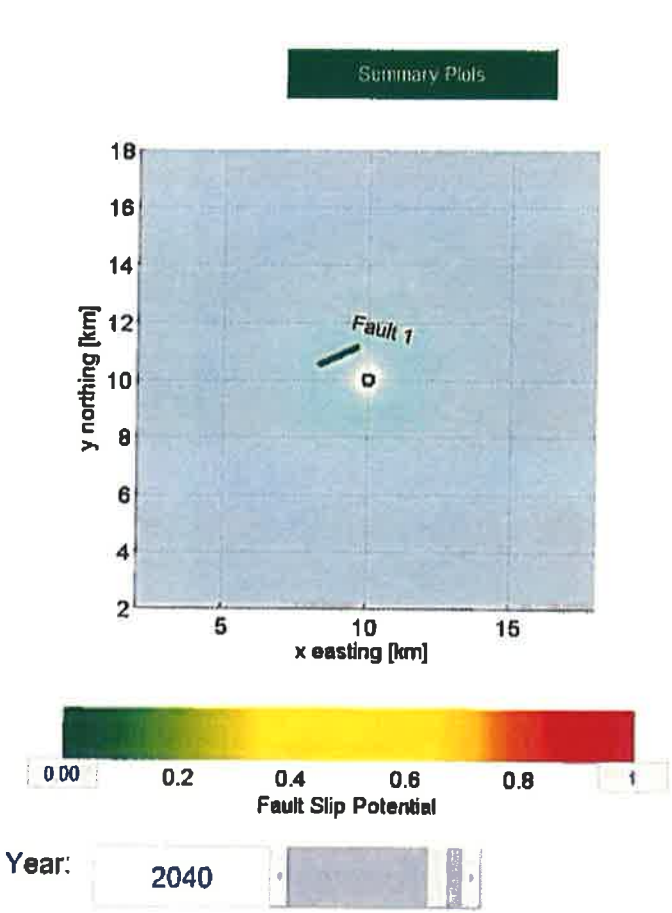
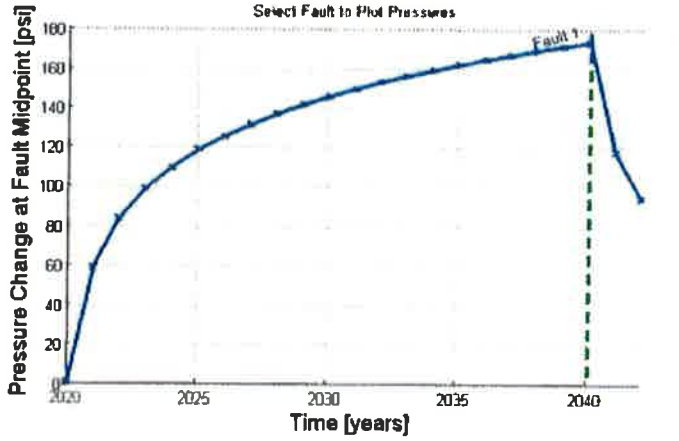




Figure 3

# PLU Rummy 18 SWD 1 Well – Geomechanical / Pore Pressure Integration



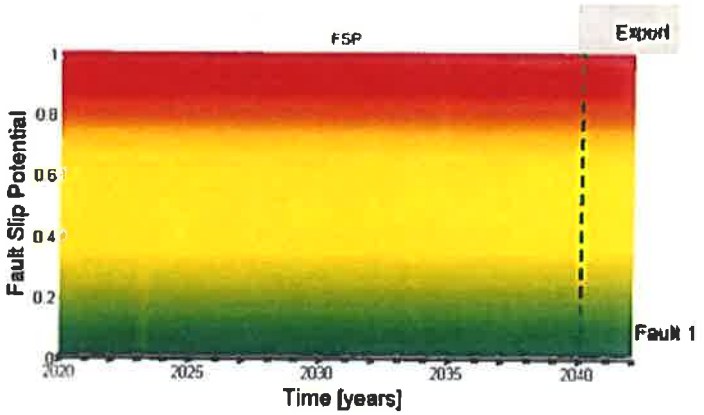




Figure 4