Initial Application Part I

Received: **12/06/2019**

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

4GIDW-191206-C-1080

Revised March 23, 2017

RECEIVED: 12/6/19	REVIEWER: BLL	TYPE: SWD	APP NO: pBL1934053389

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: Probity SWD LLC **OGRID Number:** 296278
Well Name: Tucker Lea 01D **API:** 30-025-xxxxx
Pool: Proposed: 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

SWD-2343

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.

Stuart Doss
Print or Type Name

Signature

Dec. 3, 2019
Date

(432) 215-9707
Phone Number

Stuart@ProbitySWD.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 XXX Disposal _____Storage
Application qualifies for administrative approval? _____Yes _____No

II. OPERATOR: Probity SWD LLC

ADDRESS: PO Box 7307, Midland, TX 79708

CONTACT PARTY: Stuart Doss PHONE: (432) 215-9707

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 ___X__No
If yes, give the Division order number authorizing the project: __N/A_____

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).

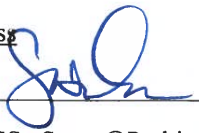
*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

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: Stuart Doss TITLE: Chief Operating Officer

SIGNATURE:  DATE: November 26, 2019

E-MAIL ADDRESS: Stuart@ProbitySWD.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

Side 2

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.

Side 1

INJECTION WELL DATA SHEET

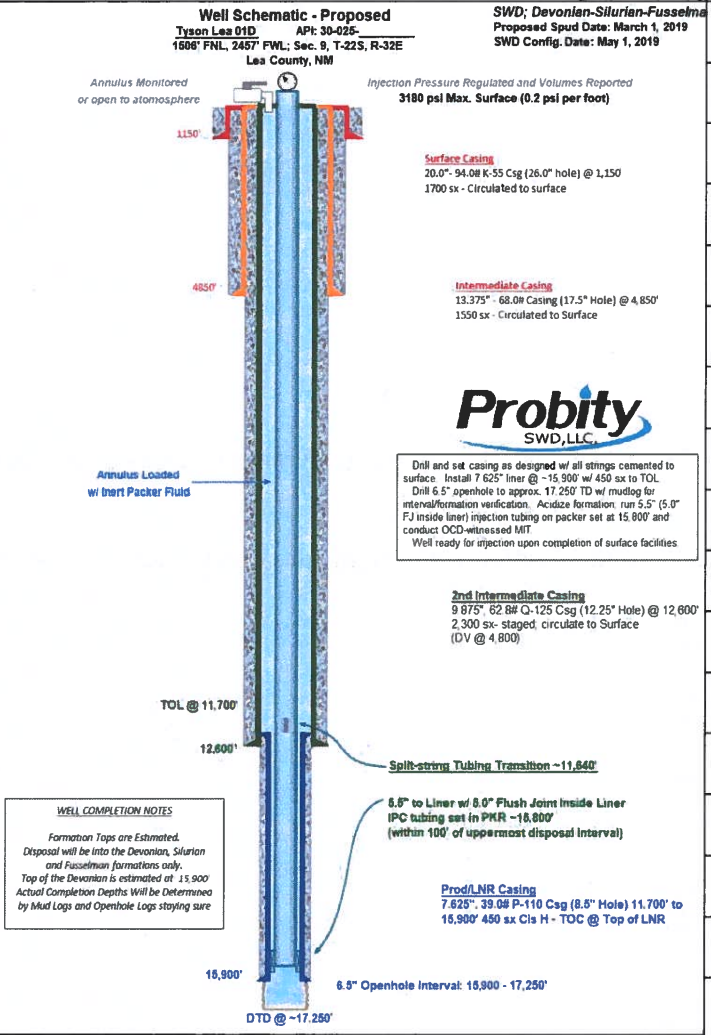
OPERATOR: Probity SWD LLC

WELL NAME & NUMBER: Tyson Lea 01D

WELL LOCATION: 1,506' FNL, 2,457' FW | Unit F | 9 | 22 South | 32

FOOTAGE LOCATION | UNIT LETTER | SECTION | TOWNSHIP | RANGE

WELLBORE SCHEMATIC



WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 26"	Casing Size: 20"
Cemented with: 1,700 sx.	*or* _____ ft³
Top of Cement: 0 TVD (surface)	Method Determined: Circulate to Surface

Intermediate Casing

Hole Size: 17.5"	Casing Size: 13.375" 68#/ft.
Cemented with: 1,550 sx.	*or* _____ ft³
Top of Cement: 0' TVD (surface)	Method Determined: Circulate to Surface

2nd Intermediate Casing

Hole Size: 12.25"	Casing Size: 9.875" Q-125 62.8#/ft.
Cemented with: 2,300 sx.	*or* _____ ft³
Top of Cement: 0' TVD (surface)	Method Determined: Circulate to Surface

Production Casing

Hole Size: 8.5"	Casing Size: 7.625" 39#/ft. P-110
Cemented with: 450 sx	*Or* _____
Top of Cement: 11,700'	Method Determined: Vol. calculated to top of prod/lnr casing.

Injection Interval: 15,900' – 17,250'

Total Depth: 17,250'

Openhole Completion: 15,900' – 17,250'

Side 2

Tubing Size: 5.5" to 5" Lining Material: Internally plastic coated 5.5" above production casing, 5.5" within production casing

Type of Packer: Arrow-set retrievable

Packer Setting Depth: 15,800'

Other Type of Tubing/Casing Seal (if applicable): N/A

Additional Data

1. Is this a new well drilled for injection? Yes
   If no, for what purpose was the well originally drilled? N/A
2. Name of the Injection Formation: Devonian-Silurian
3. Name of Field or Pool (if applicable): 97869
4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used. No (N/A)
5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area: Estimated formation tops in this area:

B/Fresh Water	350'
T/Rustler	1,077'
Delaware Lamar	4,848'
Cherry Canyon	5,758'
Bone Spring	9,523'
Wolfcamp	11,839'
Strawn	13,177'
Atoka	13,637'
Morrow	13,987'
Mississippian	14,797'
Woodford Shale	15,758'
Devonian	15,900'
Fusselman	16,379'
TD Montoya	17,250'
Ellenberger	20,800'

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
30-025-	97869	SWD, Devonian-Silurian

[4] Property Code	[5] Property Name	[6] Well Number
	Tucker Lea	01D

[7] OGRID No.	[8] Operator Name	[9] Elevation
296278	Probity SWD LLC	3774.2'

[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
A	10	22 - S	32 - E		1033'	North	110'	East	Lea

[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.

NWC Section Y=514781.14 N X=745685.04 E	N 1/4 Section Y=514808.32 N X=748327.19 E		NEC Section Y=514835.98 N X=750970.94 E 1,033' 110'
		Surface Hole Location Tucker Lea 01D Y=513802.11 N X=750867.43 E Lat.=32.410680° N Long.=103.654367° W	
W 1/4 Section Y=512140.80 N X=745702.55 E			E 1/4 Section Y=512197.42 N X=750987.72 E
SWC Section Y=509499.98 N X=745721.22 E		S 1/4 Section Y=509530.27 N X=748363.62 E	SEC Section Y=509557.02 N X=751004.60 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 9.26.19 Date

Stuart Doss
Printed Name

Stuart@probitySWD.com
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.

11-22-2019
Date of Survey

Signature and Seal of Professional Surveyor:

JOSHUA A. MCGINN NEW MEXICO 24516 PROFESSIONAL SURVEYOR

Certificate Number

New Mexico Office of the State Engineer

Wells with Well Log Information

UTMNAD83 conversion

No wells found.

Basin/County Search:

County: Lea

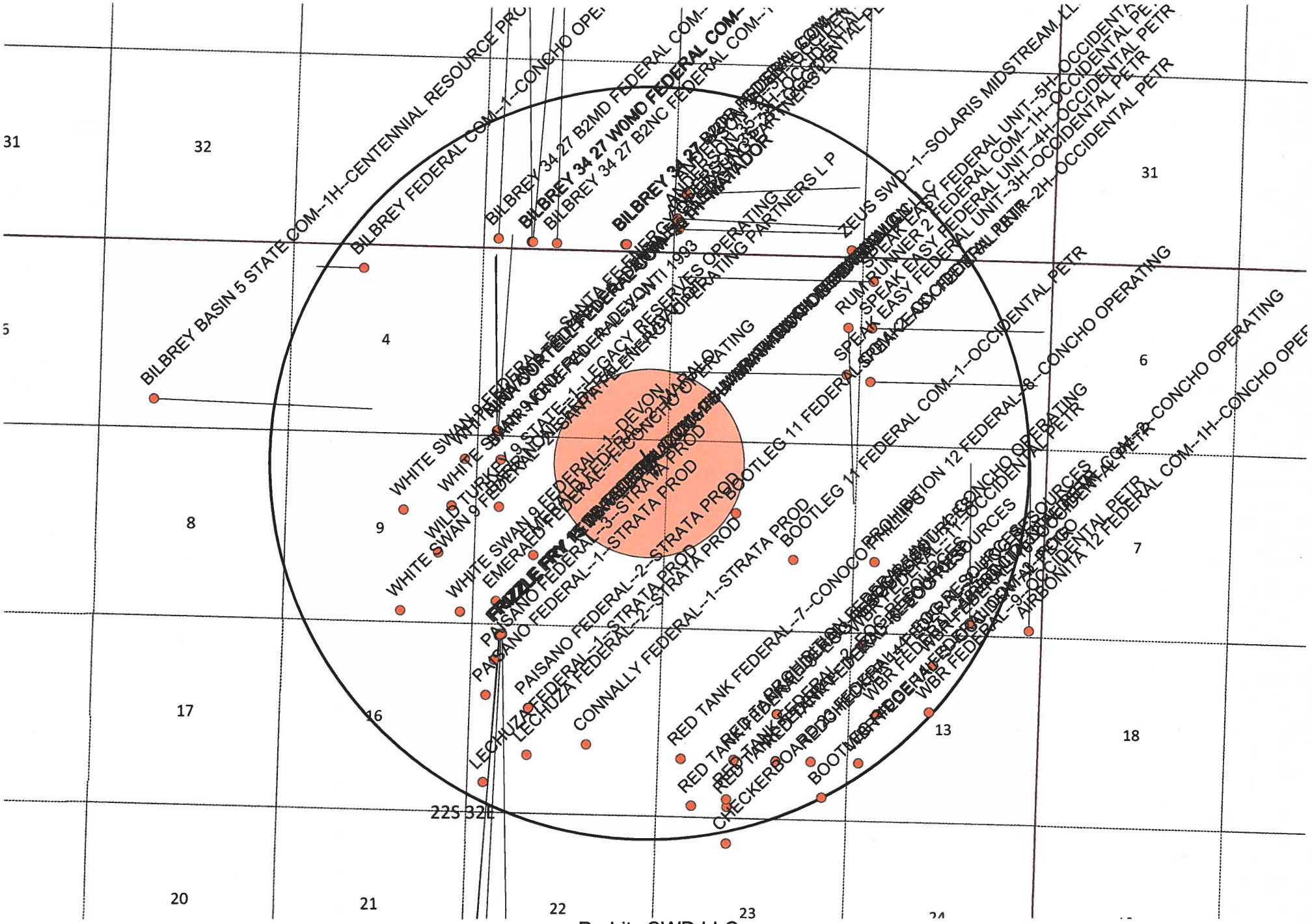
UTMNAD83 Radius Search (in meters):

Easting (X): 552140.184 **Northing (Y):** 3431247.981 **Radius:** 1609.3 (1 mi)

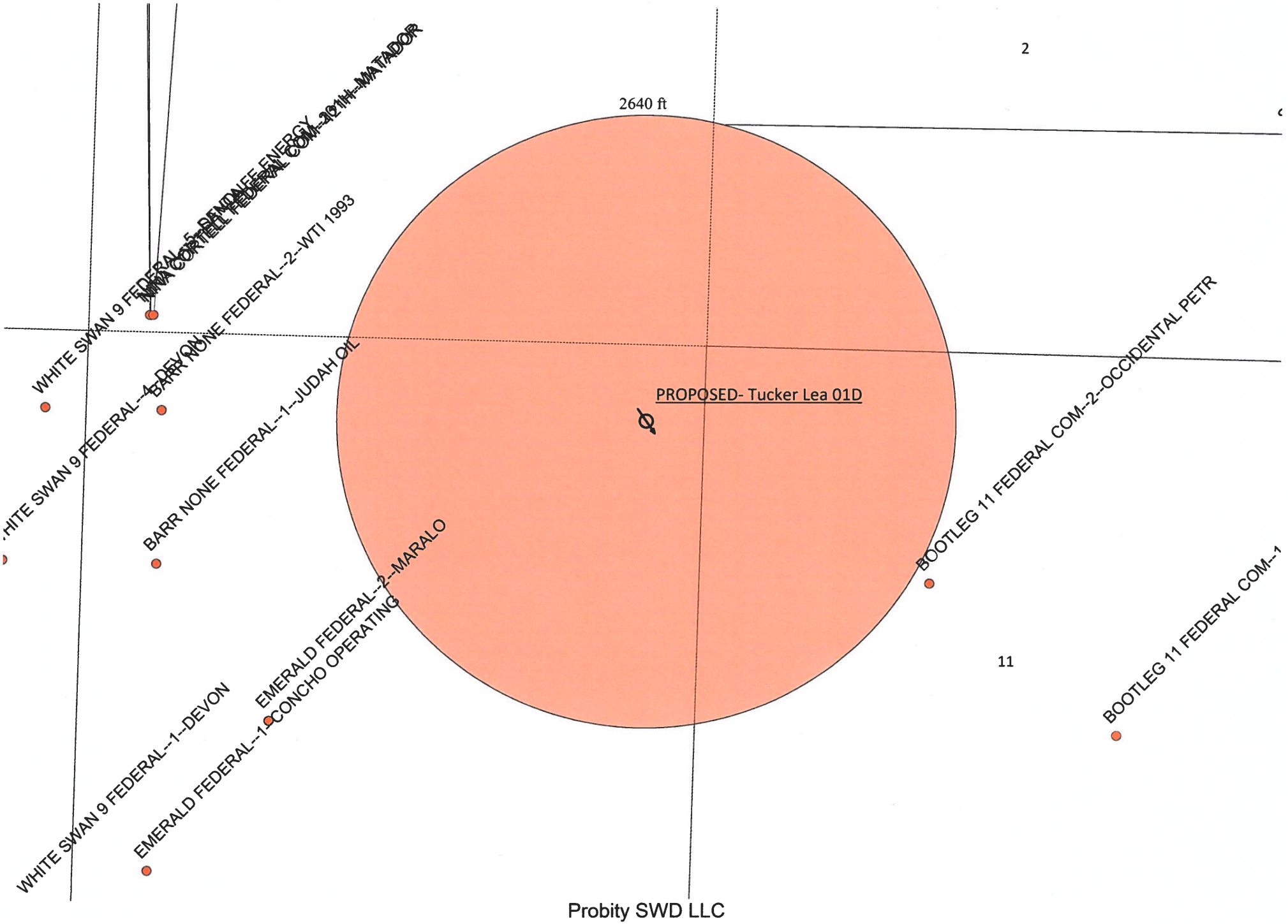
Tucker Lea OLD

Probity SWD LLC

Tucker Lea 01D -- 2 mi View



Tucker Lea 01D -- 1/2 mi View



Probity SWD,LLC.

NOTIFICATION TO INTERESTED PARTIES
via U.S. Certified Mail – Return Receipt Requested

December 3, 2019

To Whom It May Concern:

Probity SWD LLC in Midland, Texas, has made application to the New Mexico Oil Conservation Division to drill and complete a Saltwater Disposal well called in the Devonian-Silurian formation called 'Tucker Lea No. 01D'. The proposed commercial operation will be for disposal-by-injection for operators in the area. As indicated in the notice below, the well is located in Section 10, Township 22 South, Range 32 East in Lea County, New Mexico.

The published notice states that the interval will be from 15,900 feet to 17,250 feet into the Devonian (Silurian) and Fusselman formations.

Please find below the notice published in the Hobbs News-Sun, Hobbs, New Mexico on or about December 6, 2019.

> Probity SWD LLC, PO Box 7307, Midland, TX 79708 is filing form C-108 (Application for Authority to Inject) with the New Mexico Oil Conservation Division seeking administrative approval for a saltwater disposal well. The proposed well, the Tucker Lea No. 01D, will be located 1,033' FNL, 110' FEL, Section 10, Township 22 South, Range 32 East, Lea County, New Mexico. Produced water from area production will be commercially disposed into the Devonian (Silurian) and Fusselman formations at a depth of 15,900' to 17,250' at a maximum surface pressure of 3,180 psi and a rate limited only by such pressure. The proposed SWD well is located approximately 27 mi NE of Loving, NM.
>
> Interested parties wishing to object to the proposed application must file with the New Mexico Oil Conservation Division, 1220 St. Francie Dr., Santa Fe, NM 87505, (505) 476-3460 within 15 days of the date of this notice. Additional information may be obtained from the applicant's agent, PermitsWest (505) 466-8120.

You have been identified as a party who may be interested as an offset lessee or operator, and as such, you are entitled to a full copy of the application. A full copy in PDF format is posted on the Probity SWD LLC DropBox site and is available for immediate download at:
https://www.dropbox.com/sh/c5kb8ulofmpb9gr/AADCX6EKSjDVhBouUbz1p3FZa?dl=0
The link to this file will be active for 30 days from the date of this letter.

If you have questions or concerns, or if you would prefer document delivery by e-mail you may send message me at Stuart@ProbitySWD.com.

Highest Regards,
Probity SWD LLC

Stuart Doss
Chief Operating Officer

example notification letter.

PO Box 7307
Midland, TX 79708
(432) 570-1122

Surface owner

CERTIFIED MAIL® RECEIPT
Domestic Mail Only
For delivery information, visit our website at www.usps.com®
OFFICIAL USE
Certified Mail Fee $3.50
Extra Services & Fees (check box, add fee as appropriate)
Return Receipt (hardcopy) $0.00
Return Receipt (electronic) $0.00
Certified Mail Restricted Delivery $0.00
Adult Signature Required $0.00
Adult Signature Restricted Delivery $
Postage $0.55
Total Postage and Fees $4.05
Sent To F. J. Mills
Street and Apt. No., or PO Box No. 1602 Avenue J.
City, State, ZIP+4® Abernathy, Tx 79311
PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

Neighbor

CERTIFIED MAIL® RECEIPT
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For delivery information, visit our website at www.usps.com®
OFFICIAL USE
Certified Mail Fee $3.50
Extra Services & Fees (check box, add fee as appropriate)
Return Receipt (hardcopy) $0.00
Return Receipt (electronic) $0.00
Certified Mail Restricted Delivery $0.00
Adult Signature Required $0.00
Adult Signature Restricted Delivery $
Postage $0.55
Total Postage and Fees $4.05
Sent To U.S. Dept. of Interior - BLM
Street and Apt. No., or PO Box No. 620 E. Greene St.
City, State, ZIP+4® Carlsbad, NM 88220
PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

Neighbor

7019 1120 0000 0769 2380

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Extra Services & Fees (check box, add fee as appropriate)
Return Receipt (hardcopy) $0.00
Return Receipt (electronic) $0.00
Certified Mail Restricted Delivery $0.00
Adult Signature Required $0.00
Adult Signature Restricted Delivery $
Postage $0.55
Total Postage and Fees $4.05
Sent To State of NM - Bo.I & Gas
Street and Apt. No., or PO Box No. 310 Old Santa Fe Trail
City, State, ZIP+4® Santa Fe, NM 87504
PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

Effected operator

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Return Receipt (hardcopy) $0.00
Return Receipt (electronic) $0.00
Certified Mail Restricted Delivery $0.00
Adult Signature Required $0.00
Adult Signature Restricted Delivery $
Postage $0.55
Total Postage and Fees $4.05
Sent To Occidental Petroleum Corp.
Street and Apt. No., or PO Box No. 5 Greenway Plaza Ste. 110
City, State, ZIP+4® Houston, Tx 77046-0521
PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

Effected operator

7019 1120 0000 0769 2366

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Certified Mail Fee $3.50
Extra Services & Fees (check box, add fee as appropriate)
Return Receipt (hardcopy) $0.00
Return Receipt (electronic) $0.00
Certified Mail Restricted Delivery $0.00
Adult Signature Required $0.00
Adult Signature Restricted Delivery $
Postage $0.55
Total Postage and Fees $4.05
Sent To Chevron USA, Inc.
Street and Apt. No., or PO Box No. 6301 Deauville Rd.
City, State, ZIP+4® Midland, TX 79706
PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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For delivery information, visit our website at www.usps.com®

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Extra Services & Fees (check box, add fee as appropriate)
- Return Receipt (hardcopy) $ $0.00
- Return Receipt (electronic) $ $0.00
- Certified Mail Restricted Delivery $ $0.00
- Adult Signature Required $ $0.00
- Adult Signature Restricted Delivery $

Postage $0.55
Total Postage and Fees $4.05

Postmark Here DEC 4 2019 DOWNTOWN STATION MIDLAND TX 79701-USPS 0702
12/04/2019

Sent To ConocoPhillips
Street and Apt. No., or PO Box No. PO Box 2197
City, State, ZIP+4® Houston, TX 77252-2197

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7019 1120 0000 0769 2335

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Extra Services & Fees (check box, add fee as appropriate)
- Return Receipt (hardcopy) $ $0.00
- Return Receipt (electronic) $ $0.00
- Certified Mail Restricted Delivery $ $0.00
- Adult Signature Required $ $0.00
- Adult Signature Restricted Delivery $

Postage $0.55
Total Postage and Fees $4.05

Postmark Here DEC 4 2019 DOWNTOWN STATION MIDLAND TX 79701-USPS 0702
12/04/2019

Sent To Matador Resources
Street and Apt. No., or PO Box No. 5400 LBJ Fwy Ste. 1500
City, State, ZIP+4® Dallas, TX 75240

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

Effected operators

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- Certified Mail Restricted Delivery $ $0.00
- Adult Signature Required $ $0.00
- Adult Signature Restricted Delivery $

Postage $0.55
Total Postage and Fees $4.05

Postmark Here DEC 4 2019 DOWNTOWN STATION MIDLAND TX 79701-USPS 0702
12/04/2019

Sent To WPX Energy Permian
Street and Apt. No., or PO Box No. 210 Park Ave. Ste. 700
City, State, ZIP+4® Oklahoma City, OK 73102

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7019 1120 0000 0769 2304

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Certified Mail Fee $3.50
Extra Services & Fees (check box, add fee as appropriate)
- Return Receipt (hardcopy) $ $0.00
- Return Receipt (electronic) $ $0.00
- Certified Mail Restricted Delivery $ $0.00
- Adult Signature Required $ $0.00
- Adult Signature Restricted Delivery $

Postage $0.55
Total Postage and Fees $4.05

Postmark Here DEC 4 2019 DOWNTOWN STATION MIDLAND TX 79701-USPS 0702
12/04/2019

Sent To U.S. Energy Dev. Corp.
Street and Apt. No., or PO Box No. 1521 N. Cooper St. Ste 400
City, State, ZIP+4® Arlington, Tx 76011

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

Affidavit of Publication

STATE OF NEW MEXICO
COUNTY OF LEA

I, Daniel Russell, Publisher of the Hobbs News-Sun, a newspaper published at Hobbs, New Mexico, solemnly swear that the clipping attached hereto was published in the regular and entire issue of said newspaper, and not a supplement thereof for a period of 1 issue(s).

Beginning with the issue dated
December 06, 2019
and ending with the issue dated
December 06, 2019.

Publisher

Sworn and subscribed to before me this
6th day of December 2019.

Business Manager

My commission expires
January 29, 2023
(Seal)

OFFICIAL SEAL
GUSSIE BLACK
Notary Public
State of New Mexico
My Commission Expires 1-29-23

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937 and payment of fees for said

LEGAL LEGAL

LEGAL NOTICE
DECEMBER 6, 2019

Probity SWD LLC, PO Box 7307, Midland, TX 79708 is filing form C-108 (Application for Authority to Inject) with the New Mexico Oil Conservation Division seeking administrative approval for a saltwater disposal well. The proposed well, the Tucker Lea No. 01D, will be located 1,033' FNL, 110' FEL, Section 10, Township 22 South, Range 32 East, Lea County, New Mexico. Produced water from area production will be commercially disposed into the Devonian (Silurian) and Fusselman formations at a depth of 15,900' to 17,250' at a maximum surface pressure of 3,180 psi and a rate limited only by such pressure. The proposed SWD well is located approximately 27 mi NE of Loving, NM.

Interested parties wishing to object to the proposed application must file with the New Mexico Oil Conservation Division, 1220 St. Francis Dr., Santa Fe, NM 87505, (505) 476-3460 within 15 days of the date of this notice. Additional information may be obtained from the applicant's agent, PermitsWest (505) 466-8120.

AND

Probity SWD LLC, PO Box 7307, Midland, TX 79708 is filing form C-108 (Application for Authority to Inject) with the New Mexico Oil Conservation Division seeking administrative approval for a saltwater disposal well. The proposed well, the Tyson Lea No. 01D, will be located 1,506' FNL, 2,457' FWL, Section 9, Township 22 South, Range 32 East, Lea County, New Mexico. Produced water from area production will be commercially disposed into the Devonian (Silurian) and Fusselman formations at a depth of 15,900' to 17,250' at a maximum surface pressure of 3,180 psi and a rate limited only by such pressure. The proposed SWD well is located approximately 26 mi NE of Loving, NM.

Interested parties wishing to object to the proposed application must file with the New Mexico Oil Conservation Division, 1220 St. Francis Dr., Santa Fe, NM 87505, (505) 476-3460 within 15 days of the date of this notice. Additional information may be obtained from the applicant's agent, PermitsWest at (505) 466-8120.
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PROBITY SWD, LLC
PO BOX 7307
MIDLAND, TX 79708

Seismic Risk Assessment

Probity SWD, LLC

Tucker Lea No. 01D

Section 10, Township 22 South, Range 32 East

Lea County, New Mexico

Cory Walk

Cory Walk

B.S., M.S.

Geologist

Permits West Inc.

November 26, 2019

GENERAL INFORMATION

Tucker Lea #01D is located in the NE 1/4, section 10, T22S, R32E, about 27 miles northeast of Loving, NM in the Permian Basin. Probity SWD proposes the injection zone to be within the Devonian-Silurian formation through an open hole from 15,900'-17,250' below ground surface. This report assesses any potential concerns relating to induced seismicity along deep penetrating Precambrian faults or the connection between the injection zone and known underground potable water sources.

SEISMIC RISK ASSESSMENT

Historical Seismicity

Searching the USGS earthquake catalog resulted in no (0) earthquakes above a magnitude 2.5 within 6 miles (9.7 km) of the proposed deep disposal site since 1970 (Fig. 1). The nearest earthquake occurred in 1984 about 11.5 miles (~18.5 km) southeast of the proposed Tucker Lea SWD site and had a magnitude of 2.9.

Basement Faults and Subsurface Conditions

A structure contour map (Fig. 1) of the Precambrian basement shows the Tucker Lea #01D is approximately 8 miles from the nearest basement-penetrating fault inferred by Ewing et al (1990). **Information about nearby faults based on GIS data from Ruppel et al. (2009) is listed in Table 1.**

Snee and Zoback (2018) state, "In the western part of Eddy County, New Mexico, S_{Hmax} is ~north-south (consistent with the state of stress in the Rio Grande Rift; Zoback and Zoback, 1980) but rotates to ~east-northeast-west-southwest in southern Lea County, New Mexico and the northernmost parts of Culberson and Reeves counties, Texas." **Around the Tucker Lea SWD site, Snee and Zoback indicate a S_{Hmax} direction of N075°E and an A_ϕ of 0.60, indicating an extensional (normal) stress regime.**

Induced seismicity is a growing concern of deep SWD wells. Relatively new software developed by the Stanford Center for Induced and Triggered Seismicity allows for the probabilistic screening of deeply penetrating faults near the proposed injection zone (Walsh et al., 2016; Walsh et al., 2017). This software uses parameters such as stress orientations, fault strike/dip, injection rates, fault friction coefficients, etc. to estimate the potential for fault slip. Using the best available data as input parameters (Table 2), the Fault Slip Potential (FSP) models suggest a zero (0.00) percent chance of slip on nearby faults, inferred by Frenzel et al (1988) and Ewing et al. (1990), through the year 2040 (Fig. 2; Table 1). **This model also suggests a pore pressure increase of 10.1 psi on the nearest fault (Fault 13; Fig. 3; Table 1) by the year 2042.** Geomechanical modeling shows that the primary fault of concern (fault 14) would need a pressure increase of 3220 psi in order to reach a 100% probability of slip on the fault. Even a 50% probability requires an increase of 1100 psi which is far greater than the modeled increase of 10.1 psi (Fig. 3).

GROUNDWATER SOURCES

Quaternary Alluvium acts as the principal aquifer used for potable ground water near the Tucker Lea #01D location (Hendrickson and Jones, 1952). Nicholson and Clebsch (1961) state, "Potable ground water is not available below the Permian and Triassic unconformity but, because this boundary is not easily defined, the top of the Rustler anhydrite formation is regarded as the effective lower limit of 'potable' ground water." Around the Tucker Lea #01D, the top of a thick anhydrite unit interpreted to represent the Rustler Formation lies at a depth of ~1070 feet bgs.

STRATIGRAPHY

Thick permeability barriers exist above (Woodford shale; 165 ft thick) and below (Simpson Group; 525 ft thick) the targeted Devonian-Silurian injection zone (Plate 2, Comer et al., 1991; Fig. 8, Frenzel et al., 1988). Well data indicates approximately 14,830 ft of rock separating the top of the Devonian from the previously stated lower limit of potable water at the top of the Rustler anhydrite formation.

CONCLUDING STATEMENT

After examination of publically available geologic and engineering data, there is no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

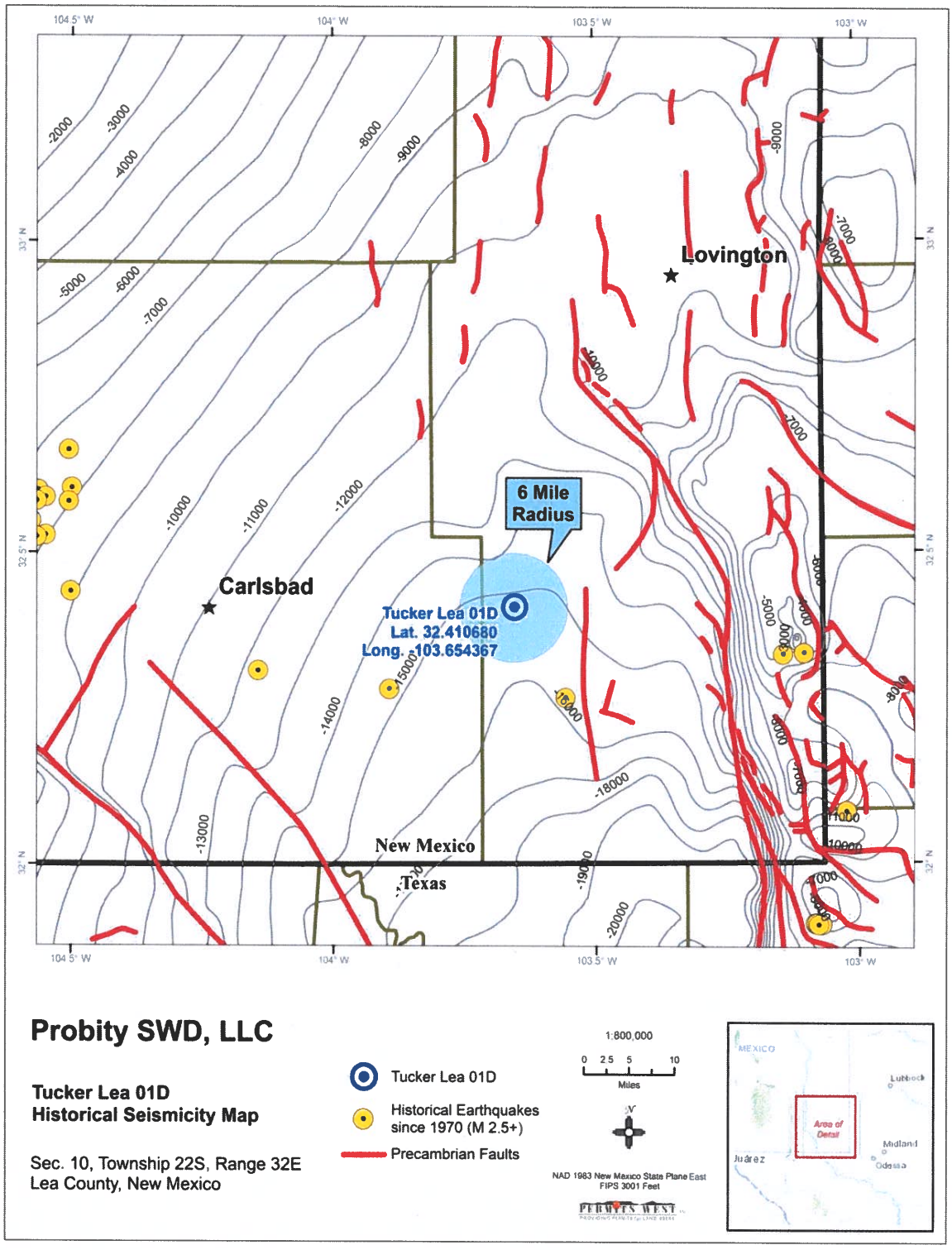

Figure 1. Structural contour map of the Precambrian basement in feet below sea level. Red lines represent the locations of Precambrian basement-penetrating faults (Ewing et al., 1990). The Tucker Lea #01D well lies ~8 miles west of the closest deeply penetrating fault and ~11.5 miles northwest from the closest historic earthquake.

Table 1: Nearby Basement Fault Information

ID	Distance from proposed Tucker Lea SWD (mi)	Strike (°)	Dip (°)	FSP	Pore Pressure change after 20 years (psi)
Fault 13	8.1	359	50-90	0.00	10.1
Fault 14	12.2	27	50-90	0.00	2.0

Table 2: Fault Slip Potential model input parameters

Faults	Value	Notes
Friction Coefficient	0.58	Ikari et al. (2011)
Dip Angle (deg)	70	Snee and Zoback (2018)
Stress		
Vertical stress gradient (psi/ft)	1.1	Hurd and Zoback (2012)
Max Horizontal Stress Direction (deg)	75	Snee and Zoback (2018)
Depth for calculations (ft)	17000	Proposed injection zone
Initial Reservoir Pressure Gradient (psi/ft)	0.7	calculated from mud wt (ppg) used in drilling at these depths
A Phi Parameter	0.60	Snee and Zoback (2018)
Reference Friction Coefficient	0.58	Ikari et al. (2011)
Hydrology		
Aquifer thickness (ft)	1300	Proposed injection zone
Porosity (%)	6	
Permeability (mD)	150	
Injection Rate (bbl/day)	30000	Maximum proposed injection rate

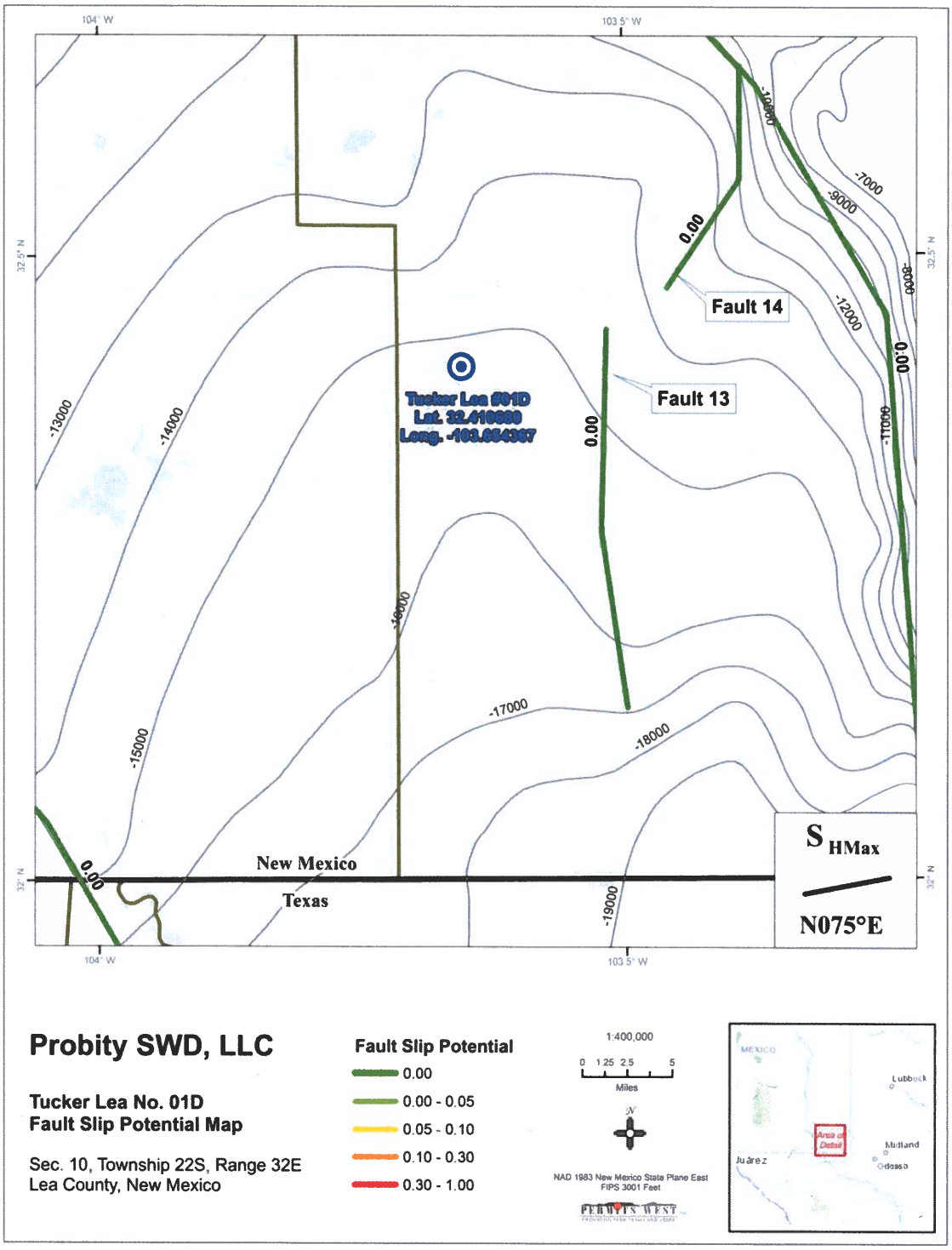

Figure 2. Precambrian fault map of Carlsbad, NM area as mapped by Ewing et al. (1990). Faults are colored based on probability of fault slip as modeled using Fault Slip Potential software (Walsh and Zoback, 2016). Labeled values represent the calculated fault slip potential using the parameters indicated in Table 2. Contours show the top of the Precambrian basement in feet below sea level.

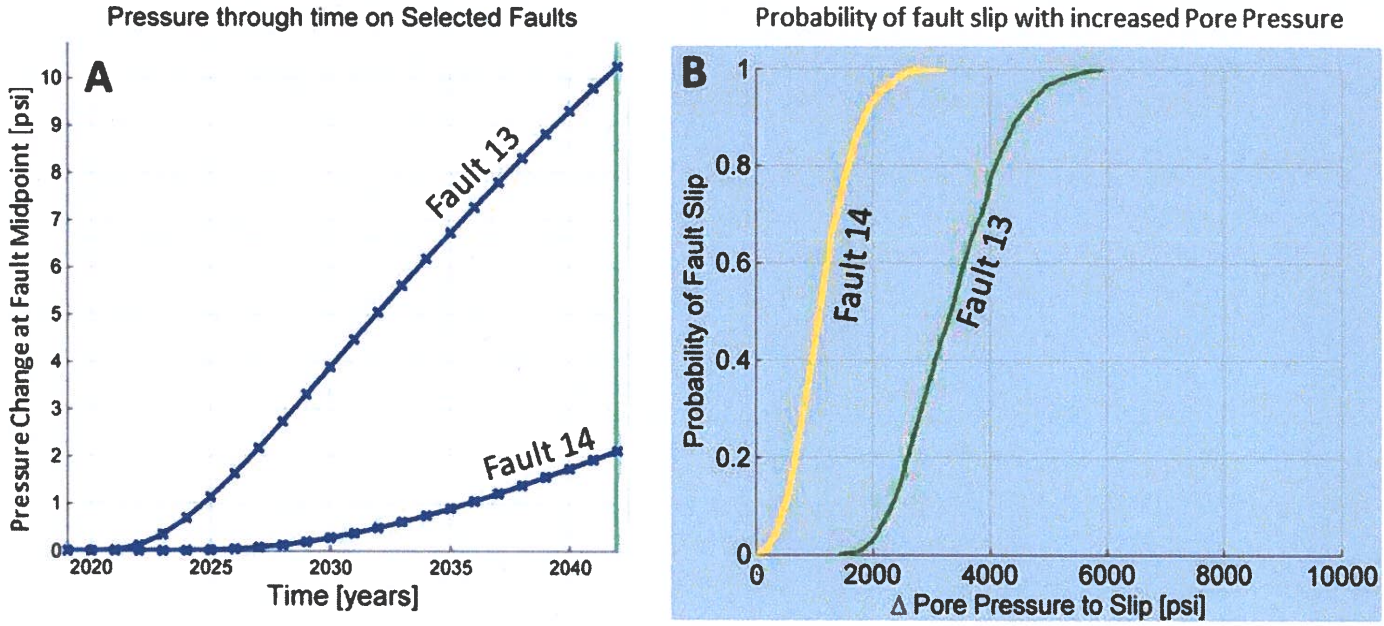

Figure 3. A) Plot showing the modeled change of pore pressure on faults 13 and 14 through time as a response to the proposed SWD well. B) Plot showing the required pore pressure increase needed to produce specific probabilities of fault slip on faults 13 and 14.

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