RECEIVED: 04/25/2019	REVIEWER:	TYPE: SWD	APP NO: pWVJ1911557794

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: Trove Energy and Water, LLC **OGRID Number:** 372488
Well Name: WLC South Federal SWD No.1 **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

SWD-2066

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.

Ben Stone
Print or Type Name

Signature

4/25/2019
Date

903-488-9850
Phone Number

ben@sosconsulting.us
e-mail Address

April 25, 2019

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

Attn: Ms. Adrienne Sandoval, Director

Re: Application of Trove Energy and Water, LLC to permit for salt water disposal the proposed WLC South Federal SWD No.1, located in Section 15, Township 26 South, Range 33 East, NMPM, Lea County, New Mexico.

Dear Ms. Sandoval,

Please find the enclosed form C-108 Application for Authority to Inject, supporting the above-referenced request for salt water disposal. The well will be operated as a commercial endeavor offering operators in the area additional options for produced water disposal.

Trove Energy and Water is a developing salt water disposal services to operators in southeast New Mexico and seeks to optimize efficiency, both economically and operationally, of all its operations. Approval of this application is consistent with that goal as well as the NMOCD's mission of preventing waste and protection of correlative rights.

This application for a proposed Devonian SWD interval includes the currently mandated increased One-Mile Area of Review including pertinent and available seismic information for the area and region. Published legal notice ran April 7, 2019 in the Hobbs News-Sun and all offset operators and other affected parties have been notified individually. The legal notice affidavit is included with this application. The application also includes a wellbore schematic, area of review maps, affected party plat and other required information for a complete Form C-108. The well is located on federal surface and minerals and the Bureau of Land Management CFO and offset operators have been notified of this application.

I respectfully request that the approval of this salt water disposal well proceed swiftly and if you or your staff requires additional information or has any questions, please do not hesitate to call or email me.

Best regards,

Ben Stone, Partner
SOS Consulting, LLC
Agent for Trove Energy and Water, LLC

Cc: Application attachment and file

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: ***Salt Water Disposal*** and the application ***QUALIFIES*** for administrative approval.

II. OPERATOR: ***Trove Energy and Water, LLC***
ADDRESS: ***1919 North Turner, Hobbs, NM 88240***

CONTACT PARTY: ***Agent: SOS Consulting, LLC – Ben Stone (903) 488-9850***

III. WELL DATA: ***All well data and applicable wellbore diagrams are ATTACHED.***

IV. ***This is not an expansion of an existing project.***

V. ***A map is attached*** that identifies all wells and leases within two miles of any proposed injection well with a ***ONE-Mile*** radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

*VI. A tabulation is attached of data on all wells of public record within the area of review which penetrate the proposed injection zone. ***There are NO (0) Wells in the subject AOR which Penetrate the proposed Devonian interval.*** The data includes a description of each well's type, construction, date drilled, location, depth, and a schematic of any plugged well illustrating all plugging detail. ***NO P&A Wells penetrate.***

VII. ***The following data is ATTACHED*** 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. ***Appropriate geologic data on the injection zone is ATTACHED*** 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. ***Stimulation program – a conventional acid job may be performed to clean and open the formation.***

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

*XI. ***There are NO water wells/ PODs within one mile of the proposed salt water disposal well. Representative analyses are ATTACHED.***

XII. ***An affirmative statement is ATTACHED that available geologic and engineering data has been examined and no evidence was found*** of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

XIII. ***"Proof of Notice" section on the next page of this form has been completed and ATTACHED. There are 3 offset lessees and/or mineral owners within 1 mile and state and federal minerals - all have been noticed. Well location is Federal.***

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: ***Ben Stone*** TITLE: ***SOS Consulting, LLC agent for Trove Energy and Water, LLC***

SIGNATURE: _____ DATE: ***4/25/2019***

E-MAIL ADDRESS: ***ben@sosconsulting.us***

* 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

FORM C-108 – APPLICATION FOR AUTHORIZATION TO INJECT (cont.)

III. WELL DATA – ***The following information and data is included (See ATTACHED Wellbore Schematic):***

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 ***pursuant to the following criteria is ATTACHED.***

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.

C-108 - Items III, IV, V

Item III - Subject Well Data

Wellbore Diagram - PROPOSED

Item IV – Tabulation of AOR Wells

NO wells penetrate the proposed injection interval.

Item V – Area of Review Maps

1. Two Mile AOR Map with One-Mile Fresh Water Well Radius

2. One-Half Mile AOR Map

All Above Exhibits follow this page.

WELL SCHEMATIC - PROPOSED
WLC South Federal SWD Well No.1

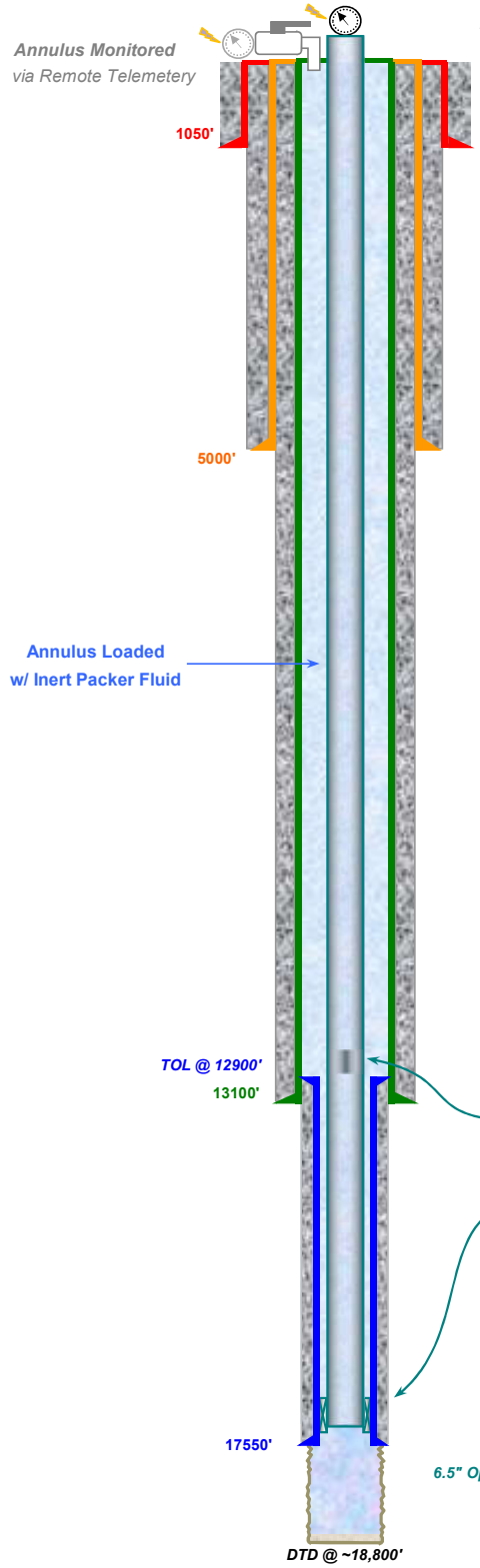
TROVE ENERGY and WATER

API 30-025-xxxxx
900' FNL & 100' FEL, SEC. 15-T26S-R33E
LEA COUNTY, NEW MEXICO

SWD; Devonian-Silurian (97869)
Spud Date: 1/02/2020
SWD Config Dt: 2/15/2020

Generalized Tops

0
1000 RSTLR: 1000'
2000
3000
4000 B/SLT: 4600'
5000 DEL: 4950'
6000 CHRY CN: 6050'
7000
8000
9000 BN SPRG: 8980'
10000
11000 3rd BN SPRG: 11750'
12000 WLFC: 12250'
13000 STRWN: 14180'
14000 ATKA: 14900'
15000 BRNTT: 15500'
16000 MISS: 16550'
17000 WDFD SH: 17100' DEV: 17550'
18000 FUSS: 18700'



Injection Pressure Regulated and Volumes Reported
3510 psi Max. Surface (0.2 psi per foot)

Surface Casing
20.0", 94.0# J-55 Csg. (26.0" Hole) @ 1050'
1600 sx - Circulated to Surface

Intermediate Casing
13.375", 68.0# Csg. (17.5" Hole) @ 5000'
3200 sx - Circulated to Surface

Trove Energy & Water, LLC

Drill and set casing as designed w/ all strings cemented to surface. Install 7.625" liner @ ~17,550 w/ 475 sx to TOL. Drill 6.5" openhole to approx. 18,800' TD w/ mudlog for interval/ formation verification. Acidize formation; run 5.5" (5.0" FJ inside liner) injection TBG on PKR set at 17,450'.+ Conduct OCD witnessed MIT. Well ready for injection upon completion of surface facilities.

Production Casing
9.625", 53.5# P-110 Csg. (12.25" Hole) @ 13100'
3400 sx - Staged; Circulate to Surface
(DV @ 7800')

Split String Tubing Transition ~12840'

5.5" Tubing w/ 5.0" Flush Joint inside liner
IPC Tubing set in PKR ~17,450'
(Within 100' of Uppermost Disposal Interval)

Liner Casing
7.625", 39.0# P-110 Csg (8.5" Hole) 12900' to 17,550'
475 sx Cls H - TOC @ Top of LNR

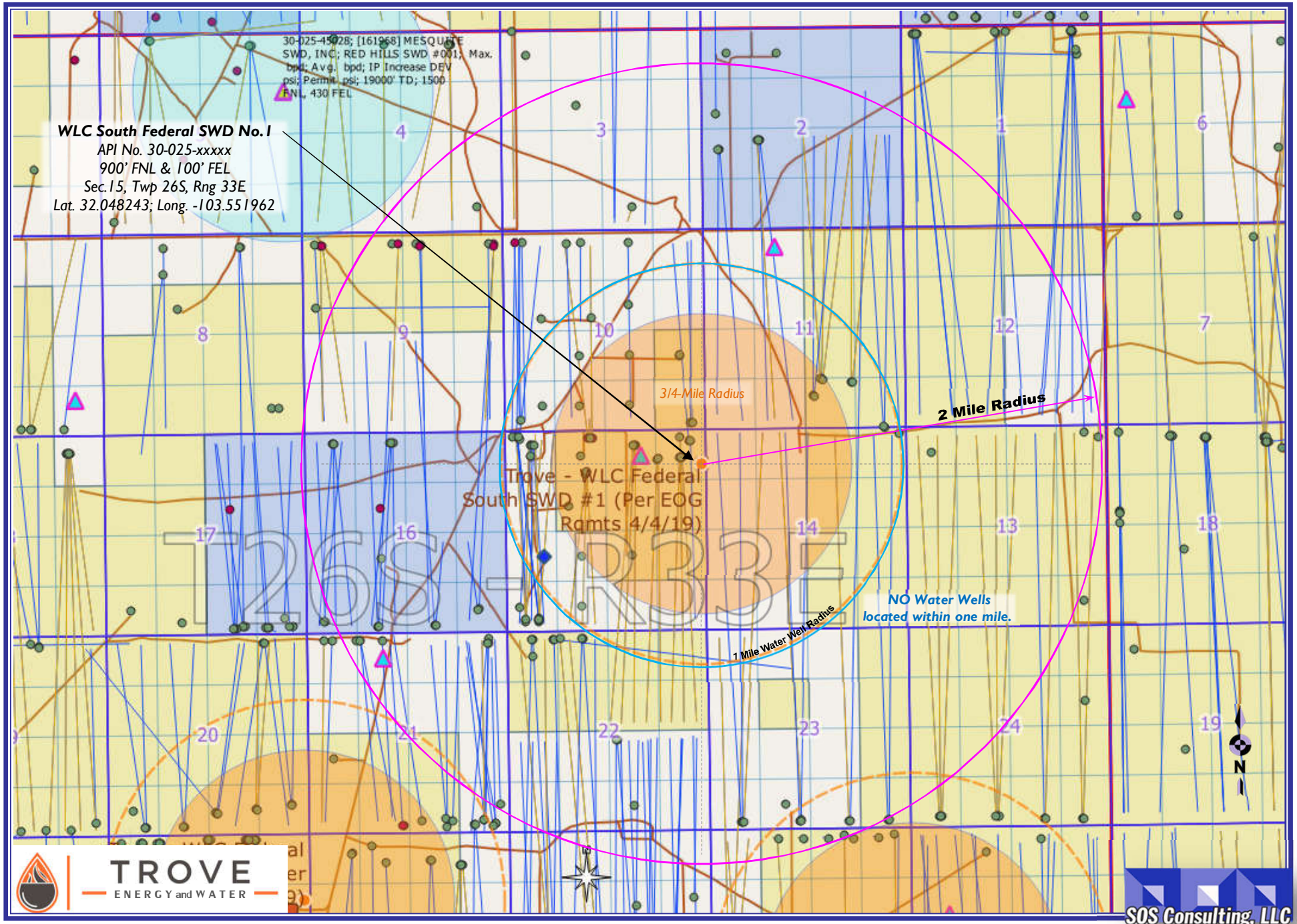
6.5" Openhole Interval: 17,550' to 18,800' (Maximum)

Drawn by: Ben Stone, 4/25/2019

SOS Consulting, LLC

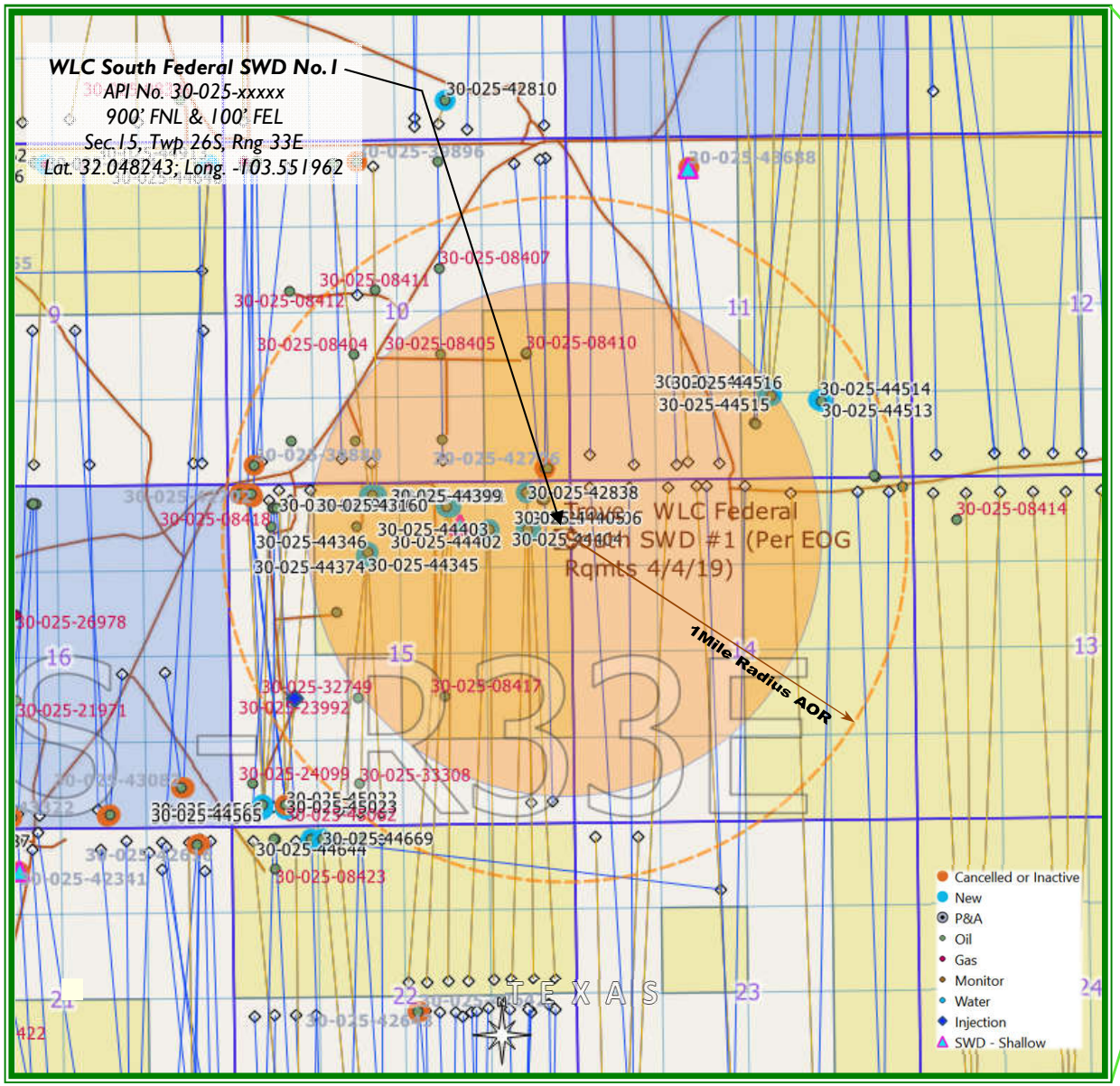
WLC South Federal SWD No.1 - Area of Review / 2 Miles

(Attachment to NMOCD Form C-108 - Item V)

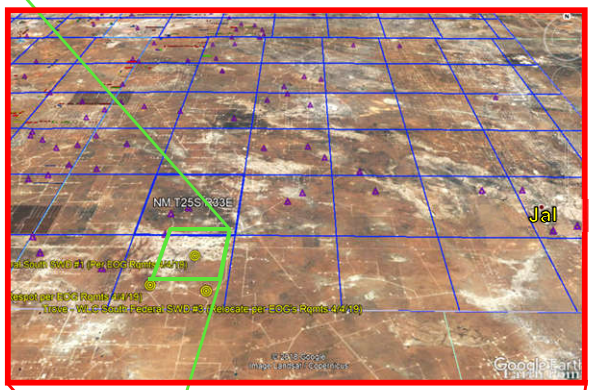


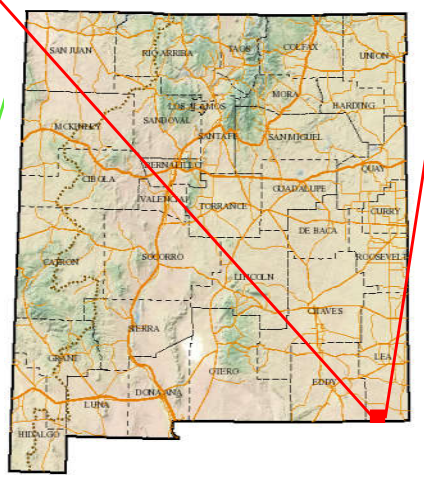
WLC South Federal SWD Well No.1 – One Mile Area of Review / Overview Map

(Attachment to NMOCD Form C-108, Application for Authority to Inject.)



21.7 miles W/SW of Jal, NM





Lea County, New Mexico

TROVE ENERGY and WATER

SOS Consulting, LLC

C-108 - Item VI

Area of Review Well Data

THERE ARE NO WELLS WHICH PENETRATE THE PROPOSED DEVONIAN FORMATION IN THE ONE-HALF MILE AREA of REVIEW

C-108 ITEM X

LOGS and AVAILABLE TEST DATA

A Standard Suite of Logs will be run after drilling the well and submitted to the Division.

C-108 ITEM VII – PROPOSED OPERATION

Note: All Trove Energy and Water WLC South SWD Prospects were vetted with EOG Review Team.

Trove WLC South Federal SWD #1

Commercial SWD Facility

Upon approval of all permits for SWD, operations would begin within 30 days. Completion of the well operations will take approximately 6-8 weeks. Facility construction including installation of the tank battery, berms, plumbing and other and associated equipment would be occurring during the same interval but at a different location from the well. In any event, it is not expected for the construction phase of the project to last more than 60 days, depending on availability of contractors and equipment.

Configure for Salt Water Disposal

Prior to commencing any work, an NOI sundry(ies) will be submitted to configure the well for SWD and will detail the completion workover including all work otherwise described above, any change to the procedure noted herein and to perform mechanical integrity pressure test per OCD test procedures. (Notify NMOCD 24 hours prior.) The casing/tubing annulus will be monitored for communication with injection fluid or loss of casing integrity.

Operational Summary

The SWD facility will not be fenced so that trucks may access for load disposal 24/7.

Future plans would include tying the SWD into a pipeline so the well and injection equipment will be a closed system and equipped with pressure limiting devices and volume meters. The annulus, loaded with an inert, anti-corrosion packer fluid, will be monitored for pressure.

The facility and tanks will be equipped with telemetry devices and visual alarms to alert the operator and customers of full tanks or an overflow situation.

Anticipated daily maximum volume is 30,000 bpd and an average of 17,500 bpd at a maximum surface injection pressure of 3510 psi (.2 psi/ft gradient – maximum pressure will be adjusted If the top of interval is modified after well logs are run).

Potential releases will be contained and cleaned up immediately. The operator shall repair or otherwise correct the situation within 48 hours before resuming operations. OCD will be notified within 24 hours of any release greater than 5 bbls. If required, remediation will start as soon as practicable. Operator shall comply with 19.15.29 NMAC and 19.15.30 NMAC; as necessary and appropriate and OCD form C-141 will be submitted promptly.

C-108 ITEM VII – PRODUCED WATER ANAYLSES

Item VII.4 – Water Analysis of Source Zone Water

Delaware
Bone Spring
Wolfcamp

Item VII.5 – Water Analysis of Disposal Zone Water

Devonian

Water Analyses follow this page.

C-108 Item VII.5 - Produced Water Data

Trove Energy & Water, LLC - WLC Mid Federal Project Area

SOURCE ZONE

DELAWARE

Lab ID

Sample ID 5532

API No 3001510181

Sample No

Well Name SUPERIOR STATE 002

Location ULSTR 08 25 S 30 E **Lat / Long** 32.14281 -103.89616

1980 S 660 E **County** Eddy

Operator (when sampled)

Field CORRAL CANYON Unit I

Sample Date Analysis Date

Sample Source SWAB Depth (if known)

Water Typ

ph		alkalinity_as_caco3_mgL	
ph_temp_F		hardness_as_caco3_mgL	
specificgravity		hardness_mgL	
specificgravity_temp_F		resistivity_ohm_cm	
tds_mgL	155173	resistivity_ohm_cm_temp	
tds_mgL_180C		conductivity	
chloride_mgL	92820	conductivity_temp_F	
sodium_mgL		carbonate_mgL	
calcium_mgL		bicarbonate_mgL	122
iron_mgL		sulfate_mgL	133
barium_mgL		hydroxide_mgL	
magnesium_mgL		h2s_mgL	
potassium_mgL		co2_mgL	
strontium_mgL		o2_mgL	
manganese_mgL		anionremarks	

Remarks

(Produced water data courtesy of NMT Octane NM WAIDS database.)

SOS Consulting, LLC

C-108 Item VII.5 - Produced Water Data

Trove Energy & Water, LLC - WLC Mid Federal Project Area

SOURCE ZONE

BONE SPRING

Lab ID

Sample ID 6681

Sample No

API No 3002533529

Well Name THYME APY FEDERAL 002

Location ULSTR 01 23 S 32 E

1650 N 1650 E

Lat / Long 32.33657 -103.62470

County Lea

Operator (when sampled)

Field RED TANK

Unit G

Sample Date 11/27/2001

Analysis Date

Sample Source

Water Typ

Depth (if known)

ph	6.1	alkalinity_as_caco3_mgL	
ph_temp_F		hardness_as_caco3_mgL	
specificgravity	1.15	hardness_mgL	
specificgravity_temp_F		resistivity_ohm_cm	
tds_mgL	172896	resistivity_ohm_cm_temp	
tds_mgL_180C		conductivity	
chloride_mgL	104976	conductivity_temp_F	
sodium_mgL		carbonate_mgL	
calcium_mgL	0	bicarbonate_mgL	781
iron_mgL	0	sulfate_mgL	1150
barium_mgL	0	hydroxide_mgL	
magnesium_mgL	2025	h2s_mgL	0
potassium_mgL		co2_mgL	
strontium_mgL		o2_mgL	
manganese_mgL		anionremarks	

Remarks

(Produced water data courtesy of NMT Octane NM WAIDS database.)

SOS Consulting, LLC

C-108 Item VII.5 - Produced Water Data

Trove Energy & Water, LLC - WLC Mid Federal Project Area

SOURCE ZONE

WOLFCAMP

Lab ID

Sample ID 5096

API No 3002501678

Sample No

Well Name LAGUNA PLATA FEDERAL UNIT 001

Location ULSTR 22 19 S 33 E **Lat / Long** 32.64341 -103.64461

1980 S 710 E **County** Lea

Operator (when sampled)

Field TONTO Unit I

Sample Date Analysis Date

Sample Source DST Depth (if known)

Water Typ

ph		alkalinity_as_caco3_mgL	
ph_temp_F		hardness_as_caco3_mgL	
specificgravity		hardness_mgL	
specificgravity_temp_F		resistivity_ohm_cm	
tds_mgL	46915	resistivity_ohm_cm_temp_	
tds_mgL_180C		conductivity	
chloride_mgL	27270	conductivity_temp_F	
sodium_mgL		carbonate_mgL	
calcium_mgL		bicarbonate_mgL	714
iron_mgL		sulfate_mgL	1116
barium_mgL		hydroxide_mgL	
magnesium_mgL		h2s_mgL	
potassium_mgL		co2_mgL	
strontium_mgL		o2_mgL	
manganese_mgL		anionremarks	

Remarks

(Produced water data courtesy of NMT Octane NM WAIDS database.)

SOS Consulting, LLC

C-108 Item VII.5 - Produced Water Data

Trove Energy Water, LLC - WLC Mid Federal Project Area

DISPOSAL ZONE

DEVONIAN

Lab ID

Sample ID 5720

Sample No

API No 3002521082

Well Name ANTELOPE RIDGE UNIT 003

Location ULSTR 34 23 S 34 E **Lat / Long** 32.25922 -103.46068

1980 S 1650 W **County** Lea

Operator (when sampled)

Field ANTELOPE RIDGE Unit K

Sample Date 11/14/1967 Analysis Date

Sample Source UNKNOWN Depth (if known)

Water Typ

ph	6.9	alkalinity_as_caco3_mgL	
ph_temp_F		hardness_as_caco3_mgL	
specificgravity		hardness_mgL	
specificgravity_temp_F		resistivity_ohm_cm	
tds_mgL	80187	resistivity_ohm_cm_temp_	
tds_mgL_180C		conductivity	
chloride_mgL	47900	conductivity_temp_F	
sodium_mgL		carbonate_mgL	
calcium_mgL		bicarbonate_mgL	476
iron_mgL		sulfate_mgL	900
barium_mgL		hydroxide_mgL	
magnesium_mgL		h2s_mgL	
potassium_mgL		co2_mgL	
strontium_mgL		o2_mgL	
manganese_mgL		anionremarks	

Remarks

(Produced water data courtesy of NMT Octane NM WAIDS database.)

SOS Consulting, LLC

C-108 – Item VIII

Geologic Information

The Devonian and Silurian consist of carbonates including light colored dolomite and chert intervals interspersed with some tight limestone intervals. Several thick sections of porous dolomite capable of taking water are believed present within the subject formations in the area. Depth control data was inferred from deep wells to the south and east. If the base of Devonian and top of Silurian rocks come in as expected the well will only be drilled deep enough for adequate logging rathole.

At a proposed depth of 18,800' BGL (Below Ground Level) the well will TD approximately 1,050' below the estimated top of the Devonian. Mud logging through the interval will ensure the target interval remains in Devonian and Silurian. Once Devonian is determined, the casing shoe depth will be set at an approximate maximum upper depth of 17,550' BGL. Injection will occur through the resulting openhole interval. Should mud or other logs indicate depth adjustment is required to exploit the desired formation as described; sundries with appropriate data will be filed with the OCD.

The Devonian is overlain by the Woodford Shale and Mississippian Lime and underlain by the Middle and Lower Ordovician; Simpson, McKee and Ellenburger.

Fresh water in the area is generally available from the Rustler and Santa Rosa formations. State Engineer's records show water wells in the area with a depth to groundwater of 110 to 220 feet and an average depth of 157 feet.

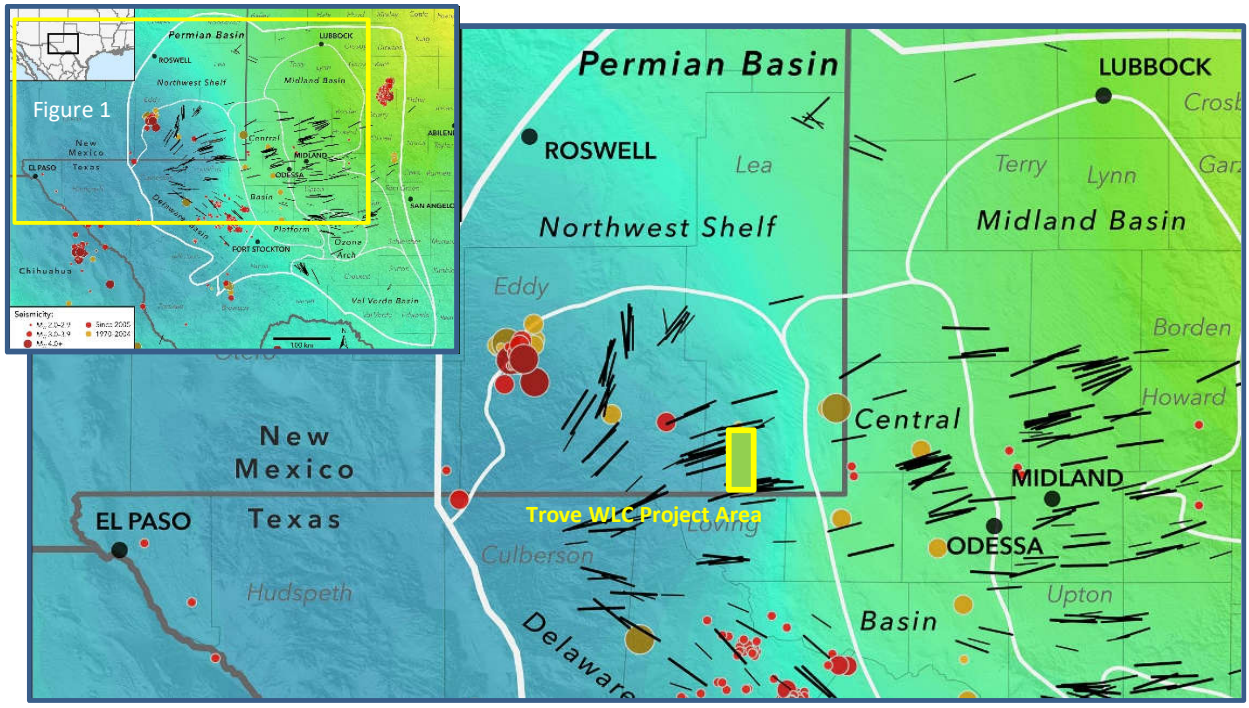
There are NO water wells located within one mile of the proposed SWD however; a representative analysis of area fresh water is included in this application.

C-108 - Item VIII

Geological Data

EARTHQUAKE / SEISMIC INFORMATION SUPPLEMENT

Map Source: State of stress in the Permian Basin, Texas and New Mexico: Implications for induced seismicity (Figure 1); Jens-Erik Lund Snee/ Mark Zoback, February 2018



TROVE PSE PROJECT VICINITY

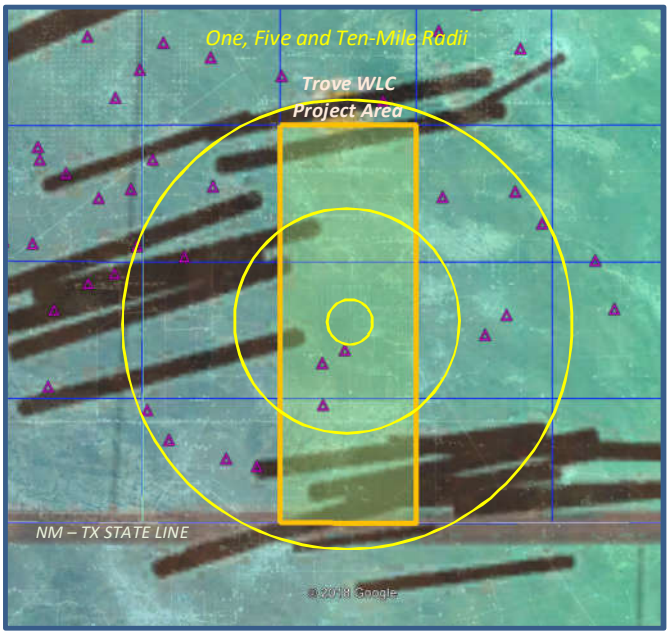


Figure 1. State of stress in the Permian Basin, Texas and New Mexico. Black lines are the measured orientations of the maximum horizontal stress (SHmax), with line length scaled by data quality. The colored background is an interpolation of measured relative principal stress magnitudes (faulting regime) expressed using the Aφ parameter (see text for details) of Simpson (1997). Blue lines are fault traces known to have experienced normal-sense offset within the past 1.6 Ma, from the USGS Quaternary Faults and Folds Database (Crone and Wheeler, 2000). The boundary between the Shawnee and Mazatzal basement domains is from Lund et al. (2015), and the Precambrian Grenville Front is from Thomas (2006). The Permian Basin boundary is from the U.S. Energy Information Administration, and the subbasin boundaries are from the Texas Bureau of Economic Geology Permian Basin Geological Synthesis Project. Earthquakes are from the USGS National Earthquake Information Center, the TexNet Seismic Monitoring Program, and Gan and Frohlich (2013). Focal mechanisms are from Saint Louis University (Herrmann et al., 2011).

C-108 - Item VIII

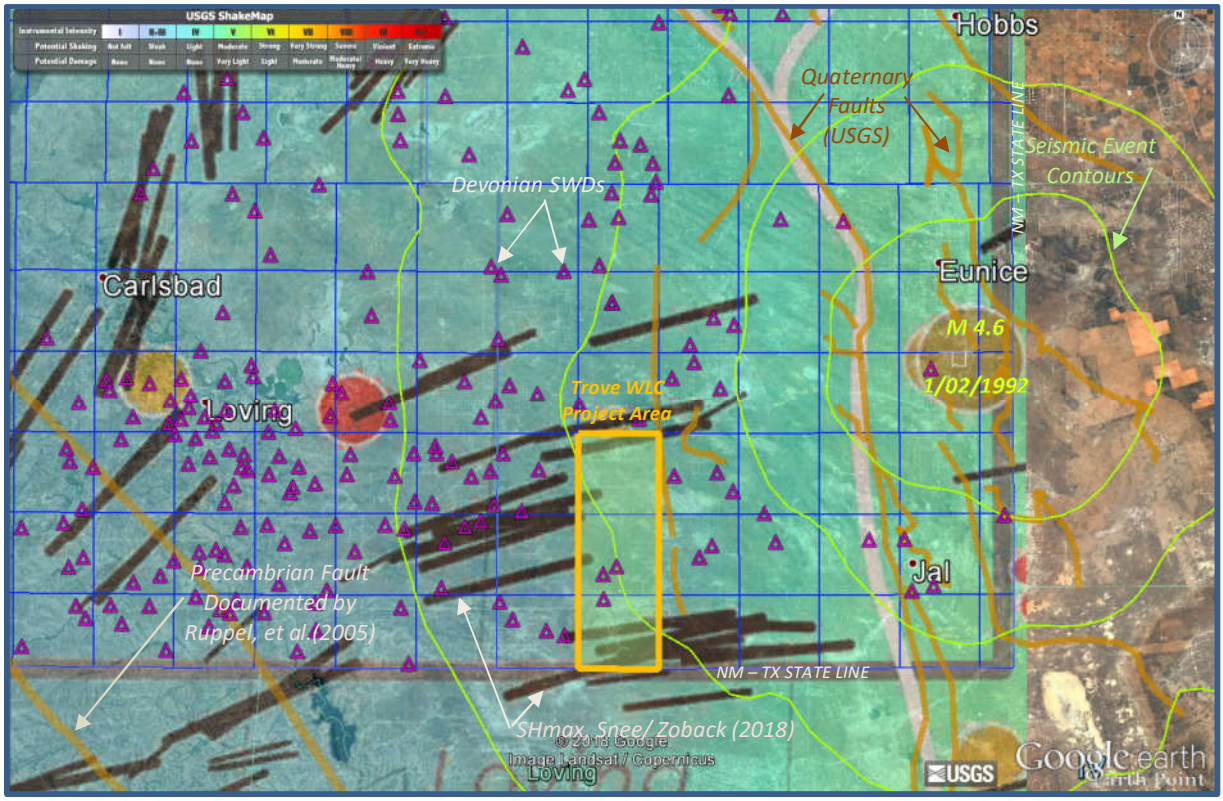
Geological Data

EARTHQUAKE / SEISMIC INFORMATION SUPPLEMENT (cont.)

In the following map, a layer with USGS historical earthquake data is overlaid and, a layer showing lines to represent Precambrian faults as documented by Ruppel, et al. (2005). Finally, a layer showing all currently permitted SWDs completed or proposed to be completed in the Devonian (Silurian) formation.

The USGS earthquakes shown are well known to the area. The 2012 quake located approximately 13 miles due east of Loving is also shown (22.4 miles). This was perhaps the most significant of the area in recent years but was determined to not be related to oil and gas activity. The best known and largest in recent history was the 1992, 4.6 magnitude quake centered south of Eunice, NM (29.5 miles).

The Precambrian faults and existing Devonian SWDs are discussed in more detail on the next page.



REGIONAL VIEW - DEVONIAN SWD LOCATIONS, PRECAMBRIAN FAULTS, $S_{Hmax,}$ USGS MAGNITUDE

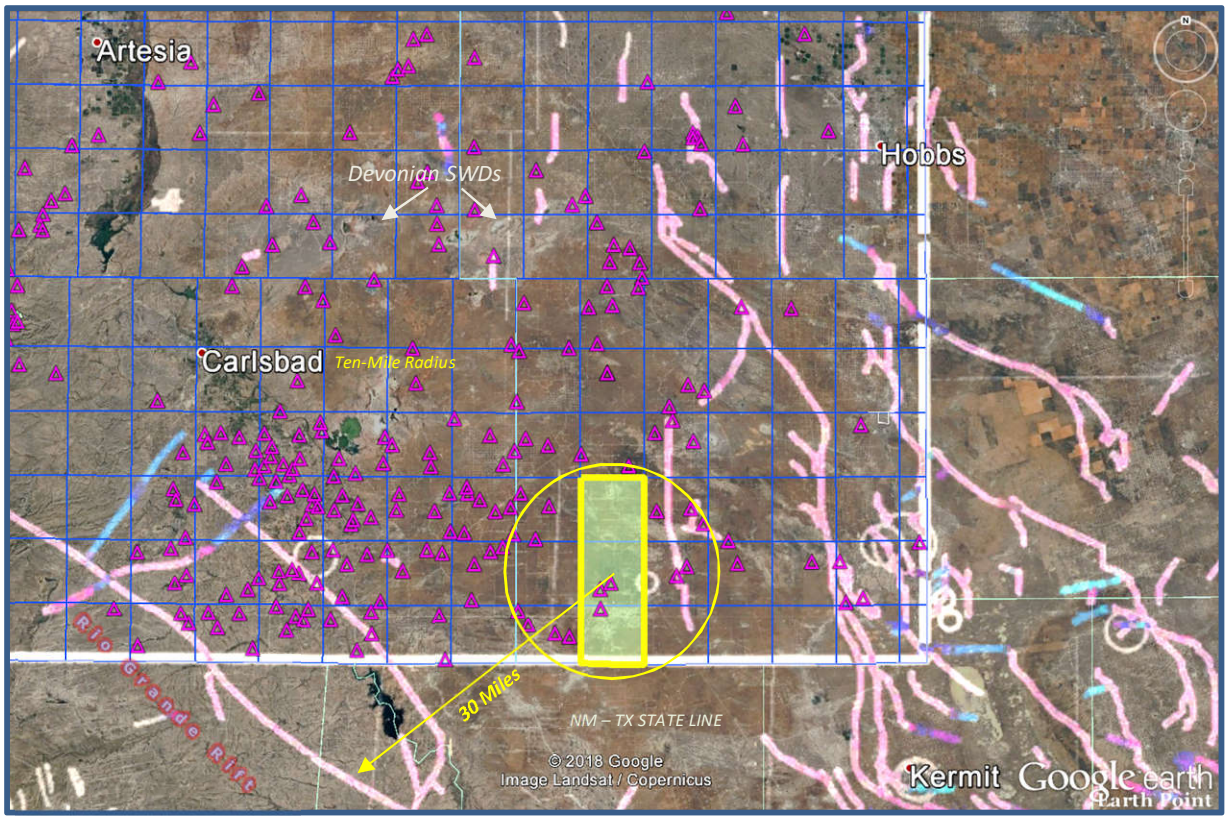
C-108 - Item VIII

Geological Data

EARTHQUAKE / SEISMIC INFORMATION SUPPLEMENT (cont.)

The primary Precambrian faults in the area as documented by Ruppel, et al. (2005) is represented on this map by the thick, pink colored lines. The most significant of these is the fault associated with the Rio Grande Rift, running southeast to northwest and, runs adjacent to a portion of Hwy 285 however; only a small portion the associated fault which runs parallel approximately 15 miles northeast is depicted below. The Trove WLC Project SWD Area is located some 30 miles from the fault. Other documented faults (USGS, 2000) are shown for eastern Lea County and extending into west Texas. Other Devonian SWDs in the area are also shown (small purple triangles) completed or proposed to be completed in the Devonian (Silurian) formation.

The previously referenced study by Snee and Zoback (shown on previous exhibits) evaluated the strike-slip probability using probabilistic FSP (Fault Slip Potential) analysis of known faults in the Permian Basin. The study predicts that the Precambrian fault shown here has less than a 10% probability of being critically stressed to the point of creating an induced seismicity event. The main reason for the low probability is due to the relationship of the strike of the fault to the regional S_{Hmax} orientation; the proposed SWD being well removed from the area.

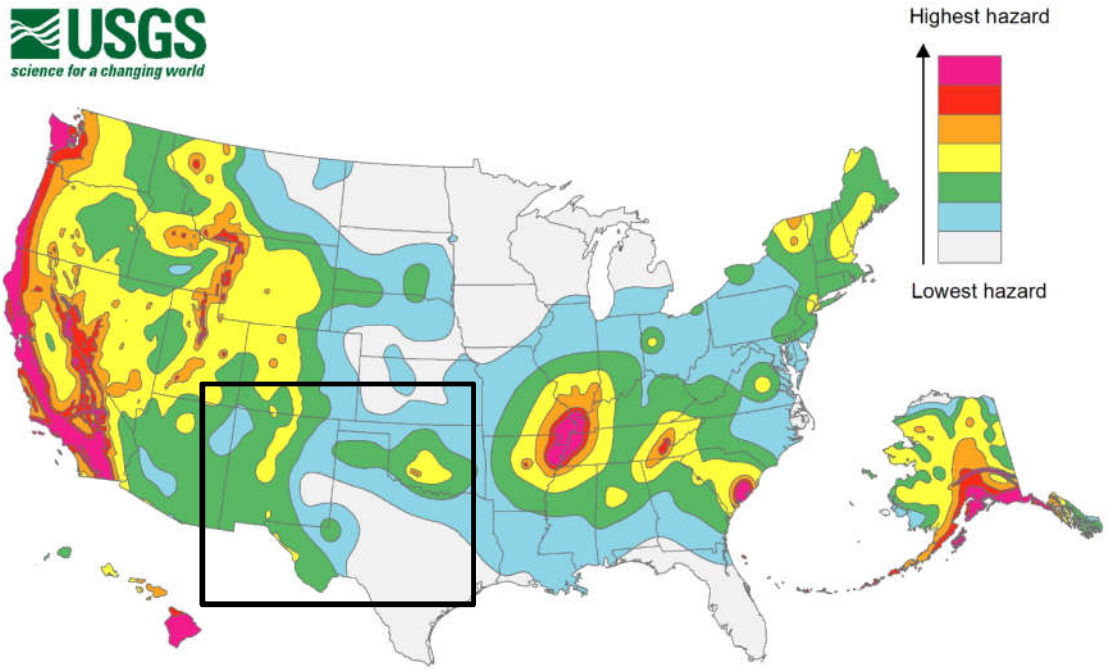


VICINITY - PERMITTED DEVONIAN SWDS, COMPOSITE FAULTS

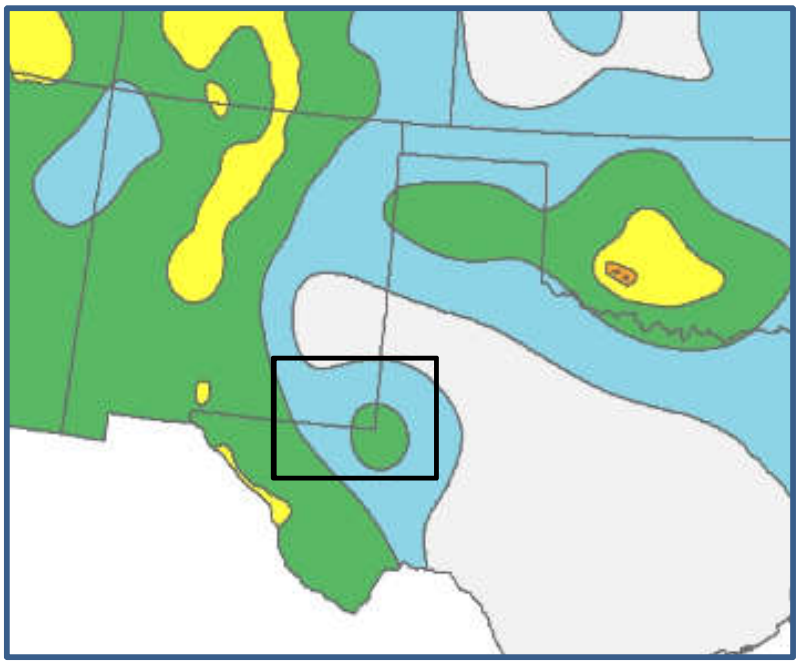
C-108 - Item VIII

Geological Data

EARTHQUAKE / SEISMIC INFORMATION SUPPLEMENT (cont.)



2014 map data: The USGS notes in its report that fracking may be to blame for a sizeable uptick in earthquakes in places like Oklahoma. "Some states have experienced increased seismicity in the past few years that may be associated with human activities such as the disposal of wastewater in deep wells," the report says. USGS hopes to use that data in future maps but it isn't included in this one. "Injection-induced earthquakes are challenging to incorporate into hazard models because they may not behave like natural earthquakes and their rates change based on man-made activities," the report says.

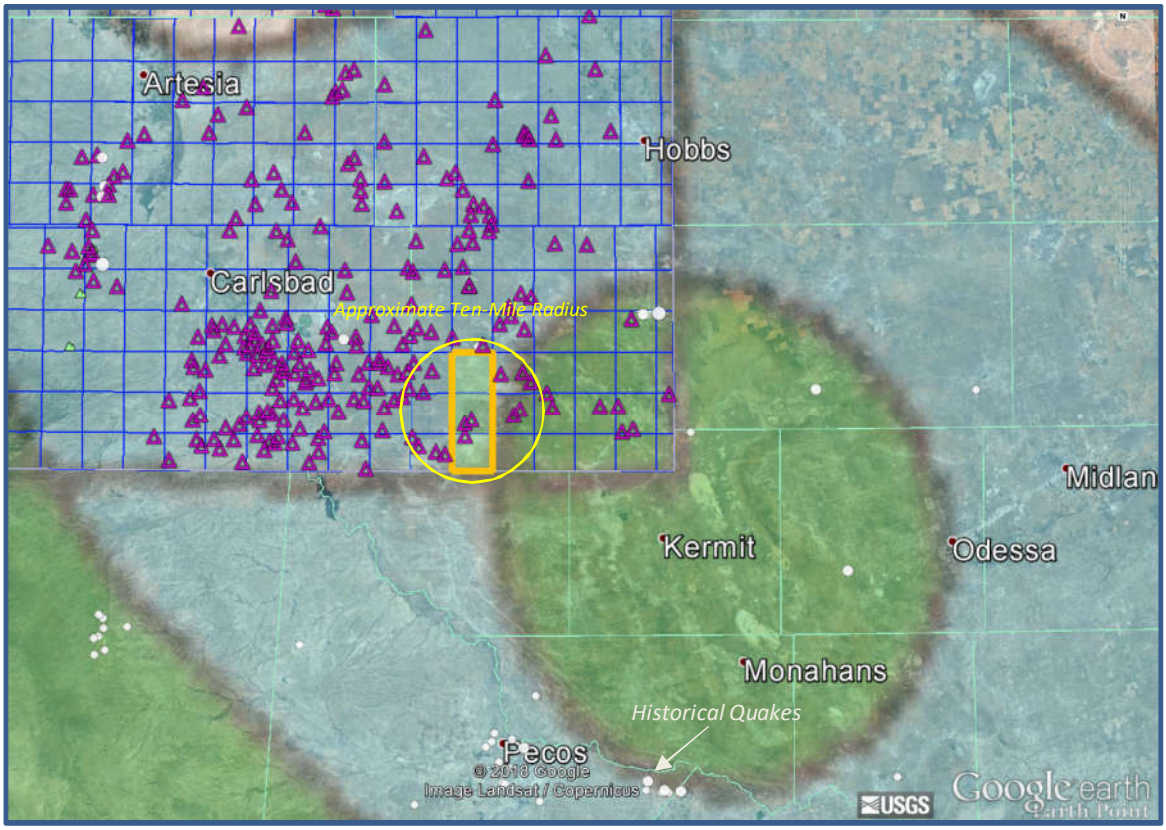


C-108 - Item VIII

Geological Data

EARTHQUAKE / SEISMIC INFORMATION SUPPLEMENT (cont.)

USGS 2014 REGIONAL MAP DATA OVERLAY IN GOOGLE EARTH W/ HISTORICAL EARTHQUAKES



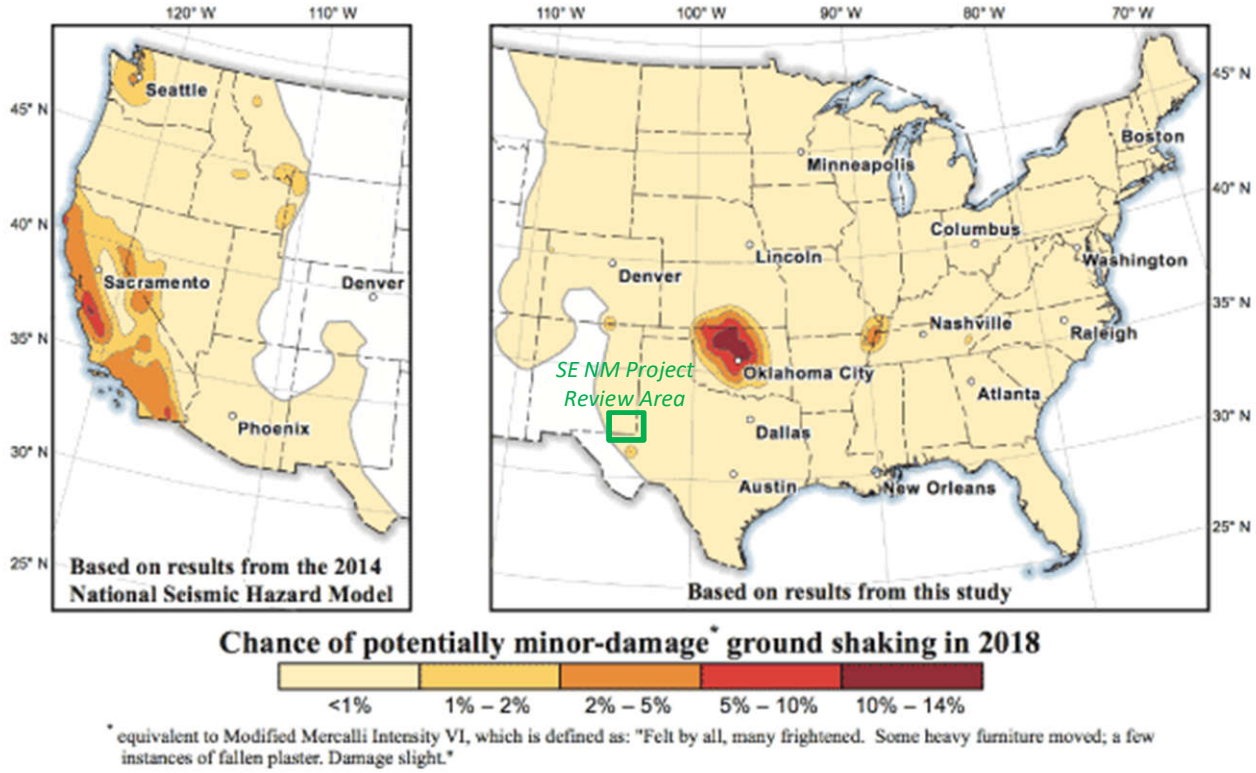
An updated USGS map for 2018 is on the next page. While methodology remained essentially the same according to USGS, the interpreted results and color-coding did have some modification. However, the subject area in southeast New Mexico on both maps remains very low and on the 2018 map, the area is assigned a value of <1% of "potentially minor-damage ground shaking".

C-108 - Item VIII

Geological Data

EARTHQUAKE / SEISMIC INFORMATION SUPPLEMENT (cont.)

USGS 2018 ONE-YEAR MODEL



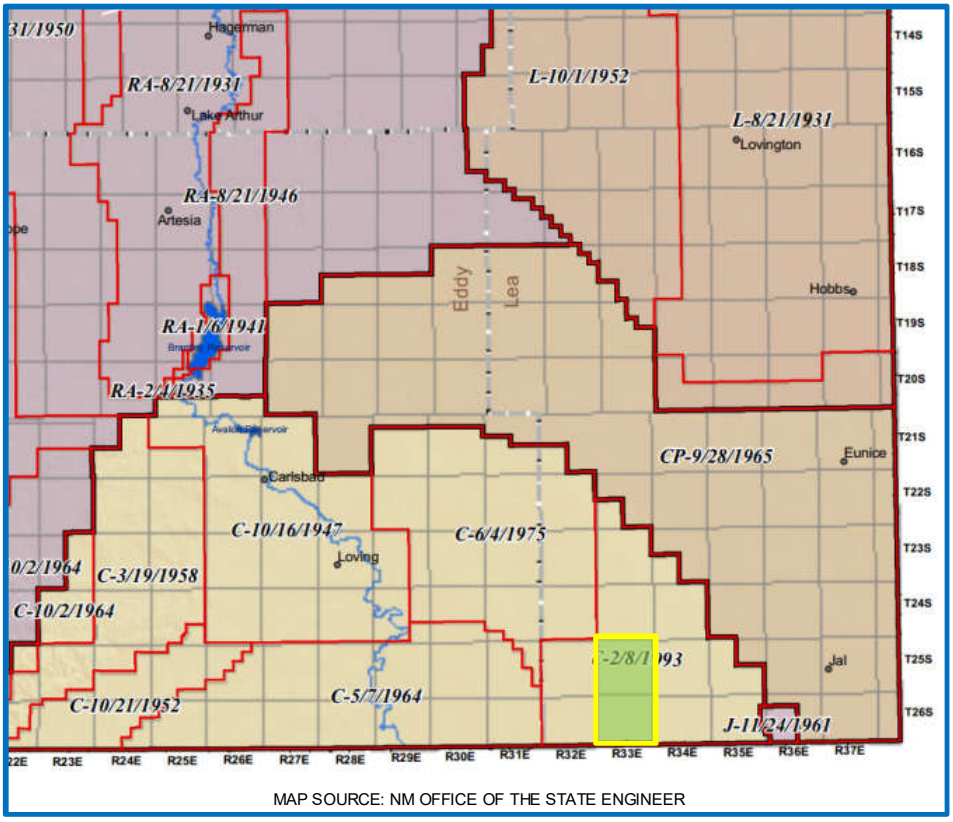
Map showing chance of damage from an earthquake in the Central and Eastern United States during 2018. Percent chances are represented as follows: pale yellow, less than 1 percent; dark yellow, 1 to 2 percent; orange, 2 to 5 percent; red, 5 to 10 percent; dark red, 10 to 12 percent. See Hazard from the western United States from the 2014 National Seismic Hazard Maps (Petersen et al., 2014) for comparison.

The USGS has produced the 2018 one-year probabilistic seismic hazard forecast for the central and eastern United States from induced and natural earthquakes. For consistency, the updated 2018 forecast is developed using the same probabilistic seismicity-based methodology as applied in the two previous forecasts.

Based on publicly available data for the subject area, it is reasonable to believe the risk of induced seismic activity due to disposal injection into this well is extremely low.

C-108 - Item XI

Groundwater Basins - Water Column / Depth to Groundwater



MAP SOURCE: NM OFFICE OF THE STATE ENGINEER

The subject well is located within the Carlsbad Basin.

Fresh water in the area is generally available from the Rustler and Santa Rosa formations. State Engineer's records show water wells in the area with a depth to groundwater of 90 to 185 feet and an average depth of 142 feet.

There are NO water wells located within one mile of the proposed SWD.

SOS Consulting, LLC

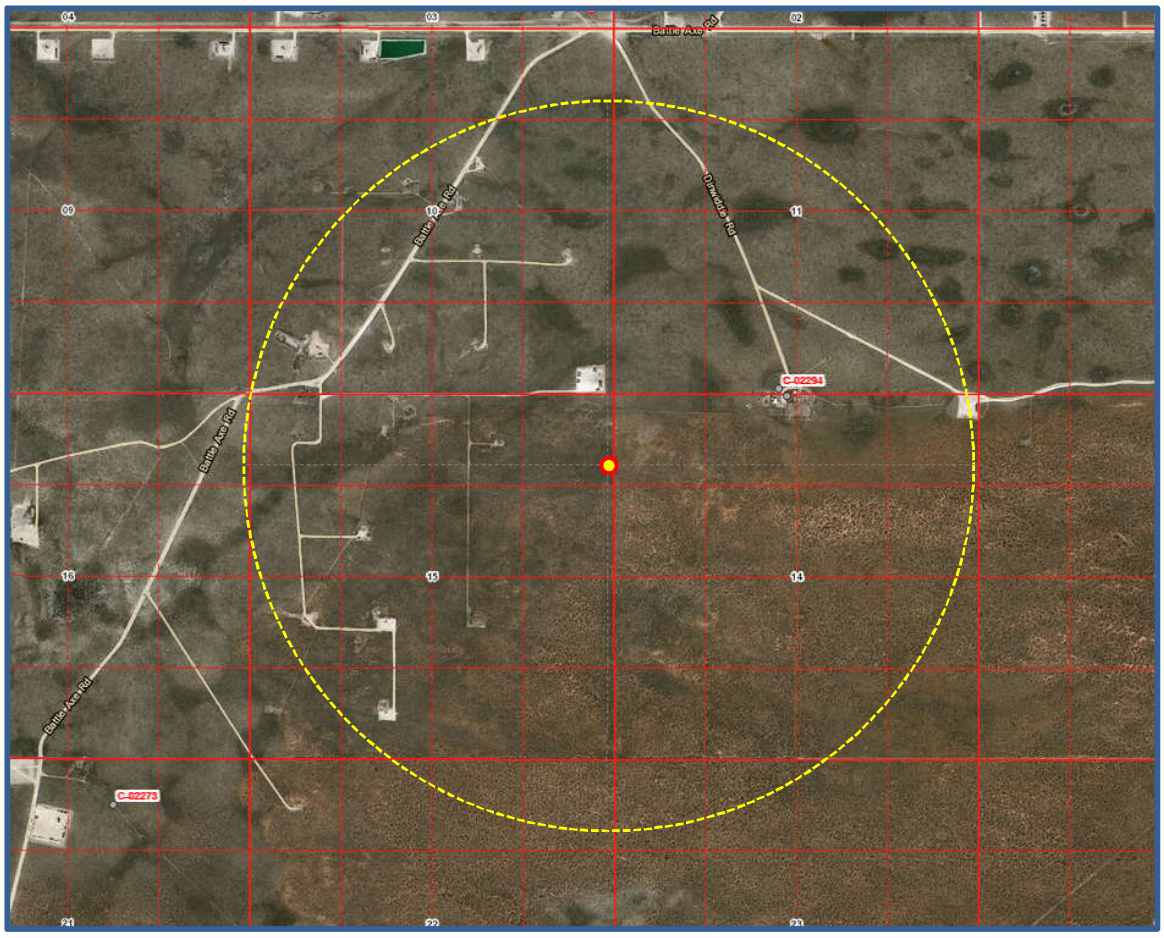
C-108 Item XI

Water Wells Within One Mile

WLC South Federal SWD No.1 - Water Well Locator Map

There is 1 (one) water well (2 PODs) within a one-mile radius of the proposed SWD.

A representative sample is included herein.



Data from NM Office of the State Engineer displayed in OSE-GIS System.

SOS Consulting, LLC

C-108 ITEM XI – WATER WELLS IN AOR

Depth to Ground Water

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Sub-basin Code	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
C 02270	CUB	LE	1	1	2	27	26S	33E	636063	3543722	150	125	25
C 02273	CUB	LE		1	2	21	26S	33E	634549	3545134*	160	120	40
C 02285 POD1	CUB	LE	1	4	4	03	26S	33E	636613	3548855	220	220	0
C 02286	CUB	LE	3	4	4	03	26S	33E	636470	3548714	220	175	45
C 02287	C	LE	3	4	4	03	26S	33E	636427	3548708	220		
C 02288	CUB	LE	4	4	4	03	26S	33E	636646	3548758	220	180	40
C 02289	CUB	LE	4	4	4	03	26S	33E	636612	3548675*	200	160	40
C 02290	CUB	LE	4	4	4	03	26S	33E	636538	3548770	200	160	40
C 02293	CUB	LE	2	2	1	14	26S	33E	637501	3546975	200	135	65
C 02294	CUB	LE	4	4	3	11	26S	33E	637465	3547003	200	145	55
C 02295	CUB	LE	2	2	4	12	26S	33E	639850	3547710*	250	200	50
C 03577 POD1	CUB	LE	3	3	3	22	26S	33E	636010	3543771	750	110	640
C 03596 POD1	C	LE	3	3	4	22	26S	33E	636017	3543756	225		

Average Depth to Water: **157 feet**

Minimum Depth: **110 feet**

Maximum Depth: **220 feet**

Record Count: 13

PLSS Search:

Township: 26S **Range:** 33E

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

C-108 ITEM XII

Geologic Affirmation

We have examined available geologic and engineering data and have found no evidence of open faults or other hydrologic connection between the disposal interval and any underground sources of drinking water.

Ben Stone, Partner
SOS Consulting, LLC

Project: Trove Energy and Water, LLC
WLC South Project Area
Reviewed 2/22/2019

C-108 ITEM XIII – PROOF OF NOTIFICATION

IDENTIFICATION AND NOTIFICATION OF INTERESTED PARTIES

Exhibits for Section

Affected Parties Map

List of Interested Parties

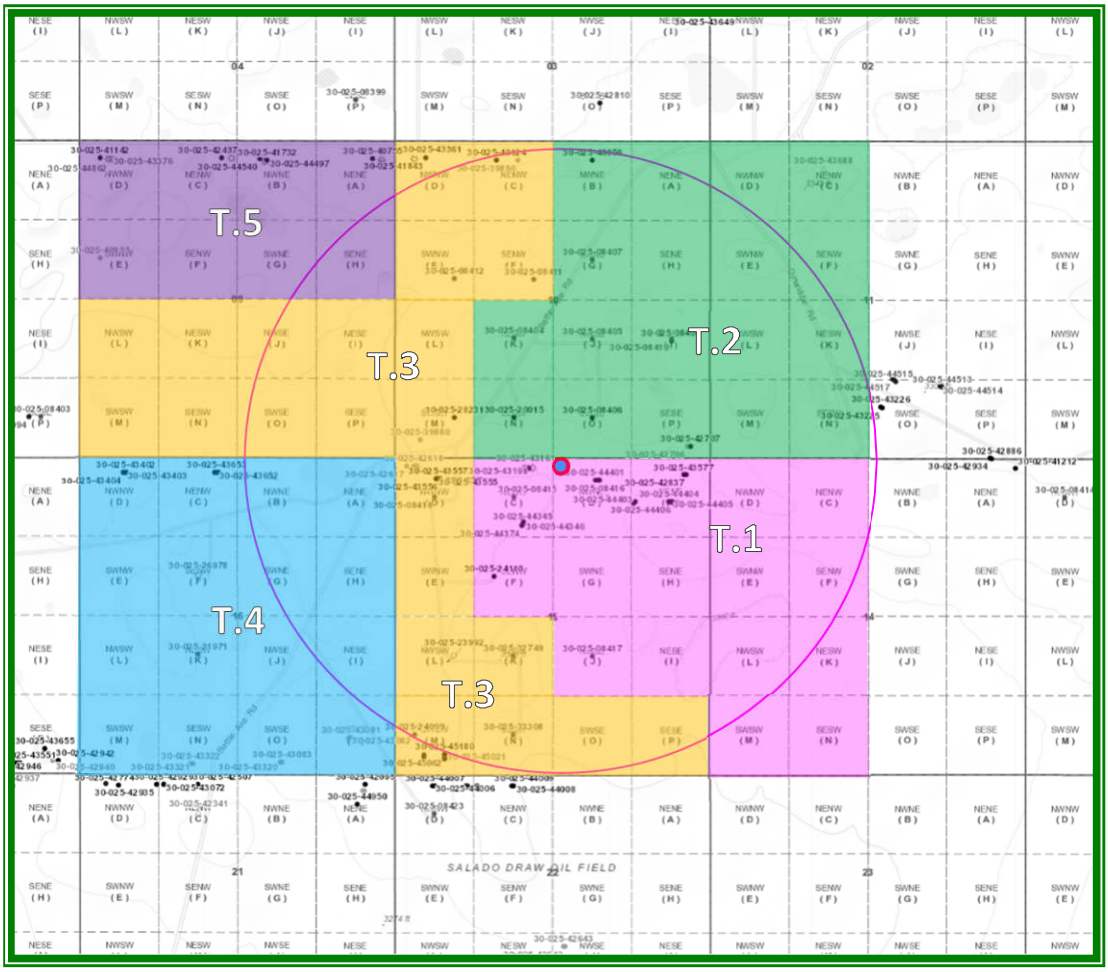
Notification Letter to Interested Parties

Proof of Certified Mailing

Published Legal Notice

WLC South Federal SWD Well No.1 – Affected Parties Plat

(Attachment to NMOCD Form C-108, Application for Authority to Inject.)



TROVE
ENERGY and WATER

LEGEND

T.1 – NMNM-0002965A – ConocoPhillips Company

T.2 – NMNM-359292 – ConocoPhillips Company

T.3 – NMNM-015321 – Battle Axe Ranch, LLC

T.4 – L0-4785-0002 – Broughton Petro., Inc.

T.5 – NMNM-0000127A – ConocoPhillips Co.

SOS Consulting, LLC

C-108 ITEM XIII – PROOF OF NOTIFICATION
AFFECTED PARTIES LIST

SOS Consulting is providing electronic delivery of C-108 applications.
ALL APPLICABLE AFFECTED PARTIES ARE PROVIDED A LINK IN THE NOTICE LETTER TO A SECURE SOS/ CITRIX SHAREFILE® SITE TO VIEW AND DOWNLOAD A FULL COPY OF THE SUBJECT C-108 APPLICATION IN PDF FORMAT.

"AFFECTED PERSON" MEANS THE DIVISION DESIGNATED OPERATOR; IN THE ABSENCE OF AN OPERATOR, A LESSEE WHOSE INTEREST IS EVIDENCE BY A WRITTEN CONVEYANCE DOCUMENT EITHER OF RECORD OR KNOWN TO THE APPLICANT AS OF THE DATE THE APPLICANT FILES THE APPLICATION; OR IN THE ABSENCE OF AN OPERATOR OR LESSEE, A MINERAL INTEREST OWNER WHOSE INTEREST IS EVIDENCED BY A WRITTEN CONVEYANCE DOCUMENT EITHER OF RECORD OR KNOWN TO THE APPLICANT AS OF THE DATE THE APPLICANT FILED THE APPLICATION FOR PERMIT TO INJECT.; PER OCD RULES NMAC 19.15.26.7, A. AND 19.15.26.8, B.2.

SURFACE OWNER

1 U.S. DEPARTMENT OF INTERIOR
Bureau of Land Management
Oil & Gas Division
620 E. Greene St.
Carlsbad, NM 88220
Certified: 7018 0360 0001 8569 7412

OFFSET MINERALS LESSEES and OPERATORS (All Notified via USPS Certified Mail)

BLM Leases NMNM-0002965A, 359292, 0000127A (T.1, T.2 and T.5 on Map)
Lessee
CONOCOPHILLIPS COMPANY
P.O. Box 2197
Houston, TX 77252-2197

Operators
2 EOG RESOURCES, INC.
105 S. 4th St.
Artesia, NM 88210
Certified: 7018 0360 0001 8569 7429

3 MEWBOURNE OIL COMPANY
Attn: Tim Harrington
P.O. Box 7698
Tyler, TX 75711
Certified: 7018 0360 0001 8569 7436

Private Lease – Battle Axe Ranch, LLC (T.3 on Map)
Lessee & Operator
EOG RESOURCES, INC.
105 S. 4th St.
Artesia, NM 88210

State Lease L0-4785-0002 (T.4 on Map)
Lessee
BROUGHTON PETROLEUM, INC
205 Silliman Street
Sealy, TX 77474

C-108 ITEM XIII – PROOF OF NOTIFICATION
AFFECTED PARTIES LIST (cont.)

State Lease L0-4785-0002 (T.4 on Map) cont.
Operator
MEWBOURNE OIL COMPANY
Attn: Tim Harrington
P.O. Box 7698
Tyler, TX 75711

OFFSET MINERALS OWNERS (Notified via USPS Certified Mail)

U.S. DEPARTMENT OF INTERIOR
Bureau of Land Management
Oil & Gas Division
620 E. Greene St.
Carlsbad, NM 88220

4 STATE OF NEW MEXICO
Oil, Gas and Minerals Division
310 Old Santa Fe Trail
Santa Fe, NM 87504
Certified: 7018 0360 0001 8569 7443

REGULATORY

NEW MEXICO OIL CONSERVATION DIVISION (FedEx'ed original and copy)
1220 S. St. Francis Dr.
Santa Fe, NM 87505

NEW MEXICO OIL CONSERVATION DIVISION (FedEx'ed copy)
1625 N. French Drive
Hobbs, NM 88240

April 25, 2019

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

To Whom It May Concern:

Trove Energy and Water, LLC, Hobbs, New Mexico, is preparing applications to the New Mexico Oil Conservation Division to drill and complete for salt water disposal the WLC South Federal SWD Well No.1. The proposed commercial operation will be for produced water disposal from area operators. As indicated in the notice below, the well will be located in Section 15, Township 26 South, Range 33 East in Lea County, New Mexico.

The published notice states that the interval will be from 17,550 feet to 18,800 feet into the Devonian, Silurian and Fusselman formations.

Following is the notice published in the Hobbs News-Sun, Hobbs, New Mexico on or about April 7, 2018.

LEGAL NOTICE

Trove Energy and Water, LLC, 1919 North Turner, Hobbs, NM 88240, is filing Form C-108 (Application for Authority to Inject) with the New Mexico Oil Conservation Division seeking administrative approval for a salt water disposal well. The proposed well, the WLC South Federal SWD Well No.1 will be located 900' FNL and 100' FEL, Section 15, Township 26 South, Range 33 East, Lea County, New Mexico; approximately 21.7 miles west/ southwest of Jal, NM.

Produced water from area production will be commercially disposed into the Devonian, Silurian and Fusselman formations at a maximum interval depth of 17,550' to 18,800' at a maximum surface pressure of 3510 psi and a rate limited only by such pressure. Mudlogging and e-logs will confirm final interval depths.

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, SOS Consulting, LLC, (903)488-9850 or, email info@sosconsulting.us.

You have been identified as a party who may be interested as an offset lessee or operator.

You are entitled to a full copy of the application. A full copy in PDF format will be posted on the SOS Consulting ***ShareFile*** site and available for future download (posting may lag behind the notice effort).

Use the URL link: https://sosconsulting.sharefile.com/d-sab265fc01ab4d259
(Please Note: The ShareFile service is powered by Citrix Systems and is completely secure.*)

The link to this file will be active for 60 days from the date of this letter. Your company can access and download the file a maximum of five (5) times. (One copy may be downloaded and shared as needed among your company.)

If preferred, you may call SOS Consulting, LLC at 903-488-9850, or email info@sosconsulting.us, and the same PDF file copy will be expedited to you via email.

Please use a subject like "**WLC South Fed SWD #1 April 2019 PDF Copy Request**".

Thank you for your attention in this matter.

Best regards,

Ben Stone, SOS Consulting, LLC
Agent for Trove Energy and Water, LLC

Cc: Application File

SOS Consulting is committed to providing superior quality work using technology to assist clients and affected parties in obtaining the documentation required. SOS will continue to utilize methods which are less energy and resource intensive including, the reduction of paper copies.

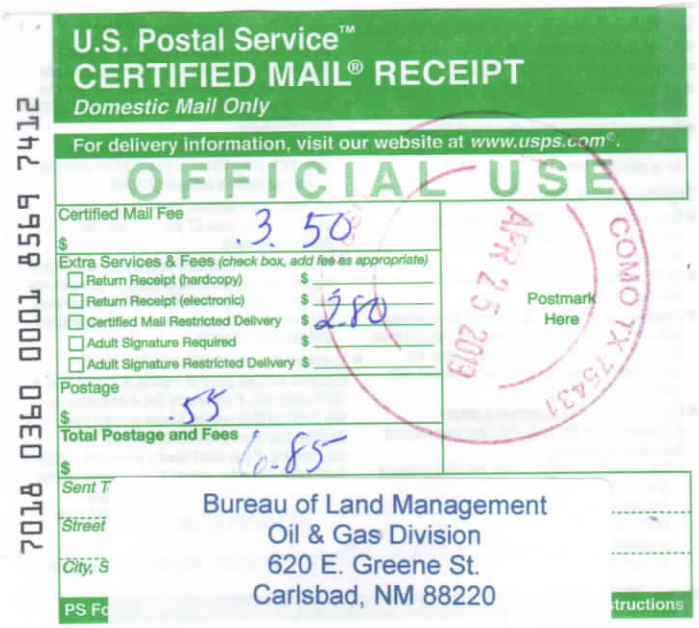
We hope you'll partner with us and appreciate these efforts.

***** You will be asked for your email, name and company.
This will not be used by anyone except keeping track of the file downloads.
You will not be solicited by SOS or anyone else. Data is stored on Citrix Systems servers only.

CITRIX
ShareFile

C-108 - Item XIV

Proof of Notice (Certified Mail Receipts)



U.S. Postal Service™
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) $
- Return Receipt (electronic) $
- Certified Mail Restricted Delivery $ 2.80
- Adult Signature Required $
- Adult Signature Restricted Delivery $

Postage $ .55
Total Postage and Fees $ 6.85

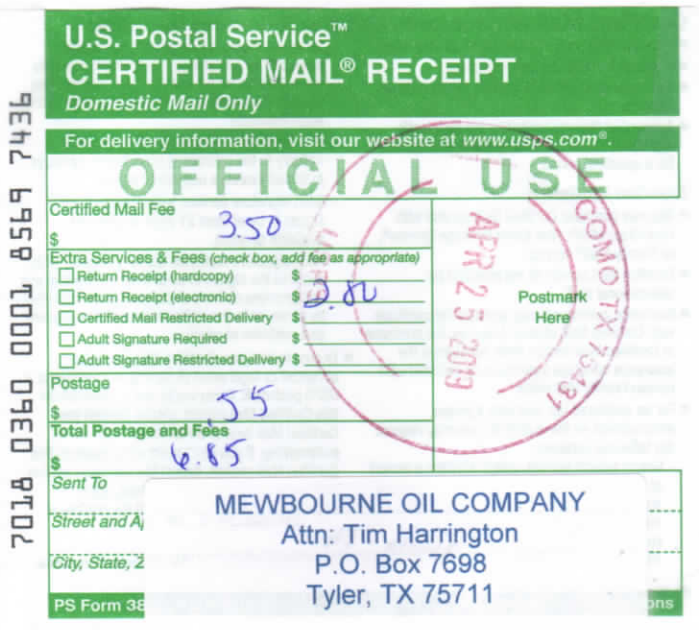
Postmark Here
APR 25 2019 COMO TX 75431

Sent To
Street
City, S

Bureau of Land Management
Oil & Gas Division
620 E. Greene St.
Carlsbad, NM 88220

PS Fo ... tructions

7018 0360 0001 8569 7412



U.S. Postal Service™
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) $
- Return Receipt (electronic) $ 2.80
- Certified Mail Restricted Delivery $
- Adult Signature Required $
- Adult Signature Restricted Delivery $

Postage $ .55
Total Postage and Fees $ 6.85

Postmark Here
APR 25 2019 COMO TX 75431

Sent To
Street and A
City, State, Z

MEWBOURNE OIL COMPANY
Attn: Tim Harrington
P.O. Box 7698
Tyler, TX 75711

PS Form 38 ... ons

7018 0360 0001 8569 7436

U.S. Postal Service™
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) $
- Return Receipt (electronic) $
- Certified Mail Restricted Delivery $ 2.80
- Adult Signature Required $
- Adult Signature Restricted Delivery $

Postage $ .55
Total Postage and Fees $ 6.85

Postmark Here
APR 25 2019 COMO TX 75431

Sent To
Street
City, S

EOG RESOURCES, INC.
Attn: Chuck Moran
5509 Champions Drive
Midland, TX 79706

PS Fo ... tructions

7018 0360 0001 8569 7429

U.S. Postal Service™
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) $
- Return Receipt (electronic) $ 2.80
- Certified Mail Restricted Delivery $
- Adult Signature Required $
- Adult Signature Restricted Delivery $

Postage $ .55
Total Postage and Fees $ 6.85

Postmark Here
APR 25 2019 COMO TX 75431

Sent To
Street and
City, State

STATE OF NEW MEXICO
Oil, Gas and Minerals Division
310 Old Santa Fe Trail
Santa Fe, NM 87504

PS Form ... ctions

7018 0360 0001 8569 7443

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
April 07, 2019
and ending with the issue dated
April 07, 2019.

Publisher

Sworn and subscribed to before me this
7th day of April 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

LEGALS

LEGAL NOTICE
APRIL 7, 2019

Trove Energy and Water, LLC, 1919 North Turner, Hobbs, NM 88240, is filing Form C-108 (Application for Authority to Inject) with the New Mexico Oil Conservation Division seeking administrative approval for a salt water disposal well. The proposed well, the WLC South Federal SWD Well No.1 will be located 900' FNL and 100' FEL, Section 15, Township 26 South, Range 33 East, Lea County, New Mexico; approximately 21.7 miles west/ southwest of Jal, NM.

Produced water from area production will be commercially disposed into the Devonian, Silurian and Fusselman formations at a maximum interval depth of 17,550' to 18,800' at a maximum surface pressure of 3510 psi and a rate limited only by such pressure. Mudlogging and e-logs will confirm final interval depths.

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, SOS Consulting, LLC, (903)488-9850 or, email info@sosconsulting.us.
#33996

67104420 00226836

BEN STONE
SOS CONSULTING, LLC.
P.O. BOX 300
COMO, TX 75431