



September 21, 2018

Florene Davidson
NM Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, NM 87505

Jennifer L. Bradfute
505.848.1845
Fax: 505.848.1882
jlb@modrall.com

**Re: APPLICATION OF NGL WATER SOLUTIONS
PERMIAN, LLC TO APPROVE SALT WATER
DISPOSAL WELLS IN LEA AND EDDY COUNTY, NEW
MEXICO.**

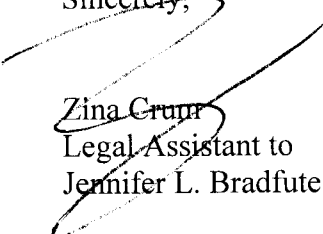
Dear Ms. Davidson:

Enclosed please find three copies of the following:

1. NGL Water Solutions Permian, LLC's Amended Application – Jack Tank No. 16438.

Thank you for your assistance. Please contact me if you have any questions.

Sincerely,


Zina Crump
Legal Assistant to
Jennifer L. Bradfute

JLB/zc
Enclosure

Modrall Sperling
Roehl Harris & Sisk
P.A.

Bank of America
Centre
500 Fourth Street
NW
Suite 1000
Albuquerque,
New Mexico 87102

PO Box 2168
Albuquerque,
New Mexico
87103-2168

Tel: 505.848.1800



MODRALL SPERLING

L A W Y E R S

September 18, 2018

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

**Re: AMENDED APPLICATION OF NGL WATER SOLUTIONS
PERMIAN, LLC FOR APPROVAL OF SALT WATER
DISPOSAL WELL IN LEA COUNTY, NEW MEXICO**

CASE NO. 16438

TO: AFFECTED PERSONS

This letter is to advise you that NGL Water Solutions Permian, LLC ("NGL") has filed the enclosed application, which seeks an order approving disposal into the Devonian formation through the **Jack Tank SWD #1** well. NGL proposes to drill this well at a surface location 1,400 feet from the North line and 1,853 feet from West line of Section 5, Township 24 South, Range 32 East, NMPM, Lea County, New Mexico. The target injection interval is the Devonian formation at a depth of 16,800' – 17,809'. NGL further seeks approval of the use of 7 inch tubing inside the surface and intermediate casings and 5 ½ inch tubing inside the liner and requests that the Division approve a maximum daily injection rate for the well of 50,000 bbls per day. Attached to the application is an updated C-108 for the proposed well.

This case is currently set for a hearing before a Division Examiner on October 4, 2018, starting at 8:15 a.m. The hearing will be held in Porter Hall in the Oil Conservation Division's Santa Fe Office located at 1220 South Saint Francis Drive, Santa Fe, New Mexico 87505. As a pooled party who may be affected by this application, we are notifying you of your right to appear at the hearing and participate in the case, including the right to present evidence either in support of or in opposition to the application. Failure to appear at the hearing may preclude you from any involvement in the case at a later date.

You are further notified that if you desire to appear in this case, then you are requested to file a Pre-Hearing Statement with the Division at least four business days in advance of a scheduled hearing before the Division or the Commission, but in no event later than 5:00 p.m. mountain time, on the Thursday preceding the scheduled hearing date, with a copy delivered to the undersigned.

Deana M. Bennett
Deana.bennett@modrall.cc
505-848-1834

Modrall Sperling
Roehl Harris & Sisk P.A.

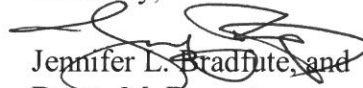
500 Fourth Street NW
Suite 1000
Albuquerque,
New Mexico 87102

PO Box 2168
Albuquerque,
New Mexico 87103-2168

Tel: 505.848.1800
www.modrall.com

Page 2

Sincerely,



Jennifer L. Bradfute, and
Deana M. Bennett
Attorneys for Applicant

**STATE OF NEW MEXICO
DEPARTMENT OF ENERGY, MINERALS AND NATURAL RESOURCES
OIL CONSERVATION DIVISION**

**AMENDED APPLICATION OF NGL WATER
SOLUTIONS PERMIAN, LLC
TO APPROVE SALT WATER
DISPOSAL WELL IN LEA
COUNTY, NEW MEXICO.**

CASE NO. 16438

AMENDED APPLICATION

NGL Water Solutions Permian, LLC ("NGL"), OGRID No. 372338, through its undersigned attorneys, hereby makes this application to the Oil Conservation Division pursuant to the provisions of N.M. Stat. Ann. § 70-2-12, for an order approving drilling of a salt water disposal well in Lea County, New Mexico. In support of this application, NGL states as follows:

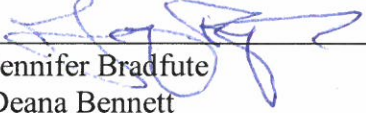
- (1) NGL proposes to drill the Jack Tank SWD #1 well at a surface location 1,400 feet from the North line and 1,853 feet from West line of Section 5, Township 24 South, Range 32 East, NMPM, Lea County, New Mexico for the purpose of operating a salt water disposal well.
- (2) NGL seeks authority to inject salt water into the Devonian formation at a depth of 16,800' – 17,809'.
- (3) NGL further seeks approval of the use of 7 inch tubing inside the surface and intermediate casings and 5 ½ inch tubing inside the liner and requests that the Division approve a maximum daily injection rate for the well of 50,000 bbls per day.
- (4) NGL anticipates using an average pressure of 2,520 psi for this well, and it requests that a maximum pressure of 3,360 psi be approved for the well.
- (5) A C-108 for the subject well is attached hereto in Attachments A.

(6) The granting of this application will avoid the drilling of unnecessary wells, will prevent waste, and will protect correlative rights.

WHEREFORE, NGL requests that this application be set for hearing before an Examiner of the Oil Conservation Division on October 4, 2018; and that after notice and hearing, the Division enter its order approving this application.

Respectfully submitted,

MODRALL, SPERLING, ROEHL, HARRIS
& SISK, P.A.

By: 
Jennifer Bradfute
Deana Bennett
Post Office Box 2168
Bank of America Centre
500 Fourth Street NW, Suite 1000
Albuquerque, New Mexico 87103-2168
Telephone: 505.848.1800
Attorneys for Applicant

CASE NO. 16438: Amended Application of NGL Water Solutions Permian, LLC for approval of salt water disposal well in Lea County, New Mexico. Applicant seeks an order approving disposal into the Devonian formation through the Jack Tank SWD #1 well. NGL proposes to drill this well at a surface location 1,400 feet from the North line and 1,853 feet from West line of Section 5, Township 24 South, Range 32 East, NMPM, Lea County, New Mexico. The target injection interval is the Devonian formation at a depth of 16,800' – 17,809'. NGL further seeks approval of the use of 7 inch tubing inside the surface and intermediate casings and 5 ½ inch tubing inside the liner and requests that the Division approve a maximum daily injection rate for the well of 50,000 bbls per day. Said area is located approximately 22 miles west of Jal, New Mexico.

RECEIVED:	REVIEWER:	TYPE:	APP NO:
-----------	-----------	-------	---------

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: NGL WATER SOLUTIONS PERMIAN LLC**OGRID Number:** 372338**Well Name:** JACK TANK SWD #1**API:** TBD**Pool:** SWD; SILURIAN-DEVONIAN**Pool Code:** 96101

**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**2) NOTIFICATION REQUIRED TO:** Check those which apply.A. ☒ Offset operators or lease holdersB. ☐ Royalty, overriding royalty owners, revenue ownersC. ☒ Application requires published noticeD. ☒ Notification and/or concurrent approval by SLOE. ☒ Notification and/or concurrent approval by BLMF. ☒ Surface ownerG. ☐ For all of the above, proof of notification or publication is attached, and/or,H. ☐ No notice required**FOR OCD ONLY**☐

Notice Complete

☐Application
Content
Complete

- 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.

CHRIS WEYAND

Print or Type Name

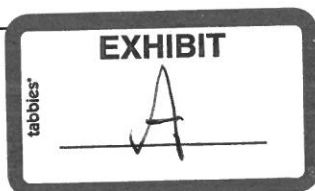
09/12/2018

Date

512-600-1764

Phone Number

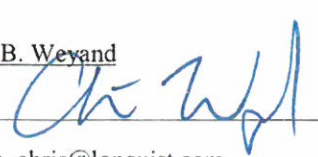
Signature



CHRIS@LONQUIST.COM

e-mail Address

APPLICATION FOR AUTHORIZATION TO INJECT

- I. PURPOSE: _____ Secondary Recovery _____ Pressure Maintenance X Disposal _____ Storage
Application qualifies for administrative approval? X Yes _____ No
- II. OPERATOR: NGL WATER SOLUTIONS PERMIAN, LLC
ADDRESS: 1509 W WALL ST // STE 306 // MIDLAND, TX 79701
CONTACT PARTY: SARAH JORDAN PHONE: (432) 685-0005 x1989
- 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: _____
- 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: Christopher B. Weyand TITLE: Consulting Engineer
SIGNATURE:  DATE: 8/21/2018
E-MAIL ADDRESS: chris@lonquist.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: _____

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.

NGL Water Solutions Permian, LLC

Jack Tank SWD No. 1

FORM C-108 Supplemental Information

III. Well Data

A. Wellbore Information

1.

Well information	
Lease Name	Jack Tank SWD
Well No.	1
Location	S-05 T-24S R-32E
Footage Location	1,400' FNL & 1,853 FWL

2.

a. Wellbore Description

Casing Information				
Type	Surface	Intermediate	Production	Liner
OD	20"	13.375"	9.625"	7.625"
WT	0.438"	0.480"	0.545"	0.500"
ID	19.124"	12.415"	8.535"	6.625"
Drift ID	18.937"	12.259"	8.535"	6.500"
COD	21.00"	14.375"	10.625"	7.625"
Weight	94 lb/ft	68 lb/ft	53.5 lb/ft	39 lb/ft
Grade	J-55	L-80	HCL-80	Q-125
Hole Size	24"	17.5"	12.25"	8.5"
Depth Set	1,250'	4,770'	12,200'	16,800'

b. Cementing Program

Cement Information				
Casing String	Surface	Intermediate	Production	Liner
Lead Cement	C	C	H,H,C	H
Lead Cement Volume	685	1,658	Stage 1: 664 sks Stage 2: 621 sks Stage 3: 773 sks	95
Tail Cement	C	C	H,H,C	H
Tail Cement Volume	931	1,055	Stage 1: 393 sks Stage 2: 472 sks Stage 3: 295 sks	H
Cement Excess	25%	10%	10%	10%
TOC	Surface	Surface	Surface	11,700'
Method	Circulate to Surface	Circulate to Surface	Circulate to Surface	Logged

3. Tubing Description

Tubing Information		
OD	7"	5.5"
WT	0.362"	0.304"
ID	6.276"	4.892"
Drift ID	7.875"	6.050"
COD	6.151"	4.653"
Weight	26 lb/ft	17 lb/ft
Grade	P-110 TCPC	P-110 TCPC
Depth Set	0'-11,600'	11,600-16,750

Tubing will be lined with Duoline.

4. Packer Description

7-5/8" x 5-1/2" TCPC Permanent Packer with High Temp Elastomer and Full Inconel

B. Completion Information

1. Injection Formation: Devonian, Silurian, Fusselman, Montoya (Top 100')
2. Gross Injection Interval: 16,800' – 17,809'

Completion Type: Open Hole

3. Drilled for injection.
4. See the attached wellbore schematic.
5. Oil and Gas Bearing Zones within area of well:

Formation	Depth
Delaware	4,759'
Bone Spring	8,559'
Wolfcamp	11,969'

VI. Area of Review

No wells within the area of review penetrate the proposed injection zone.

VII. Proposed Operation Data

1. Proposed Daily Rate of Fluids to be Injection:

Average Volume: 40,000 BPD

Maximum Volume: 50,000 BPD

2. Closed System

3. Anticipated Injection Pressure:

Average Injection Pressure: 2,520 PSI (surface pressure)

Maximum Injection Pressure: 3,360 PSI (surface pressure)

4. The injection fluid is to be locally produced water. Attached are produced water sample analyses taken from the closest wells that feature samples from the Delaware, Bone Spring, and Wolfcamp formations.

5. The disposal interval is non-productive. No water samples are available from the surrounding area.

VIII. Geological Data

The Devonian formation is a dolomitic ramp carbonate that occurs below the Woodford shale and above the Fusselman formation. Strata found in the Devonian formation include two major groups, the Wristen Buildups and the Thirtyone Deepwater Chert, with the Wristen being more abundant. The Wristen Groups is composed of mixed limestone and dolomites with mudstone to grainstone and boundstone textures. Porosity in the Wristen group is a result of both primary and secondary development. Present are moldic, vugular, karstic (including collapse breccia) features that allow for higher porosities and permeabilities. The Thirtyone Formation contains two end-member reservoir facies, skeletal packstones/grainstones and spiculitic chert, with most of the porosity and permeability found in the coarsely crystalline cherty dolomite. These particular characteristics allow for this formation to be a tremendous Salt Water Disposal horizon.

A. Injection Zone: Siluro-Devonian Formation

Formation	Depth
Rustler	791'
Salado	1,105'
Delaware	4,759'
Bone Spring	8,559'
Wolfcamp	11,969'
Penn	13,352'
Atoka	13,729'
Morrow	14,589'
Mississippian Lime	16,174'
Woodford	16,569'
Devonian	16,769'

B. Underground Sources of Drinking Water

Within 1-mile of the proposed Jack Tank 1 SWD #1 location, the only reported water well has a depth of 600 ft and a water depth of 380 ft. Water wells in the surrounding area have an average depth of 741 ft and an average water depth of 352 ft generally producing from the Santa Rosa. The upper Rustler may also be another USDW and will be protected.

IX. Proposed Stimulation Program

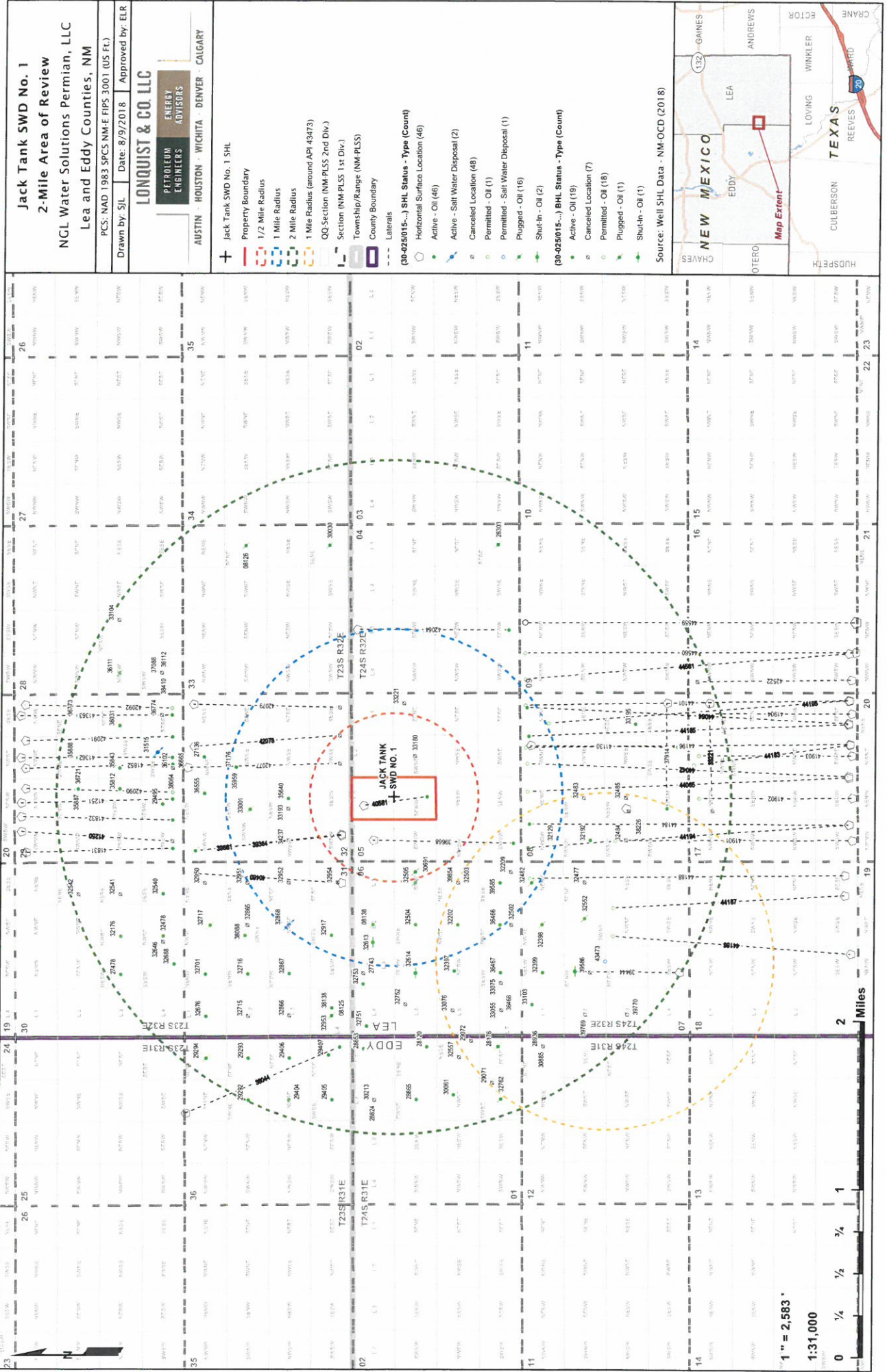
Stimulate with up to 50,000 gallons of acid.

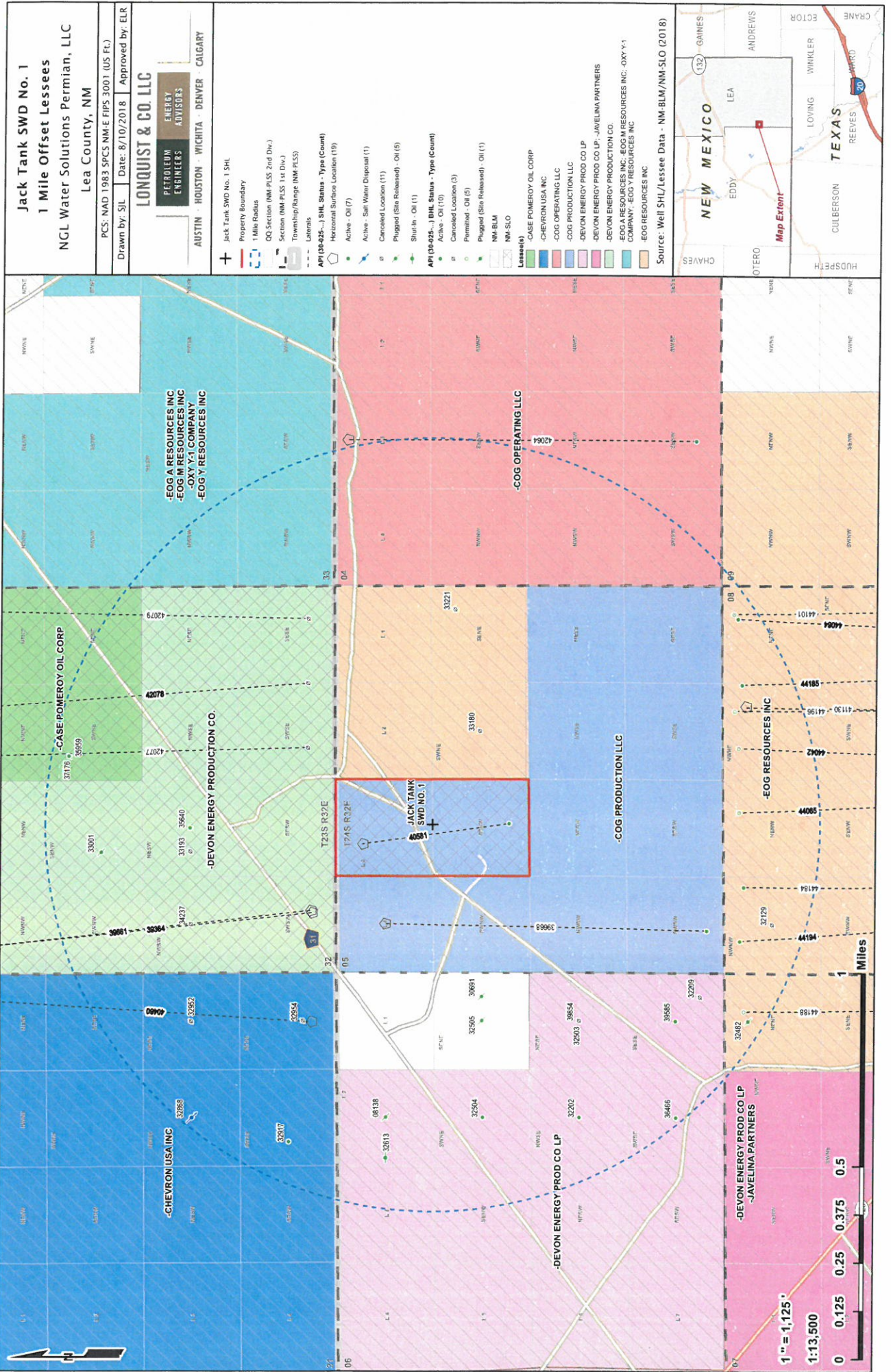
X. Logging and Test Data on the Well

There are no logs or test data on the well. During the process of drilling and completion resistivity, gamma ray, and density logs will be run.

XI. Chemical Analysis of Fresh Water Wells

There is one water well that exists within one mile of the well location. A fresh water sample was obtained from C-03555 and a map and the Water Right Summary from the New Mexico Office of the State Engineer are attached.







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)		(NAD83 UTM in meters)	
		Q64	Q16	Q4	Sec	Tws	Rng	X	Y
C	03555 POD1	2	2	1	05	24S	32E	622709	3569231 
Driller License: 1654		Driller Company: NOT WORKING FOR HIRE--SIRMAN DRILLING AND CONSTRUC							
Driller Name: JOHN SIRMAN									
Drill Start Date: 10/20/2013		Drill Finish Date: 10/21/2013		Plug Date:					
Log File Date: 11/07/2013		PCW Rcv Date:		Source: Shallow					
Pump Type:		Pipe Discharge Size:		Estimated Yield: 5 GPM					
Casing Size: 6.00		Depth Well: 600 feet		Depth Water: 380 feet					
Water Bearing Stratifications:		Top	Bottom	Description					
		475	550	Sandstone/Gravel/Conglomerate					
Casing Perforations:		Top	Bottom						
		460	520						

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

WELL LOCATION: 1,400' FNL & 1,853' FWL
FOOTAGE LOCATION

WELL CONSTRUCTION DATA
Surface Casing

UNIT LETTER	SECTION	TOWNSHIP	RANGE
F	05	24S	32E
<u>WELL CONSTRUCTION DATA</u>			
<u>Surface Casing</u>			
Hole Size: <u>24.000"</u>	Casing Size: <u>20.000"</u>		
Cemented with: <u>1,616</u> sx.	<i>or</i> _____ ft ³		
Top of Cement: <u>Surface</u>	Method Determined: <u>Circulation</u>		
<u>1st Intermediate Casing</u>			
Hole Size: <u>17.500"</u>	Casing Size: <u>13.375"</u>		
Cemented with: <u>2,713</u> sx.	<i>or</i> _____ ft ³		
Top of Cement: <u>Surface</u>	Method Determined: <u>Circulation</u>		
<u>2nd Intermediate Casing</u>			
Hole Size: <u>12.250"</u>	Casing Size: <u>9.625"</u>		
Cemented with: <u>3,218</u> sx.	<i>or</i> _____ ft ³		
Top of Cement: <u>Surface</u>	Method Determined: <u>Circulation</u>		

Production Liner

Hole Size: 8.500"

Casing Size: 7.625"

Cemented with: 350 sx.

or _____ ft³

Top of Cement: 11,700'

Method Determined: Calculation

Total Depth: 16,800'

Injection Interval

16,800 feet to 17,809 feet

(Open Hole)

INJECTION WELL DATA SHEET

Tubing Size: 7", 26 lb/ft, P-110, TCPC from 0' - 11,600' and 5,500", 17 lb/ft, P-110 TCPC from 11,600' - 16,750'
 Lining Material: Duoline

Type of Packer: 7.625" x 5.5" TCPC Permanent Packer with High Temp Elastomer and Full Inconel

Packer Setting Depth: 16,750'

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

Additional Data

1. Is this a new well drilled for injection? X Yes No

If no, for what purpose was the well originally drilled? N/A

2. Name of the Injection Formation: Devonian, Silurian, Fusselman and Montoya (Top 100')

3. Name of Field or Pool (if applicable): SWD; Silurian-Devonian

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, new drill.

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area:

Delaware: 4,759

Bone Spring: 8,559

Wolfcamp: 11,969

XII. Affirmative Statement of Examination of Geologic and Engineering Data

Based on the available engineering and geologic data we find no evidence of open faults or any other hydrologic connection between the disposal zone (in the proposed **Jack Tank SWD #1**) and any underground sources of drinking water.

NAME: John C. Webb

TITLE: Sr. Geologist

SIGNATURE: 

DATE: 8/22/2018

Jack Tank SWD No. 1
1 Mile Area of Review List

API (30-025-...)	WELL NAME	WELL TYPE	STATUS	OPERATOR	TVD (FT.)	LATITUDE (NAD83 DD)	LONGITUDE (NAD83 DD)	DATE DRILLED
08138	PRE-ONGARD WELL #001	O	P	PRE-ONGARD WELL OPERATOR	4796	32.25186920000	-103.71158600000	1/1/1900
30691	PRE-ONGARD WELL #001	O	P	PRE-ONGARD WELL OPERATOR	4855	32.24826050000	-103.70627590000	1/1/1900
32129	JACK TANK 8 FEDERAL #001	O	C	BURLINGTON RESOURCES OIL & GAS CO	99999	32.23738231530	-103.70313154500	12/31/9999
32202	MESA VERDE 6 FEDERAL #002	O	A	DEVON ENERGY PRODUCTION COMPANY, LP	8550	32.24461750000	-103.71163940000	8/26/1993
32209	MESA VERDE 6 FEDERAL #001	O	C	EOG RESOURCES INC	99999	32.24008711640	-103.70634063600	12/31/9999
32482	JACK TANK 7 FEDERAL #002	O	P	BURLINGTON RESOURCES OIL & GAS CO	9900	32.23828130000	-103.70741270000	11/10/1994
32503	MESA VERDE 6 FEDERAL #004I	O	C	DEVON SFS OPERATING INC	0	32.24462190010	-103.70738416600	12/31/9999
32504	MESA VERDE 6 FEDERAL #005	O	A	DEVON ENERGY PRODUCTION COMPANY, LP	9902	32.24823760000	-103.71161650000	5/2/1994
32505	ZIA 6 FEDERAL #001	O	P	DEVON ENERGY PRODUCTION COMPANY, LP	9930	32.24825670000	-103.70734410000	5/20/1994
32613	MESA VERDE 6 FEDERAL #007	O	S	DEVON ENERGY PRODUCTION COMPANY, LP	8760	32.25186160000	-103.71340180000	11/22/1995
32868	SDE 31 FEDERAL #009	S	A	XTO ENERGY, INC	9850	32.25912480000	-103.71157840000	3/11/1995
32917	SDE 31 FEDERAL #015	O	A	XTO ENERGY, INC	8800	32.25549320000	-103.71264650000	1/10/1997
32952	SDE 31 FEDERAL #012	O	C	TEXACO EXPLORATION & PRODUCTION INC	0	32.25914229530	-103.70731854700	12/31/9999
32954	SDE 31 FEDERAL #016	O	C	TEXACO EXPLORATION & PRODUCTION INC	0	32.25496401520	-103.70731515900	12/31/9999
33001	FALCON 32 STATE #001	O	P	DEVON ENERGY PRODUCTION COMPANY, LP	10000	32.26250840000	-103.69983670000	8/28/1995
33180	NAFTA 5 FEDERAL #001	O	C	BURLINGTON RESOURCES OIL & GAS CO	99999	32.24830556270	-103.69455382800	12/31/9999
33193	FALCON 32 STATE #002	O	C	DEVON SFS OPERATING INC	0	32.25917101560	-103.69980950100	12/31/9999
33221	NAFTA 5 FEDERAL #002	O	C	BURLINGTON RESOURCES OIL & GAS CO	0	32.24923324690	-103.68918454400	12/31/9999
34237	FALCON 32 STATE #002	O	C	DEVON SFS OPERATING INC	0	32.25915867900	-103.70302766400	12/31/9999
35640	FALCON 32 STATE #003	O	A	DEVON ENERGY PRODUCTION COMPANY, LP	8690	32.25917430000	-103.69876860000	7/29/2001
35959	STATE IG #002	O	C	HARVARD PETROLEUM COMPANY, LLC	0	32.26368425810	-103.69559687600	12/31/9999
36466	MESA VERDE 6 FEDERAL #003	O	A	DEVON ENERGY PRODUCTION COMPANY, LP	8682	32.24098970000	-103.71166990000	4/26/2004
37176	STATE IG #002	O	A	HARVARD PETROLEUM COMPANY, LLC	8628	32.26371000000	-103.69556430000	4/12/2005
39364	FALCON 32 STATE #005M	O	P	DEVON ENERGY PRODUCTION COMPANY, LP	340	32.25462340000	-103.70254520000	1/17/2010
39585	MESA VERDE 6 FEDERAL #011	O	A	DEVON ENERGY PRODUCTION COMPANY, LP	9921	32.24100490000	-103.70739750000	12/27/2009
39661	FALCON 32 STATE #005Y	O	A	DEVON ENERGY PRODUCTION COMPANY, LP	8387	32.25468060000	-103.70244600000	3/2/2010
39668	TRISTE DRAW 5 FEDERAL #001H	O	A	COG PRODUCTION, LLC	12460	32.25189970000	-103.70304870000	6/25/2010
39854	MESA VERDE 6 FEDERAL #004C	O	C	DEVON ENERGY PRODUCTION COMPANY, LP	0	32.24463270000	-103.70736690000	12/31/9999
40460	SDE 31 FEDERAL #018H	O	A	XTO ENERGY, INC	10635	32.25466160000	-103.70736690000	11/13/2013
40581	TRISTE DRAW 5 FEDERAL COM #002H	O	A	COG PRODUCTION, LLC	8535	32.25273900000	-103.69951630000	5/29/2012
41130	BIMINI 8 FEDERAL COM #002H	O	A	COG PRODUCTION, LLC	8573	32.23836140000	-103.69350430000	7/26/2013
42064	MASTIFF FEDERAL #003H	O	A	COG OPERATING LLC	10652	32.25327300000	-103.68167880000	9/6/2015
42077	JAMES STATE #041C	O	C	CIMAREX ENERGY CO.	0	32.26788710000	-103.69557950000	12/31/9999
42078	JAMES STATE #042C	O	C	CIMAREX ENERGY CO.	0	32.26734540000	-103.69344330000	12/31/9999
42079	JAMES STATE #043C	O	C	CIMAREX ENERGY CO.	0	32.26736450000	-103.68917080000	12/31/9999
44042	MESA VERDE BONE SPRING UNIT #006H	O	N	OXY USA INC	0	32.21098790000	-103.69667100000	1/6/2018
44064	MESA VERDE BONE SPRING UNIT #004H	O	A	OXY USA INC	10447	32.21101310000	-103.69130720000	12/31/9999
44065	MESA VERDE BONE SPRING UNIT #007H	O	N	OXY USA INC	0	32.21098730000	-103.69680040000	1/3/2018
44101	MESA VERDE WOLFCAAMP UNIT #001H	O	N	OXY USA INC	0	32.21099920000	-103.68897930000	12/30/2017
44184	MESA VERDE BONE SPRING UNIT #008H	O	A	OXY USA INC	10403	32.21096220000	-103.70158450000	12/31/9999
44185	MESA VERDE BONE SPRING UNIT #005H	O	A	OXY USA INC	10449	32.21101270000	-103.69140420000	1/29/2018
44188	MESA VERDE BONE SPRING UNIT #010H	O	N	OXY USA INC	0	32.21131660000	-103.70671130000	2/27/2018
44194	MESA VERDE BONE SPRING UNIT #009H	O	A	OXY USA INC	10392	32.21096170000	-103.70158150000	1/22/2018
44196	MESA VERDE BONE SPRING UNIT #002H	O	N	OXY USA INC	0	32.21089330000	-103.69340570000	2/3/2018

Jack Tank SWD #1 - Offsetting Produced Water Analysis															
wellname	api	county	state	formation	ph	tds_mgl	sodium_mgl	calcium_mgl	iron_mgl	magnesium_mgl	manganese_mgl	chloride_mgl	bicarbonate_mgl	sulfate_mgl	co2_mgl
FALCON 32 STATE #005Y	3002539661	Lea	NM	DELAWARE-BRUSHY CANYON	5.9	239678.9	74767.3	13436.5	40.6	2234	2.32	146645.4	73.2	0	420
MESA VERDE 6 FEDERAL #002	3002532202	Lea	NM	DELEWARE	6.98	270965.8	79714.9	19683.5	40.1	2954	5.63	165231.1	24.4	0	320
MESA VERDE 6 FEDERAL #003	3002536466	Lea	NM	DELEWARE	6	281924.3	74484.4	24247.3	188.8	3585	10.33	17354.2	122	0	900
MESA VERDE 6 FEDERAL #005	3002532504	Lea	NM	DELEWARE	6	247168	67097	17110	48	2594	5	156376	695	429	300
MESA VERDE 6 FEDERAL #006	3002532397	Lea	NM	BONE SPRING	7.24	87932.4	29224.9	1557.4	55.7	280.6	0.82	52394.8	1967.7	0	5.9
MESA VERDE 6 FEDERAL #007	3002532613	Lea	NM	BONE SPRING	6.86	256555.1	77637.8	16794	46.4	2698.4	3.11	156655.5	24.4	0	250
MESA VERDE 6 FEDERAL #008	3002532614	Lea	NM	DELEWARE	5.7	281832.3	79586.3	21150	21	3716	6.5	173364	83	607	225
MESA VERDE 6 FEDERAL #009	3002536467	Lea	NM	DELEWARE	6.9	240679.8	74554	12265	32.4	2006.8	2.21	149239.8	36.6	0	250
MESA VERDE 6 FEDERAL #010	3002532751	Lea	NM	AVALON LOWER	6.9	141332	48380	556	215	214	3	88816	2318	1979	700
MESA VERDE 6 FEDERAL #011	3002539585	Lea	NM	BONE SPRING	6.2	233470.3	76027.1	10236.6	103.2	1644.5	2.8	142833.7	185.4	0	400
MESA VERDE 6 FEDERAL #014	3002532753	Lea	NM	BONE SPRING	6.84	258703.1	77318.3	16317.4	47.6	2633	2.97	159717	24.4	0	370
MESA VERDE 7 FEDERAL #001	3002532398	Lea	NM	BONE SPRING	6.92	253400.9	70901.7	20723.2	32.9	3012.4	6.9	155181.1	36.6	0	360
MESA VERDE 7 FEDERAL #002	3002532399	Lea	NM	BONE SPRING	6.87	249018.4	76614.7	12874.5	39.1	2109.7	2.28	154729.2	24.4	0	360
MESA VERDE 7 FEDERAL #003	3002539444	Lea	NM		6	200512	70324	20074	136	2913	9	162623	707	0	700
MESA VERDE 7 FEDERAL #007	3002533103	Lea	NM		6.85	265901.2	76369.9	20703.5	58.1	2990	8.23	162372.7	24.4	0	370
BELLOQ 2 STATE #002H	300154895	EDDY	NM	WOLF CAMP	6.8	119471.8	37359.2	5659.1	22.4	746.1		73172.5		1035.5	250



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

August 21, 2018

Will George

Lonquist Field Services, LLC

3345 Bee Cave Road, Suite 201

Austin, TX 78746

RE: JACK TANK SWD #1

Enclosed are the results of analyses for samples received by the laboratory on 08/14/18 14:50.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Total Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Cardinal Laboratories is accredited through the State of New Mexico Environment Department for:

Method SM 9223-B	Total Coliform and E. coli (Colilert MMO-MUG)
Method EPA 524.2	Regulated VOCs and Total Trihalomethanes (TTHM)
Method EPA 552.2	Total Haloacetic Acids (HAA-5)

Accreditation applies to public drinking water matrices for State of Colorado and New Mexico.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Lab Director/Quality Manager



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Lonquist Field Services, LLC
3345 Bee Cave Road, Suite 201
Austin TX, 78746

Project: JACK TANK SWD #1
Project Number: 32.253067
Project Manager: Will George
Fax To: (512) 732-9816

Reported:
21-Aug-18 17:14

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
C-035555-POD 1	H802257-01	Water	14-Aug-18 11:35	14-Aug-18 14:50

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence or any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damage including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 Lonquist Field Services, LLC
 3345 Bee Cave Road, Suite 201
 Austin TX, 78746

 Project: JACK TANK SWD #1
 Project Number: 32.253067
 Project Manager: Will George
 Fax To: (512) 732-9816

 Reported:
 21-Aug-18 17:14

C-035555-POD 1
H802257-01 (Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
---------	--------	-----	-----------------	-------	----------	-------	---------	----------	--------	-------

Cardinal Laboratories
Inorganic Compounds

Alkalinity, Bicarbonate	220		5.00	mg/L	1	8080602	AC	15-Aug-18	310.1	
Alkalinity, Carbonate	<1.00		1.00	mg/L	1	8080602	AC	15-Aug-18	310.1	
Chloride*	168		4.00	mg/L	1	8081511	AC	15-Aug-18	4500-Cl-B	
Conductivity*	3860		1.00	uS/cm	1	8081509	AC	15-Aug-18	120.1	
pH*	7.61		0.100	pH Units	1	8081509	AC	15-Aug-18	150.1	
Resistivity	2.59			Ohms/m	1	8081509	AC	15-Aug-18	120.1	
Specific Gravity @ 60° F	1.002		0.000	[blank]	1	8081507	AC	15-Aug-18	SM 2710F	
Sulfate*	1670		500	mg/L	50	8081510	AC	16-Aug-18	375.4	
TDS*	3320		5.00	mg/L	1	8081401	AC	15-Aug-18	160.1	
Alkalinity, Total*	180		4.00	mg/L	1	8080602	AC	15-Aug-18	310.1	
Sulfide, total	0.188		0.0100	mg/L	1	8081508	AC	15-Aug-18	376.2	

Green Analytical Laboratories
Total Recoverable Metals by ICP (E200.7)

Barium*	0.069		0.050	mg/L	1	B808162	AES	20-Aug-18	EPA200.7	
Calcium*	250		0.100	mg/L	1	B808162	AES	20-Aug-18	EPA200.7	
Iron*	3.12		0.050	mg/L	1	B808162	AES	20-Aug-18	EPA200.7	
Magnesium*	178		0.500	mg/L	5	B808162	AES	21-Aug-18	EPA200.7	
Potassium*	8.38		1.00	mg/L	1	B808162	AES	20-Aug-18	EPA200.7	
Sodium*	504		5.00	mg/L	5	B808162	AES	21-Aug-18	EPA200.7	

Cardinal Laboratories

* = Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence or any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damage including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

Lonquist Field Services, LLC
3345 Bee Cave Road, Suite 201
Austin TX, 78746

Project: JACK TANK SWD #1
Project Number: 32.253067
Project Manager: Will George
Fax To: (512) 732-9816

Reported:
21-Aug-18 17:14

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8080602 - General Prep - Wet Chem										
Blank (8080602-BLK1)				Prepared: 10-Aug-18 Analyzed: 17-Aug-18						
Alkalinity, Carbonate	ND	1.00	mg/L							
Alkalinity, Bicarbonate	ND	5.00	mg/L							
Alkalinity, Total	4.00	4.00	mg/L							
LCS (8080602-BS1)				Prepared: 10-Aug-18 Analyzed: 17-Aug-18						
Alkalinity, Carbonate	ND	2.50	mg/L				80-120			
Alkalinity, Bicarbonate	ND	12.5	mg/L				80-120			
Alkalinity, Total	270	10.0	mg/L	250		108	80-120			
LCS Dup (8080602-BSD1)				Prepared: 10-Aug-18 Analyzed: 17-Aug-18						
Alkalinity, Carbonate	ND	2.50	mg/L				80-120		20	
Alkalinity, Bicarbonate	ND	12.5	mg/L				80-120		20	
Alkalinity, Total	270	10.0	mg/L	250		108	80-120	0.00	20	
Batch 8081401 - Filtration										
Blank (8081401-BLK1)				Prepared: 14-Aug-18 Analyzed: 16-Aug-18						
TDS	ND	5.00	mg/L							
LCS (8081401-BS1)				Prepared: 14-Aug-18 Analyzed: 15-Aug-18						
TDS	522	5.00	mg/L	527		99.1	80-120			
Duplicate (8081401-DUP1)				Prepared: 14-Aug-18 Analyzed: 15-Aug-18						
TDS	4680	5.00	mg/L		4510			3.66	20	
Batch 8081507 - General Prep - Wet Chem										
Duplicate (8081507-DUP1)				Source: H802257-01 Prepared & Analyzed: 15-Aug-18						
Specific Gravity @ 60° F	1.001	0.000	[blank]		1.002			0.120	20	

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence or any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damage including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

Lonquist Field Services, LLC
3345 Bee Cave Road, Suite 201
Austin TX, 78746

Project: JACK TANK SWD #1
Project Number: 32.253067
Project Manager: Will George
Fax To: (512) 732-9816

Reported:
21-Aug-18 17:14

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 8081508 - General Prep - Wet Chem

Blank (8081508-BLK1)

Prepared & Analyzed: 15-Aug-18

Sulfide, total ND 0.0100 mg/L

Duplicate (8081508-DUP1)

Source: H802257-01

Prepared & Analyzed: 15-Aug-18

Sulfide, total 0.191 0.0100 mg/L 0.188 1.27 20

Batch 8081509 - General Prep - Wet Chem

LCS (8081509-BS1)

Prepared & Analyzed: 15-Aug-18

Conductivity 479 uS/cm 500 95.8 80-120
pH 7.05 pH Units 7.00 101 90-110

Duplicate (8081509-DUP1)

Source: H802257-01

Prepared & Analyzed: 15-Aug-18

Conductivity 3860 1.00 uS/cm 3860 0.00 20
pH 7.60 0.100 pH Units 7.61 0.131 20
Resistivity 2.59 Ohms/m 2.59 0.00 20

Batch 8081510 - General Prep - Wet Chem

Blank (8081510-BLK1)

Prepared & Analyzed: 16-Aug-18

Sulfate ND 10.0 mg/L

LCS (8081510-BS1)

Prepared & Analyzed: 16-Aug-18

Sulfate 18.9 10.0 mg/L 20.0 94.6 80-120

LCS Dup (8081510-BSD1)

Prepared & Analyzed: 16-Aug-18

Sulfate 16.8 10.0 mg/L 20.0 84.2 80-120 11.6 20

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence or any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damage including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 Lonquist Field Services, LLC
 3345 Bee Cave Road, Suite 201
 Austin TX, 78746

 Project: JACK TANK SWD #1
 Project Number: 32.253067
 Project Manager: Will George
 Fax To: (512) 732-9816

 Reported:
 21-Aug-18 17:14

Inorganic Compounds - Quality Control
Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8081511 - General Prep - Wet Chem										
Blank (8081511-BLK1)				Prepared & Analyzed: 15-Aug-18						
Chloride	ND	4.00	mg/L							
LCS (8081511-BS1)				Prepared & Analyzed: 15-Aug-18						
Chloride	100	4.00	mg/L	100		100	80-120			
LCS Dup (8081511-BSD1)				Prepared & Analyzed: 15-Aug-18						
Chloride	100	4.00	mg/L	100		100	80-120	0.00	20	

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence or any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damage including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

Analytical Results For:

Lonquist Field Services, LLC
3345 Bee Cave Road, Suite 201
Austin TX, 78746

Project: JACK TANK SWD #1
Project Number: 32.253067
Project Manager: Will George
Fax To: (512) 732-9816

Reported:
21-Aug-18 17:14

Total Recoverable Metals by ICP (E200.7) - Quality Control**Green Analytical Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch B808162 - Total Rec. 200.7/200.8/200.2**Blank (B808162-BLK1)**

Prepared: 17-Aug-18 Analyzed: 20-Aug-18

Iron	ND	0.050	mg/L							
Potassium	ND	1.00	mg/L							
Barium	ND	0.050	mg/L							
Magnesium	ND	0.100	mg/L							
Calcium	ND	0.100	mg/L							
Sodium	ND	1.00	mg/L							

LCS (B808162-BS1)

Prepared: 17-Aug-18 Analyzed: 20-Aug-18

Sodium	3.34	1.00	mg/L	3.24		103	85-115			
Potassium	8.09	1.00	mg/L	8.00		101	85-115			
Magnesium	20.2	0.100	mg/L	20.0		101	85-115			
Iron	3.96	0.050	mg/L	4.00		99.0	85-115			
Calcium	4.05	0.100	mg/L	4.00		101	85-115			
Barium	2.05	0.050	mg/L	2.00		102	85-115			

LCS Dup (B808162-BSD1)

Prepared: 17-Aug-18 Analyzed: 20-Aug-18

Magnesium	19.7	0.100	mg/L	20.0		98.6	85-115	2.60	20	
Potassium	8.14	1.00	mg/L	8.00		102	85-115	0.632	20	
Calcium	3.99	0.100	mg/L	4.00		99.7	85-115	1.54	20	
Sodium	3.23	1.00	mg/L	3.24		99.6	85-115	3.27	20	
Barium	2.04	0.050	mg/L	2.00		102	85-115	0.286	20	
Iron	3.94	0.050	mg/L	4.00		98.6	85-115	0.419	20	

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence or any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damage including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence or any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damage including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Celey D. Keene, Lab Director/Quality Manager

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

[illegible]

CARDINAL LABORATORIES
SCALE INDEX WATER ANALYSIS REPORT

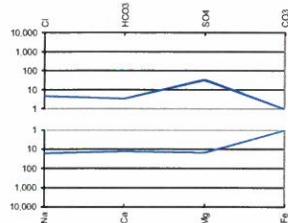
Company : LONQUIST FIELD SERVICES, LLC
Lease Name : JACK TANK SWD #1
Well Number : C-03555-POD1 (H802257-01)
Location : 32.253067

Date Sampled : 08/14/18
Company Rep. : CHRIS WEYAND

ANALYSIS

1. pH	7.61				
2. Specific Gravity @ 60/60 F.	1.0020				
3. CaCO3 Saturation Index @ 80 F.	+0.293				'Calcium Carbonate Scale Possible'
@ 140 F.	+0.993				'Calcium Carbonate Scale Possible'
Dissolved Gasses					
4. Hydrogen Sulfide	0.188	PPM			
5. Carbon Dioxide	ND	PPM			
6. Dissolved Oxygen	ND	PPM			
Cations					
7. Calcium (Ca++)	250.00	/	Eq. Wt.	=	MEQ/L
8. Magnesium (Mg++)	178.00	/	20.1	=	12.44
9. Sodium (Na+)	504	/	12.2	=	14.59
10. Barium (Ba++)	0.069	/	23.0	=	15.53
			68.7	=	0.00
Anions					
11. Hydroxyl (OH-)	0	/	17.0	=	0.00
12. Carbonate (CO3=)	0	/	30.0	=	0.00
13. Bicarbonate (HCO3-)	220	/	61.1	=	3.60
14. Sulfate (SO4=)	1,670	/	48.8	=	34.22
15. Chloride (Cl-)	168	/	35.5	=	4.73
Other					
16. Total Iron (Fe)	3.120	/	18.2	=	0.17
17. Total Dissolved Solids	3,320				
18. Total Hardness As CaCO3	1,357.0				
19. Calcium Sulfate Solubility @ 90 F.	1,421				
20. Resistivity (Measured)	2.590	Ohm/Meters		@ 77	Degrees (F)

Logarithmic Water Pattern



PROBABLE MINERAL COMPOSITION

COMPOUND	Eq. Wt.	X	MEQ/L	=	mg/L
Ca(HCO3)2	81.04	X	3.60	=	292
CaSO4	68.07	X	8.84	=	602
CaCl2	55.50	X	0.00	=	0
Mg(HCO3)2	73.17	X	0.00	=	0
MgSO4	60.19	X	14.59	=	878
MgCl2	47.62	X	0.00	=	0
NaHCO3	84.00	X	0.00	=	0
NaSO4	71.03	X	10.79	=	767
NaCl	58.46	X	4.73	=	277

ND = Not Determined

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 and Natural Resources

Form C-101
Revised July 18, 2013

Oil Conservation Division

☐ AMENDED REPORT

1220 South St. Francis Dr.

Santa Fe, NM 87505

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

¹ Operator Name and Address NGL WATER SOLUTIONS PERMIAN, LLC 1509 W WALL ST, STE 306 MIDLAND, TX 79701		² OGRID Number 372338
		³ API Number TBD
⁴ Property Code	⁵ Property Name JACK TANK SWD	⁶ Well No. 1

7. Surface Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
F	05	24S	32E	N/A	1,400'	NORTH	1,853'	WEST	LEA

8. Proposed Bottom Hole Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
-	-	-	-	-	-	-	-	-	-

9. Pool Information

Pool Name SWD; Silurian-Devonian	Pool Code 96101
-------------------------------------	--------------------

Additional Well Information

¹¹ Work Type N	¹² Well Type SWD	¹³ Cable/Rotary R	¹⁴ Lease Type Private	¹⁵ Ground Level Elevation 3,605'
¹⁶ Multiple N	¹⁷ Proposed Depth 17,809'	¹⁸ Formation Siluro-Devonian	¹⁹ Contractor TBD	²⁰ Spud Date ASAP
Depth to Ground water 380'		Distance from nearest fresh water well 1,156'		Distance to nearest surface water > 1 mile

☐ We will be using a closed-loop system in lieu of lined pits

21. Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surface	24"	20"	94 lb/ft	1,250'	1,616	Surface
Intermediate	17.5"	13.375"	68 lb/ft	4,770'	2,713	Surface
Production	12.25"	9.625"	53.5 lb/ft	12,200'	3,218	Surface
Prod. Liner	8.5"	7.625"	39 lb/ft	16,800'	350	11,700
Tubing	N/A	7"	26 lb/ft	0' - 11,600'	N/A	N/A
Tubing	N/A	5.5"	17 lb/ft	11,600' - 16750'	N/A	N/A

Casing/Cement Program: Additional Comments

See attached schematic.

22. Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Double Hydraulic/Blinds, Pipe	10,000 psi	8,000 psi	TBD - Schaffer/Cameron

²³ I hereby certify that the information given above is true and complete to the best of my knowledge and belief. I further certify that I have complied with 19.15.14.9 (A) NMAC ☐ and/or 19.15.14.9 (B) NMAC ☒, if applicable. Signature:	OIL CONSERVATION DIVISION	
	Approved By:	
	Title:	
	Approved Date:	Expiration Date:
	Conditions of Approval Attached	

Printed name: Christopher B. Weyand	
Title: Consulting Engineer	
E-mail Address: chris@lonquist.com	
Date: 8/2/2018	Phone: (512) 600-1764

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-10
Revised August 1
201
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number	² Pool Code 96101	³ Pool Name SWD; Silurian-Devonian
⁴ Property Code	⁵ Property Name JACK TANK SWD	⁶ Well Number 1
⁷ OGRID No. 372338	⁸ Operator Name NGL WATER SOLUTIONS PERMIAN, LLC	⁹ Elevation 3605.00'±

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
F	05	24 S	32 E	N/A	1400'	NORTH	1853'	WEST	LEA

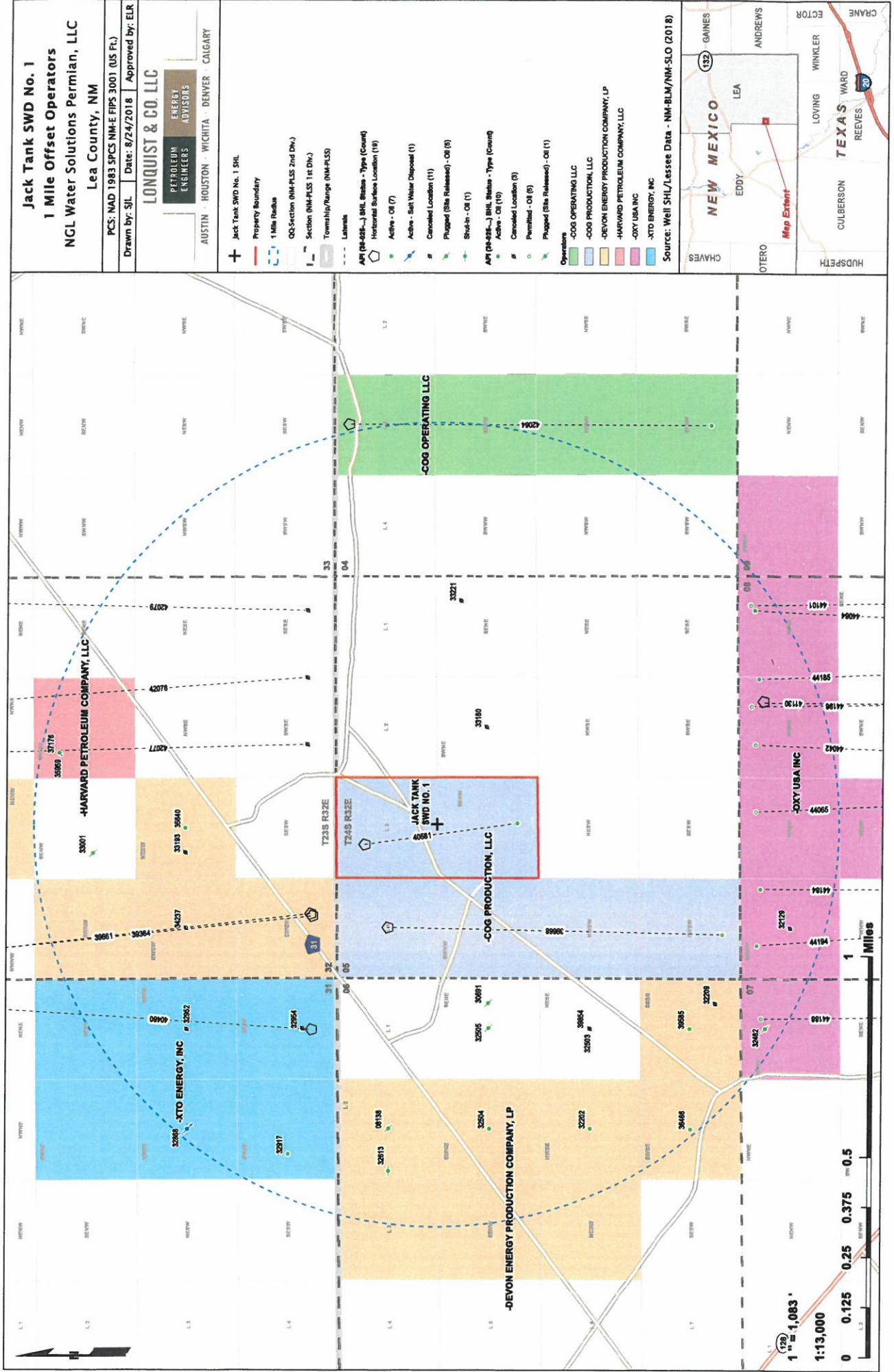
¹¹ Bottom Hole Location If Different From Surface

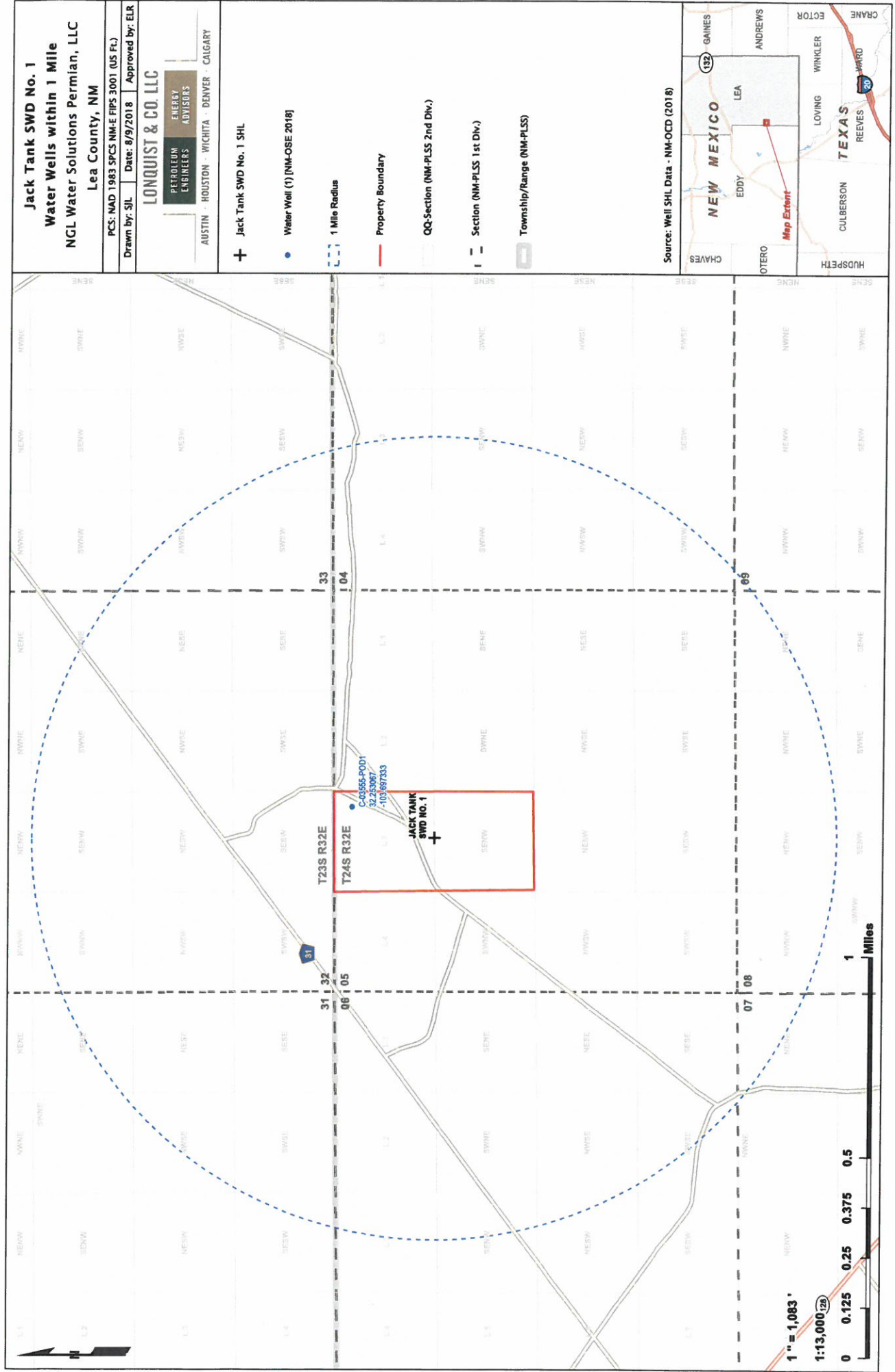
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

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.

	PROPOSED JACK TANK SWD 1 NMSP-E (NAD27) N: 455,242.10' E: 696,345.60' NMSP-E (NAD83) N: 455,301.20' E: 737,529.40' Lat: N32°15'00.38" Long: W103°41'55.35"	¹⁷ OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete the best of my knowledge and belief, and that this organization either owns 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.
	SECTION 05	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.
	Date of Survey 8/19/18 Signature and Seal of Professional Surveyor 	





Zina Crum
Modrall Sperling
500 4th Street NW
Suite 1000
Albuquerque NM 87102

PS Form 3877

Type of Mailing: CERTIFIED
09/18/2018

Firm Mailing Book ID: 151704

Line	Article Number	Name, Street & P.O. Address	Postage	Fee	R.R.Fee	Reference	Rest.Del.Fee Contents
1	9314 8699 0430 0050 9171 23	Oil Conservation Division District 1 - Hobbs 1625 N. French Drive Hobbs NM 88240	\$1.63	\$3.45	\$1.50	87806-0003	\$0.00 Notice
2	9314 8699 0430 0050 9171 30	NEW MEXICO STATE LAND OFFICE P.O. Box 1148 Santa Fe NM 87504	\$1.63	\$3.45	\$1.50	87806-0003	\$0.00 Notice
3	9314 8699 0430 0050 9171 47	BUREAU OF LAND MGMT 301 Dinosaur Trail Santa Fe NM 87508	\$1.63	\$3.45	\$1.50	87806-0003	\$0.00 Notice
4	9314 8699 0430 0050 9171 54	XTO ENERGY, INC 6401 Holiday Hill Road Building #5 Midland TX 79707	\$1.63	\$3.45	\$1.50	87806-0003	\$0.00 Notice
5	9314 8699 0430 0050 9171 61	CHEVRON USA INC 6301 DEAUVILLE Midland TX 79706	\$1.63	\$3.45	\$1.50	87806-0003	\$0.00 Notice
6	9314 8699 0430 0050 9171 85	DEVON ENERGY PRODUCTION COMPANY, LP 20 N Broadway Oklahoma City OK 73102	\$1.63	\$3.45	\$1.50	87806-0003	\$0.00 Notice
7	9314 8699 0430 0050 9171 92	DEVON ENERGY PRODUCTION COMPANY, LP 333 W. SHERIDAN AVENUE Oklahoma City OK 73012	\$1.63	\$3.45	\$1.50	87806-0003	\$0.00 Notice
8	9314 8699 0430 0050 9172 08	HARVARD PETROLEUM COMPANY, LLC P.O. Box 936 Roswell NM 88202	\$1.63	\$3.45	\$1.50	87806-0003	\$0.00 Notice
9	9314 8699 0430 0050 9172 15	CASE-POMEROY OIL CORP 16666 NORTH CASE DR STE 475 Houston TX 77060	\$1.63	\$3.45	\$1.50	87806-0003	\$0.00 Notice
10	9314 8699 0430 0050 9172 22	OXY Y-1 COMPANY PO BOX 27570 Houston TX 77227	\$1.63	\$3.45	\$1.50	87806-0003	\$0.00 Notice
11	9314 8699 0430 0050 9172 39	EOG A RESOURCES INC 105 S 4TH Street Artesia NM 88210	\$1.63	\$3.45	\$1.50	87806-0003	\$0.00 Notice
12	9314 8699 0430 0050 9172 46	EOG M RESOURCES INC P.O. Box 840 Artesia NM 88211	\$1.63	\$3.45	\$1.50	87806-0003	\$0.00 Notice
13	9314 8699 0430 0050 9172 53	EOG Y RESOURCES INC 104 S. 4th St. Artesia NM 88210	\$1.63	\$3.45	\$1.50	87806-0003	\$0.00 Notice
14	9314 8699 0430 0050 9172 60	COG PRODUCTION, LLC P.O. Box 2064 Midland TX 79702	\$1.63	\$3.45	\$1.50	87806-0003	\$0.00 Notice
15	9314 8699 0430 0050 9172 77	COG PRODUCTION, LLC 600 W ILLINOIS AVE Midland TX 79701	\$1.63	\$3.45	\$1.50	87806-0003	\$0.00 Notice

Zina Crum
Modrall Sperling
500 4th Street NW
Suite 1000
Albuquerque NM 87102

PS Form 3877

Type of Mailing: CERTIFIED
09/18/2018

Firm Mailing Book ID: 151704



Line	Article Number	Name, Street & P.O. Address	Postage	Fee	R.R.Fee	Reference	Rest.Del.Fee Contents
16	9314 8699 0430 0050 9172 84	COG OPERATING LLC 550 W Texas Midland TX 79701	\$1.63	\$3.45	\$1.50	87806-0003	\$0.00 Notice
Totals:			\$26.08	\$55.20	\$24.00		\$0.00
			Grand Total:				\$105.28

List Number of Pieces
Listed by Sender

Total Number of Pieces
Received at Post Office

Postmaster:
Name of receiving employee

Dated: