Initial Application Part I

Received: **12/11/2019**

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

GA6A9-191211-C-1080

Revised March 23, 2017

RECEIVED: 12/11/19	REVIEWER: BLL	TYPE: SWD	APP NO: pBL1934553688

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: Permian Water Solutions, LLC **OGRID Number:** 373626
Well Name: Rusty Nail SWD 1 **API:** 30-015-
Pool: SWD; 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

SWD-2352

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.

Brian Wood
Print or Type Name

R. Wood
Signature

12-10-19
Date

505 466-8120
Phone Number

brian@permitswest.com
e-mail Address

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

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

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: _____Secondary Recovery _____Pressure Maintenance XXX Disposal _____Storage
Application qualifies for administrative approval? XXX Yes _____No

II. OPERATOR: PERMIAN WATER SOLUTIONS, LLC

ADDRESS: 600 TRAVIS ST., SUITE 4700, HOUSTON TX 77002

CONTACT PARTY: BRIAN WOOD (PERMITS WEST, INC.) PHONE: 505 466-8120

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 XXX 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.

Rusty Nail SWD 1

VII. Attach data on the proposed operation, including:

Devonian (96101)

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: BRIAN WOOD TITLE: CONSULTANT

SIGNATURE: DATE: DEC. 9, 2019

E-MAIL ADDRESS: brian@permitswest.com

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

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

Side 2

III. WELL DATA

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

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

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

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

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

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

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

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

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

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

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

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

XIV. PROOF OF NOTICE

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

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

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

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

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

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

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

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

Side 1

INJECTION WELL DATA SHEET

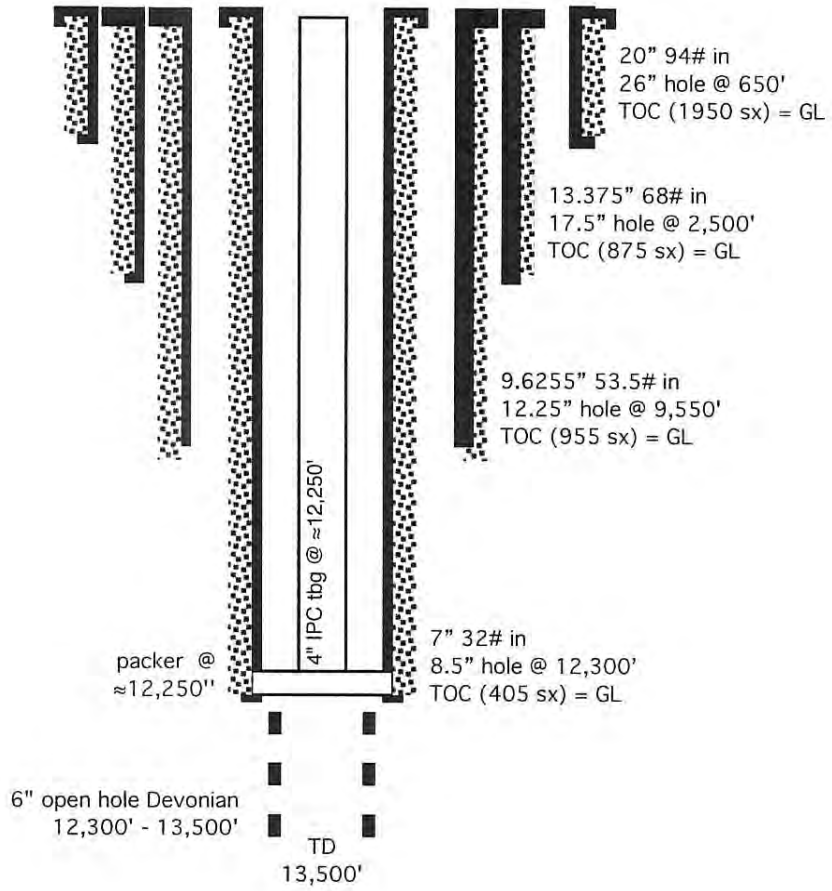
OPERATOR: PERMIAN WATER SOLUTIONS, LLC

WELL NAME & NUMBER: RUSTY NAIL SWD 1

WELL LOCATION:	A	27	20 S	28 E
333' FNL & 1144' FEL				
FOOTAGE LOCATION	UNIT LETTER	SECTION	TOWNSHIP	RANGE

WELLBORE SCHEMATIC

(not to scale)



WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 26" Casing Size: 20"

Cemented with: 1950 sx. *or* _____ ft³

Top of Cement: GL Method Determined: CIRC.

Intermediate Casing

17.5" 13.375"

Hole Size: 12.25" Casing Size: 9.625"

875

Cemented with: 955 sx. *or* _____ ft³

Top of Cement: GL Method Determined: CIRC. & CBL

Production Casing

Hole Size: 8.5" Casing Size: 7" @ 12,300'

Cemented with: 405 sx. *or* _____ ft³

Top of Cement: GL Method Determined: CBL

Total Depth: CSG @ 12,300' & TD @ 13,500'

Injection Interval

6.0" OPEN HOLE 12,300 feet to 13,500'

(Perforated or Open Hole; indicate which)

Side 2

INJECTION WELL DATA SHEET

Tubing Size: 4" Lining Material: IPC

Type of Packer: 4" x 7" STAINLESS STEEL OR NICKEL

Packer Setting Depth: ≈12,250'

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

Additional Data

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

   If no, for what purpose was the well originally drilled? _____

2. Name of the Injection Formation: DEVONIAN

3. Name of Field or Pool (if applicable): SWD; DEVONIAN (POOL CODE 96101)

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

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

   OVER:YATES (760'), DELAWARE (2890'), BONE SPRING (5270'), WOLFCAMP (8850'), STRAWN (10030'), ATOKA (10450'), & MORROW (10765')

   UNDER: NONE

PERMIAN WATER SOLUTIONS, LLC
RUSTY NAIL SWD 1
333' FNL & 1144' FEL
SEC. 27, T. 20 S., R. 28 E., EDDY COUNTY, NM

I. Goal is to drill a 13,500' deep commercial saltwater disposal well. Proposed disposal interval will be 12,300' - 13,500' in the SWD; Devonian (96101). See Exhibit A for C-102 and map. Well is on fee surface and fee minerals.

II. Operator: Permian Water Solutions, LLC [OGRID 373626]
Operator phone number: (432) 305-4124
Operator address: 600 Travis St., Suite 4700
Houston, TX 77002
Contact for Application: Brian Wood (Permits West, Inc.)
Phone: (505) 466-8120

III. A. (1) Lease name: Rusty Nail SWD (fee)
Well name and number: Rusty Nail SWD 1
Location: 333' FNL & 1144' FEL Section 27, T. 20 S., R. 28 E.

A. (2) Surface casing (20", 94#) will be set at 650' in a 26" hole and cemented to GL with 1950 sacks.

Intermediate casing 1 (13.375", 68#) will be set at 2500' in a 17.5" hole and cemented with 875 sacks.

Intermediate casing 2 (9.625", 53.5#) will be set at 9,550' in a 12.25" hole and cemented with 955 sacks.

Intermediate casing 3 (7", 32#) will be set at 12,300' in an 8.5" hole and cemented with 405 sacks. Intermediate casing strings will be cemented to GL.

A 6" open hole will be drilled to 13,500'.

A. (3) Tubing will be IPC, 4", P-110 set at ≈12,250'. (Disposal interval will be 12,300' to 13,500'.)

A. (4) A stainless-steel or nickel 4" x 7" packer will be set at ≈12,250' (or ≤100' above the top of the open hole which will be at 12,300').

B. (1) Disposal zone will be the Devonian (SWD; Devonian (96101) pool). Estimated fracture gradient is ≈0.65 psi per foot.

B. (2) Disposal interval will be open hole from 12,300' to 13,500'.

B. (3) Well has not been drilled. It will be drilled as a saltwater disposal well.

B. (4) No perforated intervals are in the well.

B. (5) Productive zones in the area of review and above the Devonian (12,275') are the Yates (760'), Delaware (2,890'), Bone Spring (5,270'), Wolfcamp (8,850'), Strawn (10,030'), Atoka (10,450') and Morrow (10,765'). No oil or gas zone is below the Devonian in the area of review.

IV. This is not an expansion of an existing injection project. It is disposal only.

V. Exhibit B shows and tabulates the 27 existing wells within a one mile radius. Eighteen of the wells are P&A. Deepest of the 27 wells is 11,600' TVD. Exhibit C shows all 136 existing wells (3 water + 44 oil or gas + 88 P&A + 1 SWD (Delaware) within a two-mile radius.

All leases within a one-mile radius are BLM, fee, or NMSLO. Exhibit D shows and tabulates all leases within a one-mile radius. Two-mile radius leases are BLM, fee, or NMSLO (Exhibit E).

VI. No Devonian penetrator is within a mile. Deepest (11,600' TVD) well within a mile bottomed in the Barnett, 675' above the Devonian. (APD and SWD approval for a Devonian; SWD well (30-015-41982) 0.91 mile south expired in 2017 prior to drilling.)

VII. 1. Average injection rate will be ≈25,000 bwpd.
Maximum injection rate will be 30,000 bwpd.

2. System will be open and closed. Water will both be trucked and piped.

3. Average injection pressure will be ≈2,250 psi.
Maximum injection pressure will be 2,460 psi (= 0.2 psi/foot x 12,300' (top of open hole)).

4. Disposal water will be produced water, mainly Bone Spring and Wolfcamp. There are 153 approved Bone Spring wells and 54 approved Wolfcamp wells in T. 20 S., R. 28 E and the adjacent T. 21 S., R. 27 E. The well will take other Permian Basin waters (e. g., Delaware, Morrow) too. Abstracts from the NM Produced Water Quality Database v.2 for wells in T. 20 S., R. 28 E. are in Exhibit F. A table of TDS ranges from those wells in T. 20 S., R. 28 E. is below. Two Devonian samples from 30-015-02475 (10 miles southeast) found TDS at 16,223 and 19,941.

Formation	TDS range (mg/l)
Artesia	3,211 – 81,000
Bone Spring	1,595 – 197,409
Capitan	22,198 – 22,205
Delaware	7,792 – 161,114
Morrow	31,643 – 44,978
Rustler	3,735
San Andres	210,774
Tansill	3,237 – 3,728
Wolfcamp	40,785 – 297,557

No compatibility problems have been reported from the closest active Devonian; SWD wells. At least 9,893,315 barrels have been disposed in 30-015-30828 (2.8 miles northeast) and 1,400,298 barrels have been disposed in 30-015-32274 (2.8 miles southwest).

5. Closest Devonian producer (30-015-05614) is >17 miles northeast.

VIII. The Devonian (estimated 1200' thick) consists of limestone and dolomite. Closest possible underground source of drinking water above the proposed disposal interval are the Quaternary red beds at the surface. According to State Engineer records (Exhibit G), deepest water well within 2 miles is 170' deep and closest water well is 1.18 mile southeast. No underground source of drinking water is below the proposed disposal interval.

Estimated formation tops are:

Quaternary = 0'
Yates = 760'
Capitan = 965'
Delaware = 2890'
Bone Spring = 5270'
Wolfcamp = 8850'
Strawn = 10030'
Atoka = 10450'
Morrow = 10765'
Barnett = 11355'
Devonian = 12275'
disposal interval = 12300' - 13500'
TD = 13500'

According to State Engineer records (Exhibit G), closest water well is 1.18 mile southeast. Its depth is 109'. There will be >12,000' of vertical separation including shale, salt, and anhydrite intervals between the bottom of the only likely underground water source (Quaternary red beds) and the top of the Devonian.

IX. Well will be stimulated with acid as needed.

X. Deviation surveys and CBL, CNL, GR, and DLL logs will be run.

XI. According to State Engineer records (Exhibit G), three water wells are within a 2-mile radius. None were found during a September 24, 2019 field inspection.

However, two water wells (0.28 mile south and 1.22 mile WNW) not in the State Engineer records were found and sampled that day. Well is in the Capitan Reef and all casing strings will be cemented to the surface.

XII. Permian Water Solutions, LLC (Exhibit H) is not aware of any geologic or engineering data that may indicate the Devonian is in hydrologic connection with any underground sources of water. Deepest water well within a 2-mile radius is 250'. There are 256 approved Devonian SWD APDs in New Mexico, of which 154 are active. Closest Quaternary fault is ≈56 miles southwest.

XIII. A legal ad (Exhibit I) was published on November 19, 2019. Notice (Exhibit J) and this application has been sent to the surface owner (Harley & Carol Ballard), all well operators regardless of depth, government lessors, lessees, and operating right holders within a mile.

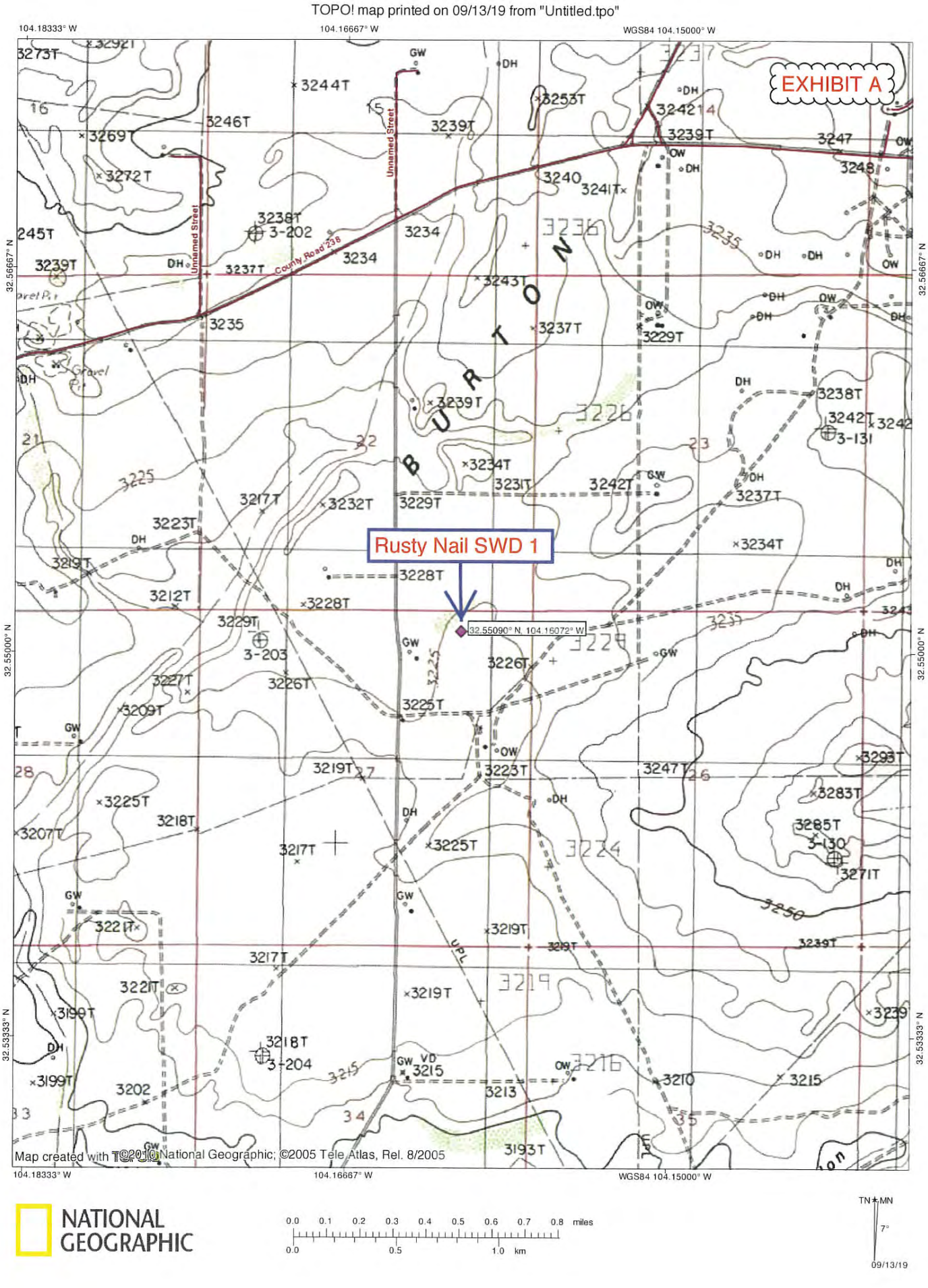

TOPO! map printed on 09/13/19 from "Untitled.tpo"
104.18333° W
104.16667° W
WGS84 104.15000° W
EXHIBIT A
Rusty Nail SWD 1
32.55090° N, 104.16072° W
Unnamed Street
County Road 238
BURTON
Gravel Pit
3-202
3-131
3-203
3-130
3-204
32.56667° N
32.55000° N
32.53333° N
Map created with TOPO! ©2010 National Geographic; ©2005 Tele Atlas, Rel. 8/2005
NATIONAL GEOGRAPHIC
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 miles
0.0 0.5 1.0 km
TN 7° MN
09/13/19

EXHIBIT A

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

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

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-015-	96101	SWD; Devonian

[4] Property Code	[5] Property Name	[6] Well Number
	RUSTY NAIL SWD	1

[7] OGRID No.	[8] Operator Name	[9] Elevation
373626	PERMIAN WATER SOLUTIONS, LLC	3227'±

[10] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	27	20 S	28 E	N/A	333'	NORTH	1144'	EAST	EDDY

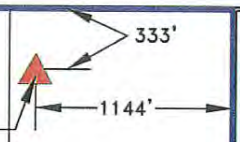
[11] Bottom Hole Location If Different From Surface

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

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

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

[16]



NMSP-E (NAD27)
N: 564132.31'
E: 553341.10'

NMSP-E (NAD83)
N: 564193.52'
E: 594521.53'
LAT: N032.550906
LONG: W104.160725

SECTION 27

[17] OPERATOR CERTIFICATION

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

10-20-19
Signature Date

BRIAN WOOD
Printed Name

brian@permitswest.com
E-mail Address

(505) 466-8120

[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.

6/24/19
Date of Survey

Signature and Seal of Professional Surveyor

STANLEY W. DRANNON
STATE OF NEW MEXICO
NO. 23002
REGISTERED PROFESSIONAL SURVEYOR

23002
Certificate Number

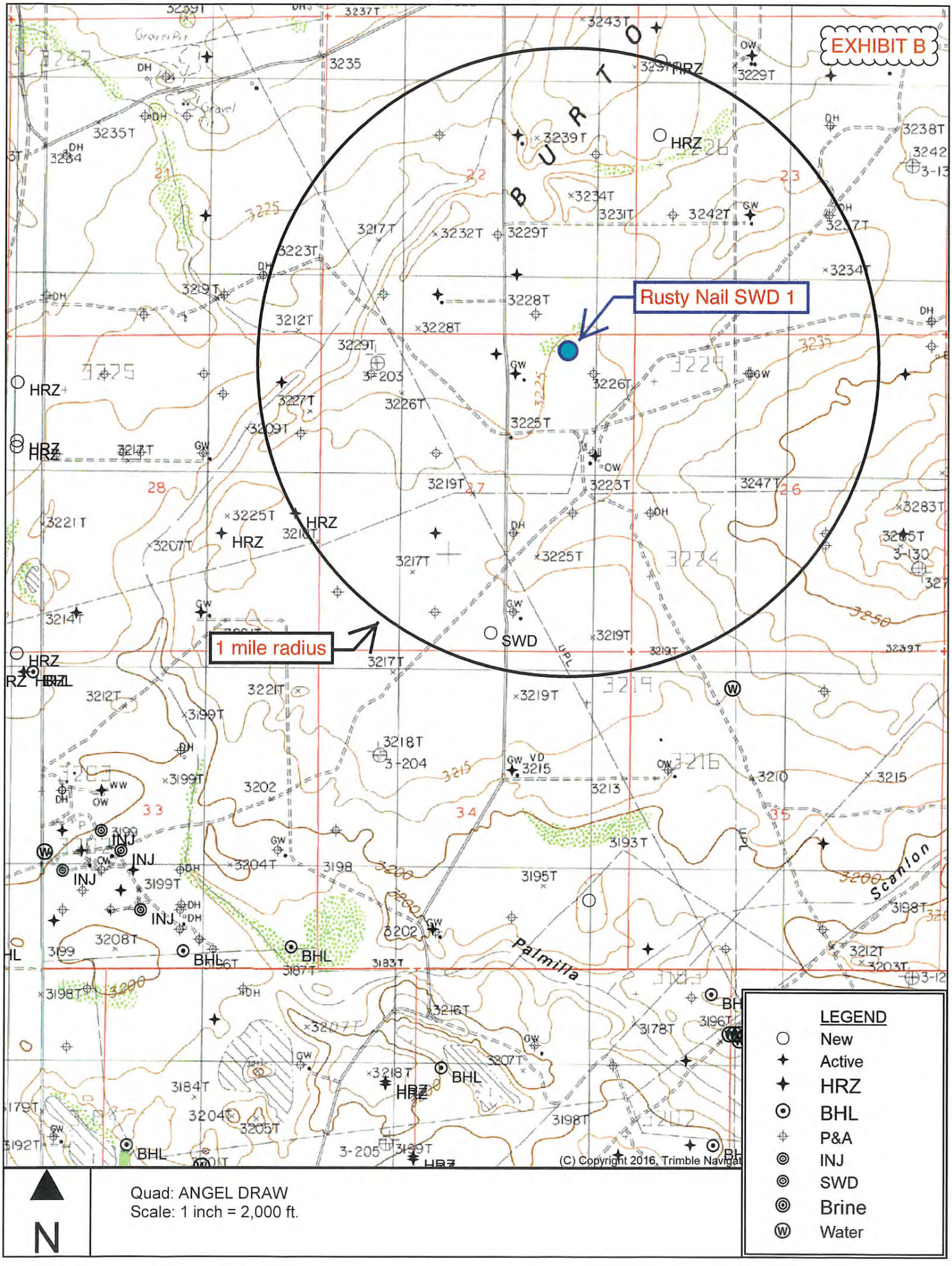


EXHIBIT B
Rusty Nail SWD 1
1 mile radius
BURTO
Palmilla
Scanlon
LEGEND
New
Active
HRZ
BHL
P&A
INJ
SWD
Brine
Water
Quad: ANGEL DRAW
Scale: 1 inch = 2,000 ft.
N
(C) Copyright 2016, Trimble Navigat

SORTED BY DISTANCE FROM RUSTY NAIL SWD 1

API	OPERATOR	WELL	TYPE	UNIT-SECTION-T20S-R28E	TVD	ZONE @ TD	FEET FROM RUSTY NAIL SWD 1
3001502432	Wills	Harrell et al 002	P&A	A-27	833	Yates	569
3001502416	Wills	Fed Union 001	P&A	O-22	904	Yates	842
3001521027	Devon	Burton Flat Deep Unit 011	G	B-27	11500	Barnett	921
3001529359	Nordstrand	Rains 27 001	G	B-27	810	Yates	1189
3001526253	OXY USA	Government W 002	G	O-22	11492	Morrow	1569
3001502651	Wills	Harrell et al 001	P&A	H-27	810	Yates	1708
3001502650	Permex	Harrell 001	O	H-27	736	Yates	1767
3001530674	E G L	Oxy Yates 22 Federal 005	P&A	J-22	817	Yates	2301
3001521067	OXY USA	Government W Com 001	G	N-22	11523	Chester	2379
3001502539	A H Rains	Hondo Fed 001	P&A	I-27	791	Yates	2658
3001524664	Devon Louisiana	Burton Flat Deep Unit 015	P&A	F-27	5600	Bone Spring	2740
3001530595	E G L	Oxy Yates 23 Federal 004	P&A	L-23	820	Yates	2943
3001502428	William B Barnhill	Connelly Fed 001	P&A	L-26	887	Yates	3021
3001502433	Wills	Wright 002	P&A	J-27	901	Yates	3117
3001521304	BHP	Burton Flat Deep Unit 012	P&A	C-26	11475	Morrow	3135
3001502429	Forrest E Levers	Levers Fed 002	P&A	C-26	1062	Seven Rivers	3165

EXHIBIT B

SORTED BY DISTANCE FROM RUSTY NAIL SWD 1

3001529167	OXY USA	OXY 22 Federal 001	P&A	M-22	906	Yates	3242
3001530808	E G L	Oxy Yates 27 Federal 010	P&A	D-27	801	Yates	3316
3001530673	E G L	Oxy Yates 22 Federal 006	P&A	H-22	795	Yates	3361
3001527800	Devon	Burton Flat Deep Unit 041	G	K-27	11400	Barnett	3709
3001521020	OXY USA	Government U Com 001	G	G-22	11600	Chester	3742
3001521242	OXY USA	Government Z Com 001	G	K-23	11485	Chester	3904
3001526402	OXY USA	Government U 002	P&A	F-22	11525	Chester	4230
3001520959	Devon	Burton Flat Deep Unit 008	P&A	O-27	11460	Barnett	4398
3001502435	Collier & Bassett	Miller State 001	P&A	H-28	766	Yates	4695
3001502431	Wills	Wright 001	P&A	N-27	989	Yates	4837
3001534416	COG	Blue Ridge 28 State 001	G	A-28	11600	Chester	4852
3001540518	*Devon*	*Burton Flat Deep Unit 048H*	*O*	*I-28*	*6535*	*Bone Spring*	*5302*

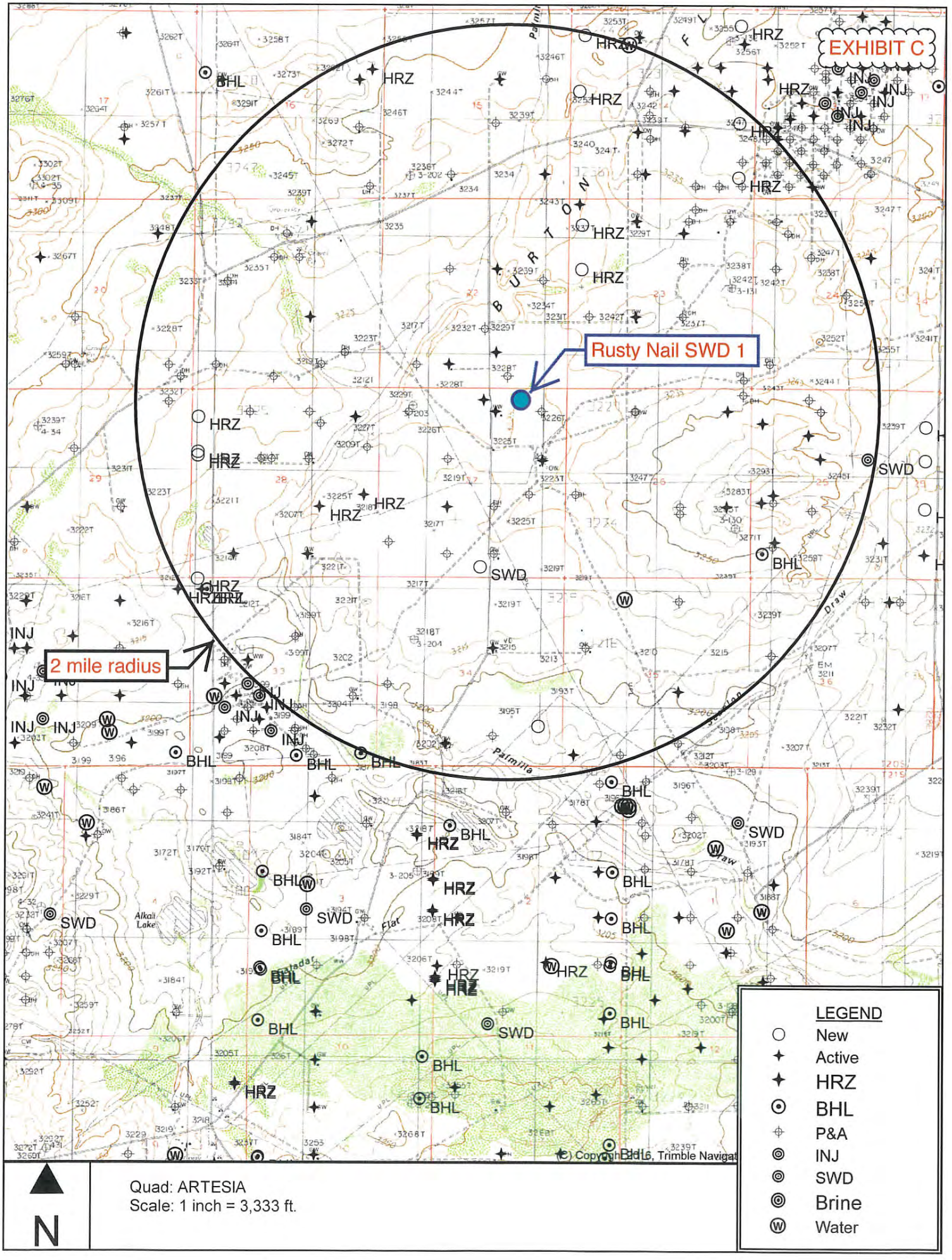
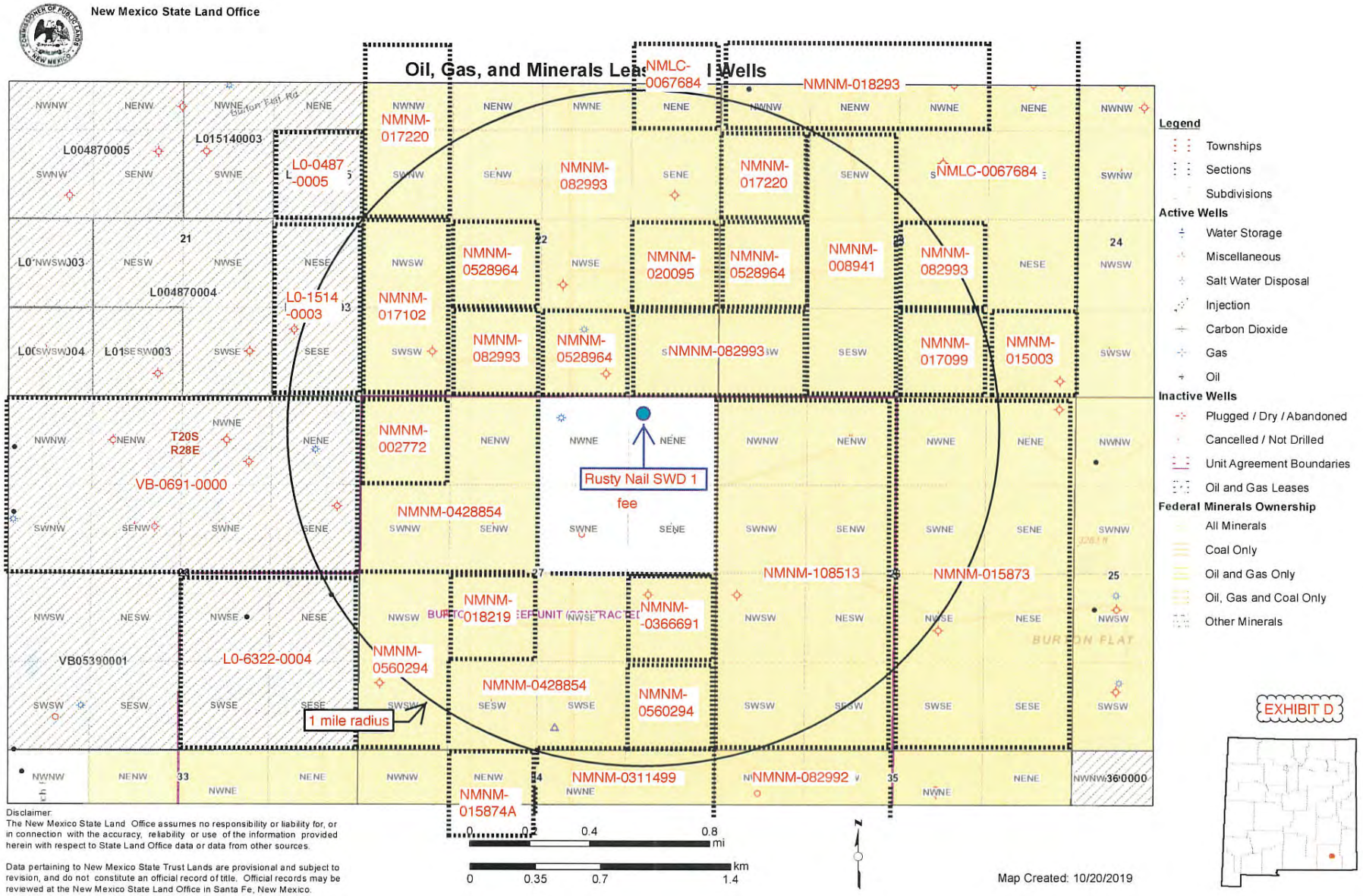


EXHIBIT C
Rusty Nail SWD 1
2 mile radius
LEGEND
New
Active
HRZ
BHL
P&A
INJ
SWD
Brine
Water
Quad: ARTESIA
Scale: 1 inch = 3,333 ft.
N


New Mexico State Land Office
Oil, Gas, and Minerals Leases and Wells
Rusty Nail SWD 1
fee
1 mile radius
T20S
R28E
VB-0691-0000
VB05390001
L0-6322-0004
L0-1514
-0003
L0-0487
-0005
L004870005
L015140003
L004870004
NMLC-0067684
NMNM-018293
NMNM-017220
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NMNM-0528964
NMNM-020095
NMNM-008941
NMNM-017102
NMNM-002772
NMNM-0428854
NMNM-108513
NMNM-015873
NMNM-018219
NMNM-0366691
NMNM-0560294
NMNM-0311499
NMNM-082992
NMNM-015874A
NMNM-017099
NMNM-015003
BURTON FLAT
Legend
Townships
Sections
Subdivisions
Active Wells
Water Storage
Miscellaneous
Salt Water Disposal
Injection
Carbon Dioxide
Gas
Oil
Inactive Wells
Plugged / Dry / Abandoned
Cancelled / Not Drilled
Unit Agreement Boundaries
Oil and Gas Leases
Federal Minerals Ownership
All Minerals
Coal Only
Oil and Gas Only
Oil, Gas and Coal Only
Other Minerals
EXHIBIT D
Map Created: 10/20/2019
Disclaimer:
The New Mexico State Land Office assumes no responsibility or liability for, or in connection with the accuracy, reliability or use of the information provided herein with respect to State Land Office data or data from other sources.
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RUSTY NAIL SWD 1 AREA OF REVIEW LEASES

Aliquot Parts in Area of Review (T. 20 S., R. 28 E.)	Lessor	Lease	Lessee(s) of Record	Well Operators (all shallower than Devonian)
SENE Sec. 21	NMSLO	L0-0487-0005	EOG	Oxy USA WTP
E2SE4 Sec. 21	NMSLO	L0-1514-0003	Magnum Hunter	Vision Energy
NENE Sec. 22	BLM	NMLC-0067684	Oxy USA WTP, Tanos, Devon, Marr, Tighe, Dunigan	Oxy USA WTP
NWNE, NENW, SENW, S2NE4, & NWSE Sec. 22	BLM	NMNM-082993	Oxy USA WTP	Oxy USA WTP
W2NW4 Sec. 22	BLM	NMNM-017220	Oxy USA WTP	Oxy USA WTP
NESE Sec. 22	BLM	NMNM-020095	Oxy USA WTP, Gilmore Truusts, Martin, Hurt, Gilmore Resources, Wheeler	Oxy USA WTP
NESW Sec. 22	BLM	NMNM-0528964	Oxy USA WTP	Oxy USA WTP
W2SW4 Sec. 22	BLM	NMNM-017102	Great Western, Davoil	Oxy USA WTP
SESW Sec. 22	BLM	NMNM-082993	Oxy USA WTP	Oxy USA WTP
SWSE Sec. 22	BLM	NMNM-0528964	Oxy USA WTP	Oxy USA WTP
SESE Sec. 22	BLM	NMNM-082993	Oxy USA WTP	Oxy USA WTP
N2NW4 Sec. 23	BLM	NMNM-018293	Sabinal, Oxy USA WTP, Devon, Tanos	Oxy USA WTP
SWNW Sec. 23	BLM	NMNM-017220	Oxy USA WTP	Oxy USA WTP
SENW & E2SW4 Sec. 23	BLM	NMNM-008941	Oxy USA WTP	Oxy USA WTP
SWNE Sec. 23	BLM	NMLC-0067684	Oxy USA WTP, Tanos, Devon, Marr, Tighe, Dunigan	Oxy USA WTP
NWSE Sec. 23	BLM	NMNM-082993	Oxy USA WTP	Oxy USA WTP
NWSW Sec. 23	BLM	NMNM-0528964	Oxy USA WTP	Oxy USA WTP
SWSW Sec. 23	BLM	NMNM-082993	Oxy USA WTP	Oxy USA WTP
SWSE Sec. 23	BLM	NMNM-017099	Oxy USA WTP	Oxy USA WTP
SESE Sec. 23	BLM	NMNM-015003	Oxy USA WTP	Oxy USA WTP
NE4 & W2SE4 Sec. 26	BLM	NMNM-015873	Colgate	Colgate, Mewbourne
W2 Sec. 26	BLM	NMNM-108513	Devon	N/A
NE4 Sec. 27	fee	Burton Flat Deep Unit, Harrell, & Rains	Devon, Permex	Devon, Permex
E2NW4 & SWNW Sec. 27	BLM	NMNM-0428854	Devon	Devon

EXHIBIT D

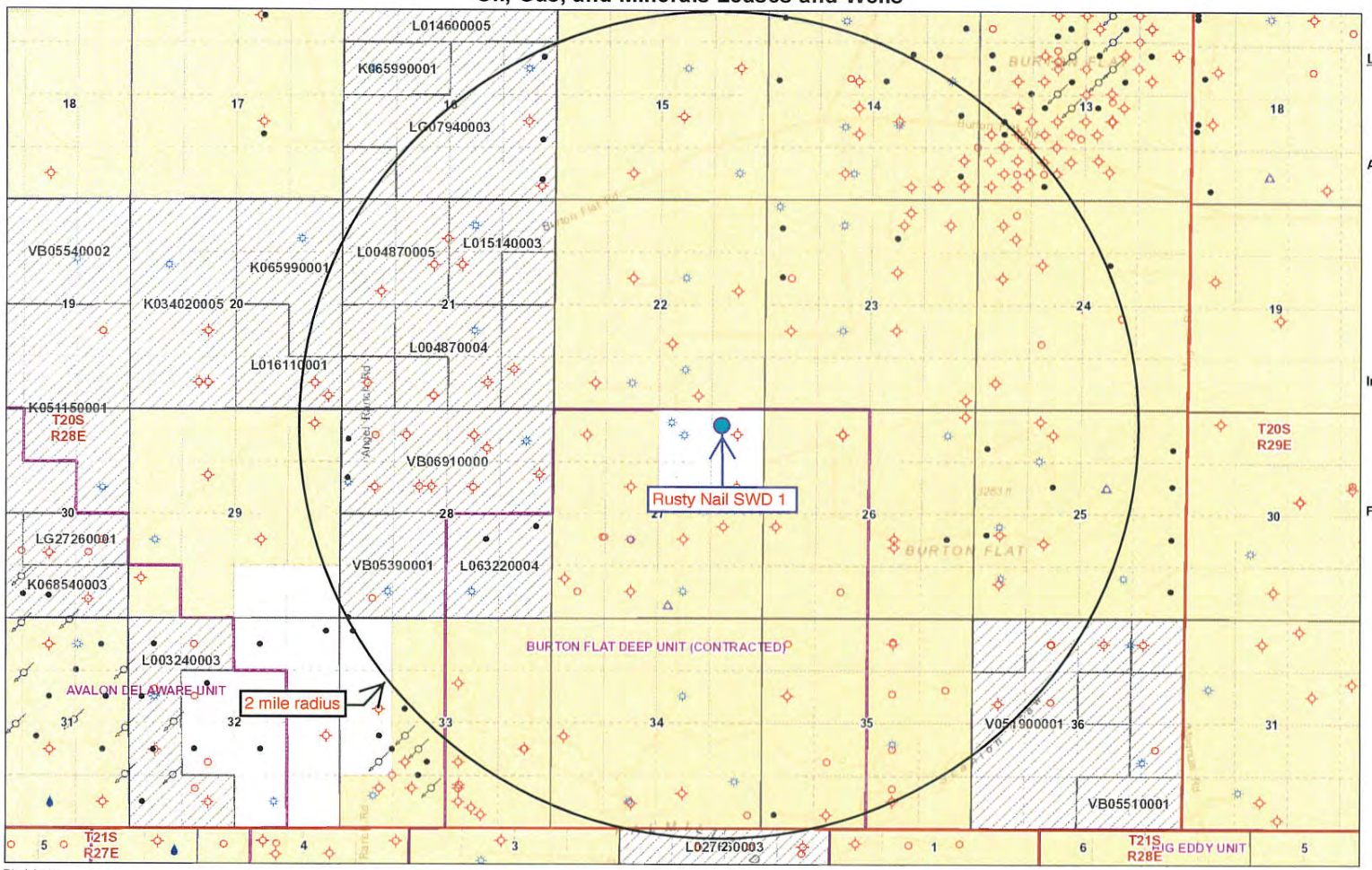
RUSTY NAIL SWD 1 AREA OF REVIEW LEASES

NWNW Sec. 27	BLM	NMNM-002772	Great Western, Davoil	Devon
NESE Sec. 27	BLM	NMNM-0366691	Kerr-McGee (Anadarko, Oxy)	Devon
NWSE, SESW, & SWSE Sec. 27	BLM	NMNM-0428854	Devon	Devon
NESW Sec. 27	BLM	NMNM-018219	Antelope, Johnston, Wheeler, Hurt, Hurt Properties, Gilmore Resources, Martin	Devon
W2SW4 Sec. 27	BLM	NMNM-0560294	Devon	Devon
SESE Sec. 27	BLM	NMNM-0560294	Devon	Devon
E2NE4 Sec. 28	NMSLO	VB-0691-0000	COG	COG
NESE Sec. 28	NMSLO	L0-6322-0004	Ocean Permian	Devon
NENW Sec. 34	BLM	NMNM-015874A	Devon	Devon
N2NE4 Sec. 34	BLM	NMNM-0311499	Sabinal, Devon	Devon
NWNW Sec. 35	BLM	NMNM-082992	Devon	N/A

EXHIBIT D

New Mexico State Land Office

Oil, Gas, and Minerals Leases and Wells



Legend

- Townships
- Sections
- Subdivisions

Active Wells

- Water Storage
- Miscellaneous
- Salt Water Disposal
- Injection
- Carbon Dioxide
- Gas
- Oil

Inactive Wells

- Plugged / Dry / Abandoned
- Cancelled / Not Drilled
- Unit Agreement Boundaries
- Oil and Gas Leases

Federal Minerals Ownership

- All Minerals
- Coal Only
- Oil and Gas Only
- Oil, Gas and Coal Only
- Other Minerals

EXHIBIT E

Disclaimer:
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0 0.4 0.8 1.6 mi

0 0.5 1 2 km

N

Map Created: 10/20/2019

T. 20 S., R. 28 E. WATER SAMPLES (parameters in mg/l)

API	Section	UL	Formation	TDS	Sodium	Calcium	Iron	Magesium	Chloride	Bicarbonate	Sulfate
3001502406	19	E	Artesia	3211					130	98	2124
3001502419	23	A	Artesia	25500					11500	716	4590
3001502352	13	L	Artesia	50610					29400	861	1428
3001502395	13	F	Artesia	28980					14640	660	3080
3001502335	1	G	Artesia	32300					14800	1430	5450
3001502356	13	O	Artesia	81000					45500	684	4130
3001502361	13	O	Artesia	29100					14400	658	3620
3001502381	13	C	Artesia	40200					17400	1120	8470
3001502390	13	F	Artesia	24308					12310	884	2381
3001502353	13	J	Artesia	38600					17600	756	7230
3001502390	13	F	Artesia	27048					13330	894	2969
3001521640	29	J	Bone Spring	131898	46844	6407	5	1395	85954	635	2419
3001521640	29	J	Bone Spring	142444	45650	10949	5	1821	93828	679	1879
3001527288	4	P	Bone Spring	1595	1286	8	127	1	65	93	5
3001527288	4	P	Bone Spring	6038	2218	26	36	6	3352	221	142
3001540518	28	I	Bone Spring 1st	185448	61572	1308	9	344	119363	683	680
3001540517	28	J	Bone Spring 1st	192410	72267	1344	18	367	114048	2074	0
3001540518	28	I	Bone Spring 1st	197409	76634	1421	24	397	114243	2196	0
3001540517	28	J	Bone Spring 1st	184770	71077	1425	18	391	108741	720	0
3001540518	28	I	Bone Spring 1st	187017	72901	1420	15	392	109200	695	0
3001502406	19	E	Capitan	22198					11170	274	2692
3001502406	19	E	Capitan	22205	6502	1001		559	11176	274	2692
3001527070	24	G	Delaware	7792	496	1384	815	176	4767	93	31
3001524414	30	O	Delaware	110018	67321	1064	0	566	105500	1320	1368
3001524710	30	F	Delaware	131032	75440	1400	0	2600	125000	456	1320
3001524414	30	O	Delaware	113918	66125	1420	0	1880	108500	358	1600
3001524546	30	M	Delaware	100084	56097	2440	0	3660	100500	460	792
3001524637	30	L	Delaware	123556	71737	1840	0	1860	118000	392	1128
3001522235	19	N	Delaware	37852	74405	2120	17	4280	130000	228	1152
3001524637	30	L	Delaware	161114	53113	11872	19	2363	109216	692	1151

EXHIBIT F

T. 20 S., R. 28 E. WATER SAMPLES (parameters in mg/l)

API	Section	UL	Formation	TDS	Sodium	Calcium	Iron	Magesium	Chloride	Bicarbonate	Sulfate
3001527070	24	G	Delaware	32129	5253	4235	1123	1028	20380	110	159
3001522235	19	N	Delaware			1600	100	5126	41535	122	25
3001522002	19	N	Morrow			11000	9	1100	81792	122	1425
3001529234	16	H	Morrow	31643	11186	919	105	160	19505	273	87
3001528996	3	A	Morrow	44978	15978	1345	198	252	27888	467	31
3001521222	18	F	Morrow	36642		1120	0	1555	23004	183	13
3001522002	19	N	Morrow			10360	38	638	94572	122	1375
3001502406	19	E	Rustler	3735	581	571		230	130	98	2124
3001502416	22	O	San Andres	210774					123500	847	4512
3001522554	30	H	Strawn			1000	85	244	11502	122	3
3001502406	19	E	Tansill	3237		228		56	130	120	2122
3001502406	19	E	Tansill	3728	580	570		230	130	98	2120
3001502406	19	E	Tansill		581	228		56	130	120	2122
3001522299	21	J	Wolfcamp	41597					25000	449	76
3001522299	21	J	Wolfcamp	43441					26100	446	100
3001502416	22	O	Wolfcamp	55965					32400	252	2260
3001522299	21	J	Wolfcamp	40785					24300	688	44
3001522299	21	J	Wolfcamp	144926					87600	37	1350
3001502416	22	O	Wolfcamp	297557					186000	143	447

EXHIBIT F

EXHIBIT G

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	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Twn	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
CP 01589 POD1		CP	ED	1	2	1	35	20S	28E	579674	3600121	1903	109	70	39
CP 00920 POD1		CP	ED	2	4	1	33	20S	28E	576627	3599766*	2983	47	29	18
CP 00923 POD1		CP	ED	2	4	1	33	20S	28E	576627	3599766*	2983	57		
CP 00525		CP	ED	3	2	1	14	20S	28E	579656	3604847*	3153	171	140	31

Average Depth to Water: **79 feet**
Minimum Depth: **29 feet**
Maximum Depth: **140 feet**

Record Count: 4

UTMNAD83 Radius Search (in meters):

Easting (X): 578798 **Northing (Y):** 3601812 **Radius:** 3220

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

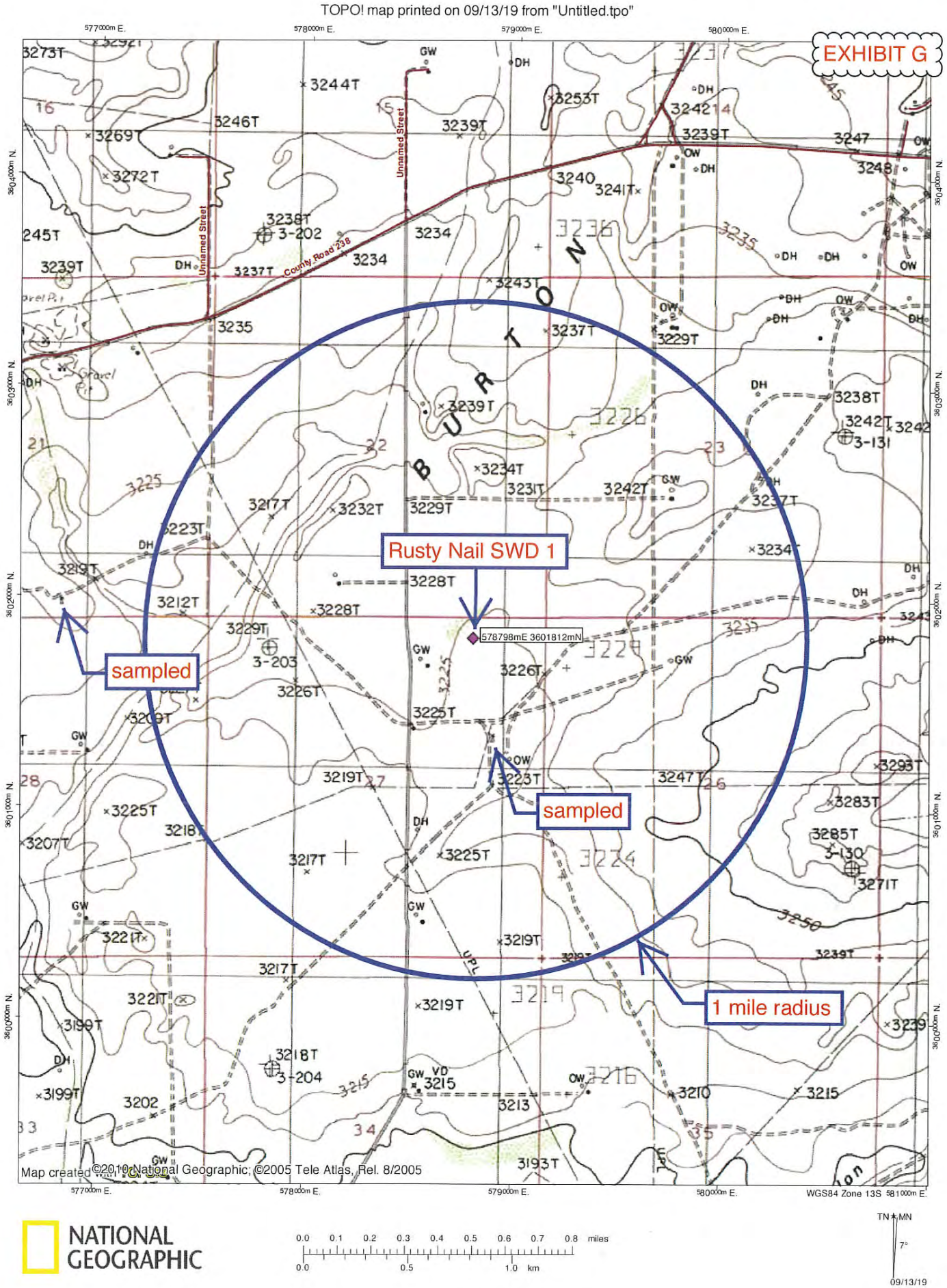

TOPO! map printed on 09/13/19 from "Untitled.tpo"
EXHIBIT G
Rusty Nail SWD 1
578798mE 3601812mN
sampled
sampled
1 mile radius
Unnamed Street
Unnamed Street
County Road 238
BURTON
Map created with TOPO!
©2010 National Geographic, ©2005 Tele Atlas, Rel. 8/2005
WGS84 Zone 13S
NATIONAL GEOGRAPHIC
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 miles
0.0 0.5 1.0 km
TN MN
7°
09/13/19

EXHIBIT G

Analytical Re
Lab Order **1909F51**

Hall Environmental Analysis Laboratory, Inc.

Date Reported: **10/21/2019**

CLIENT: Permits West
Project: PWS Rusty Nail SWD 1
Lab ID: 1909F51-001 **Matrix:** AQUEOUS

Client Sample ID: Windmill/Trough #3-32.55256
Collection Date: 9/24/2019 12:30:00 PM
Received Date: 9/26/2019 11:22:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 1664B						Analyst: **KMN**	
N-Hexane Extractable Material	ND	9.25		mg/L	1	10/1/2019 5:07:00 PM	47810
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	760	50	*	mg/L	100	10/10/2019 5:24:18 PM	R63597
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **JMT**	
Total Dissolved Solids	5380	20.0	*	mg/L	1	10/2/2019 7:43:00 AM	47824

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

EXHIBIT G

Analytical Re
Lab Order **1909F51**
Date Reported: **10/21/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Permits West
Project: PWS Rusty Nail SWD 1
Lab ID: 1909F51-002 **Matrix:** AQUEOUS

Client Sample ID: Windmill/Trough #2-32.54699
Collection Date: 9/24/2019 1:50:00 PM
Received Date: 9/26/2019 11:22:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 1664B						Analyst: **KMN**	
N-Hexane Extractable Material	ND	9.20		mg/L	1	10/1/2019 5:07:00 PM	47810
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	400	50	*	mg/L	100	10/10/2019 5:37:11 PM	R63597
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **JMT**	
Total Dissolved Solids	3880	20.0	*	mg/L	1	10/2/2019 7:43:00 AM	47824

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

EXHIBIT G

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1909F51

21-Oct-19

Client: Permits West

Project: PWS Rusty Nail SWD 1

Sample ID: **MB-47810**	SampType: **MBLK**	TestCode: **EPA Method 1664B**							
Client ID: **PBW**	Batch ID: **47810**	RunNo: **63378**							
Prep Date: **9/30/2019**	Analysis Date: **10/1/2019**	SeqNo: **2164392**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
N-Hexane Extractable Material	ND	10.0								

Sample ID: **LCS-47810**	SampType: **LCS**	TestCode: **EPA Method 1664B**							
Client ID: **LCSW**	Batch ID: **47810**	RunNo: **63378**							
Prep Date: **9/30/2019**	Analysis Date: **10/1/2019**	SeqNo: **2164393**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
N-Hexane Extractable Material	38.8	10.0	40.00	0	97.0	78	114			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

EXHIBIT G

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1909F51

21-Oct-19

Client: Permits West

Project: PWS Rusty Nail SWD 1

Sample ID: **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R63597**	RunNo: **63597**
Prep Date:	Analysis Date: **10/10/2019**	SeqNo: **2172771** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID: **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R63597**	RunNo: **63597**
Prep Date:	Analysis Date: **10/10/2019**	SeqNo: **2172772** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.9	0.50	5.000	0	97.4	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

EXHIBIT G

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1909F51

21-Oct-19

Client: Permits West

Project: PWS Rusty Nail SWD 1

Sample ID: **MB-47824**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **47824**	RunNo: **63351**
Prep Date: **9/30/2019**	Analysis Date: **10/2/2019**	SeqNo: **2162583** Units: **mg/L**

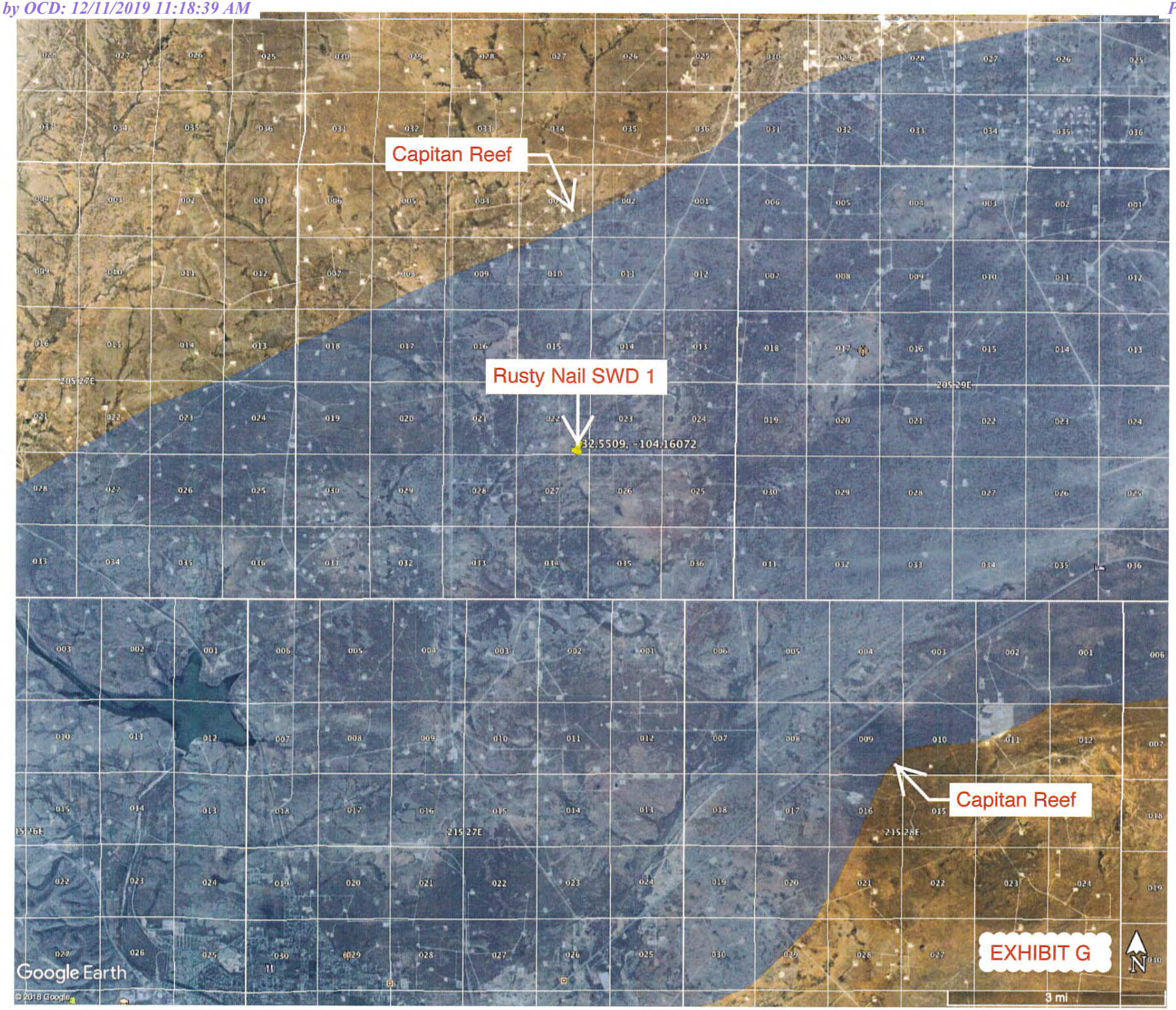
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID: **LCS-47824**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **47824**	RunNo: **63351**
Prep Date: **9/30/2019**	Analysis Date: **10/2/2019**	SeqNo: **2162584** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1020	20.0	1000	0	102	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit


Capitan Reef
Rusty Nail SWD 1
32.5509, -104.16072
Capitan Reef
EXHIBIT G
Google Earth
© 2018 Google
3 mi
N

PERMITS WEST, INC.
PROVIDING PERMITS for LAND USERS
37 Verano Loop, Santa Fe, New Mexico 87508 (505) 466-8120

EXHIBIT H

Seismic Risk Assessment

Permian Water Solutions, LLC

Rusty Nail SWD No. 1

Section 27, Township 20 South, Range 28 East

Eddy County, New Mexico

Cory Walk

Cory Walk

B.S., M.S.

Geologist

Permits West Inc.

November 15, 2019

EXHIBIT H

GENERAL INFORMATION

Rusty Nail SWD #1 is located in the NE 1/4, section 27, T20S, R28E, about 10 miles north of Carlsbad, NM in the Permian Basin. Permian Water Solutions proposes the injection zone to be within the Devonian formation through an open hole from 12,300'-13,500' below ground surface. This report assesses any potential concerns relating to induced seismicity along deep penetrating Precambrian faults or the connection between the injection zone and known underground potable water sources.

SEISMIC RISK ASSESSMENT

Historical Seismicity

Searching the USGS earthquake catalog resulted in no (0) earthquakes above a magnitude 2.5 within 6 miles (9.7 km) of the proposed deep disposal site since 1970 (Fig 1). The nearest earthquake occurred in 1974 about 16.5 miles (~26.5 km) south of the proposed Rusty Nail SWD site and had a magnitude of 3.9.

Basement Faults and Subsurface Conditions

A structure contour map (Fig. 1) of the Precambrian basement shows the Rusty Nail SWD #1 is approximately 16 miles from the nearest basement-penetrating fault inferred by Ewing et al (1990). **Information about nearby faults based on GIS data from Ruppel et al. (2009) is listed in Table 1.**

Snee and Zoback (2018) state, "In the western part of Eddy County, New Mexico, S_{Hmax} is ~north-south (consistent with the state of stress in the Rio Grande Rift; Zoback and Zoback, 1980) but rotates to ~east-northeast-west-southwest in southern Lea County, New Mexico and the northernmost parts of Culberson and Reeves counties, Texas." **Around the Rusty Nail SWD site, Snee and Zoback indicate a S_{Hmax} direction of N010°E and an A_{φ} of 0.57, indicating an extensional (normal) stress regime.**

Induced seismicity is a growing concern of deep SWD wells. Relatively new software developed by the Stanford Center for Induced and Triggered Seismicity allows for the probabilistic screening of deeply penetrating faults near the proposed injection zone (Walsh et al., 2016; Walsh et al., 2017). This software uses parameters such as stress orientations, fault strike/dip, injection rates, fault friction coefficients, etc. to estimate the potential for fault slip. Using the best available data as input parameters (Table 2), the Fault Slip Potential (FSP) models suggest an eight (0.08) percent chance of slip on a nearby fault, inferred by Frenzel et al (1988) and Ewing et al. (1990), through the year 2040 (Fig 2; Table 1). **This model also suggests a pore pressure increase of 0.07 psi on the nearest fault (Fault 2; Fig. 3; Table 1) by the year 2042.** Geomechanical modeling shows that the primary fault of concern (fault 24) would need a pressure increase of 1640 psi in order to reach a 100% probability of slip on the fault. Even a 50% probability requires an increase of 438 psi which is far greater than the modeled increase of 0.18 psi.

EXHIBIT H

GROUNDWATER SOURCES

Quaternary Alluvium acts as the principal aquifer used for potable ground water near the Rusty Nail SWD #1 location (Hendrickson and Jones, 1952). Nicholson and Clebsch (1961) state, "Potable ground water is not available below the Permian and Triassic unconformity but, because this boundary is not easily defined, the top of the Rustler anhydrite formation is regarded as the effective lower limit of 'potable' ground water." Around the Rusty Nail SWD #1, the top of a thick anhydrite unit interpreted to represent the Rustler Formation lies at a depth of ~350 feet bgs.

STRATIGRAPHY

Thick permeability barriers exist above (Woodford shale; 60 ft thick) and below (Simpson Group; 115 ft thick) the targeted Devonian injection zone (Plate 2, Comer et al., 1991; Fig. 8, Frenzel et al., 1988). Well data indicates ~11,950 ft of rock separating the top of the Devonian from the previously stated lower limit of potable water at the top of the Rustler anhydrite formation.

CONCLUDING STATEMENT

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

EXHIBIT H

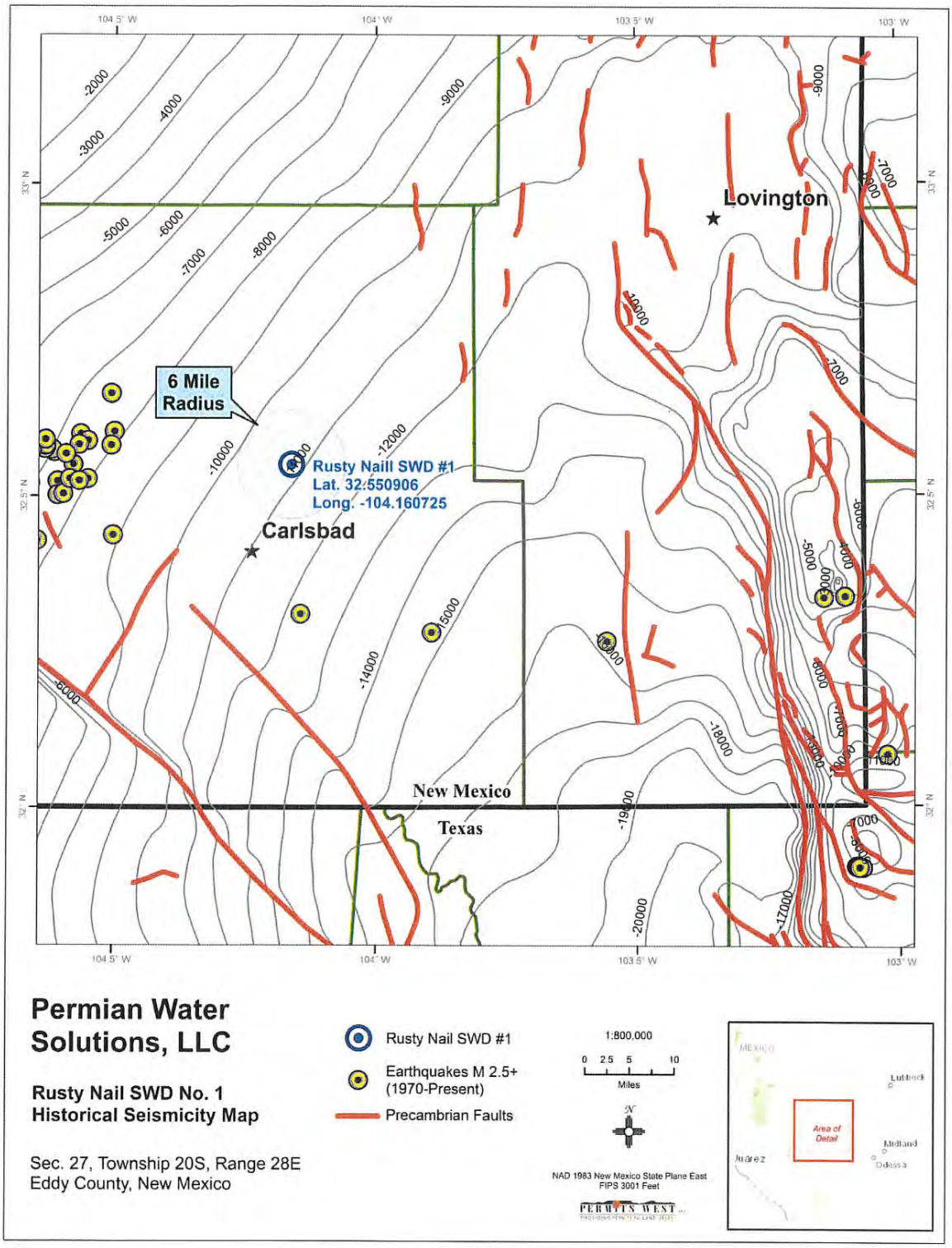


Figure 1. Structural contour map of the Precambrian basement in feet below sea level. Red lines represent the locations of Precambrian basement-penetrating faults (Ewing et al., 1990). The Rusty Nail SWD #1 well lies ~16 miles NE of the closest deeply penetrating fault and ~16.5 miles from the closest historic earthquake.

EXHIBIT H

Table 1: Nearby Basement Fault Information

ID	Distance from proposed Rusty Nail SWD (mi)	Strike (°)	Dip (°)	FSP	Pore Pressure change after 20 years (psi)
Fault 2	16.0	24	50-90	0.06	0.07
Fault 3	19.2	140	50-90	0.00	0.07
Fault 24	21.3	170	50-90	0.08	0.18

Table 2: Fault Slip Potential model input parameters

Faults	Value	Notes
Friction Coefficient	0.58	Ikari et al. (2011)
Dip Angle (deg)	70	Snee and Zoback (2018)
Stress		
Vertical stress gradient (psi/ft)	1.1	Hurd and Zoback (2012)
Max Horizontal Stress Direction (deg)	10	Snee and Zoback (2018)
Depth for calculations (ft)	13500	Proposed injection zone
Initial Reservoir Pressure Gradient (psi/ft)	0.7	calculated from mud wt (ppg) used in drilling at these depths
A Phi Parameter	0.57	Snee and Zoback (2018)
Reference Friction Coefficient	0.58	Ikari et al. (2011)
Hydrology		
Aquifer thickness (ft)	1200	Proposed injection zone
Porosity (%)	6	
Permeability (mD)	150	
Injection Rate (bbl/day)	30000	Maximum proposed injection rate

EXHIBIT H

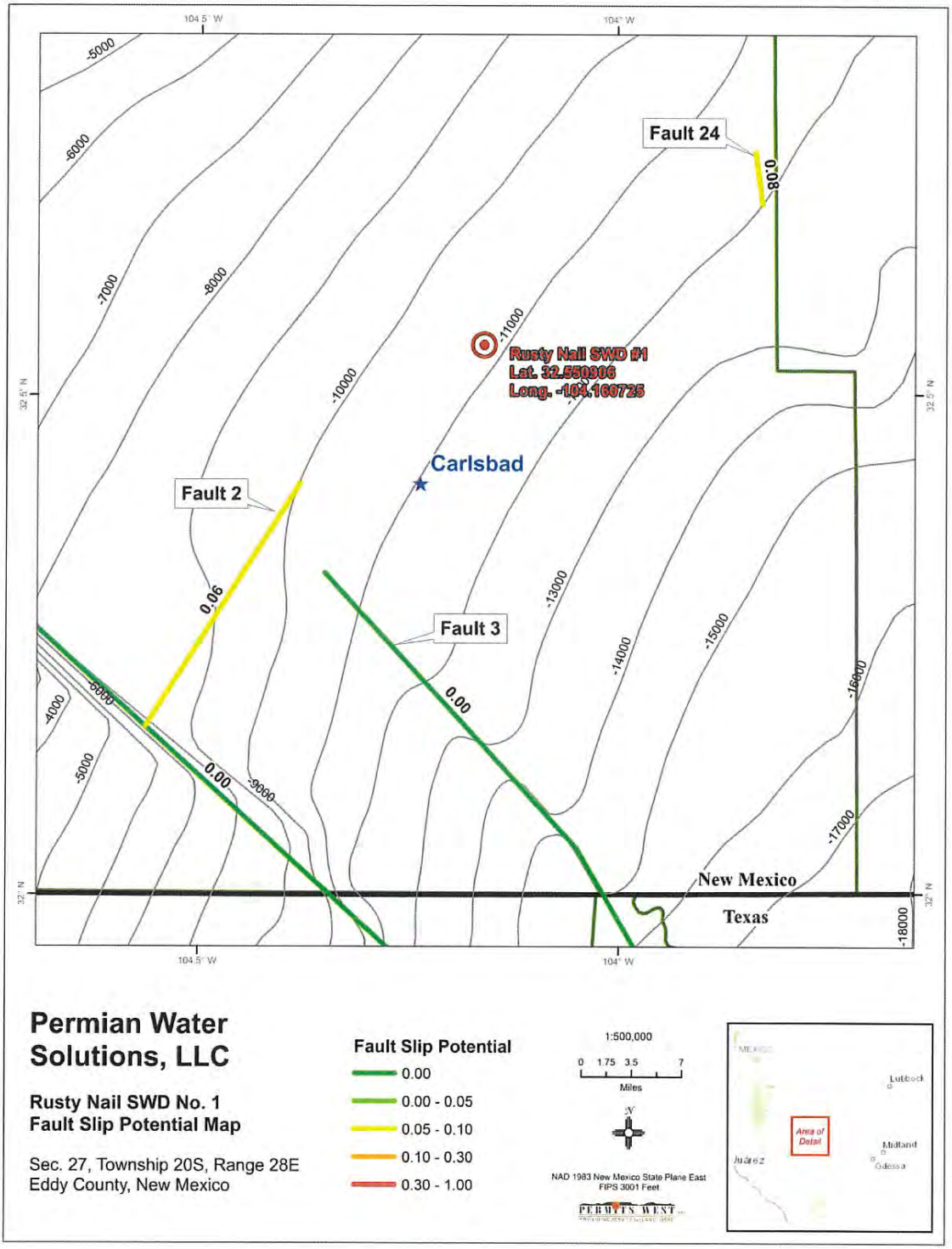


Figure 2. Precambrian fault map of Carlsbad, NM area as mapped by Ewing et al. (1990). Faults are colored based on probability of fault slip as modeled using Fault Slip Potential software (Walsh and Zoback, 2016). Labeled values represent the calculated fault slip potential using the parameters indicated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

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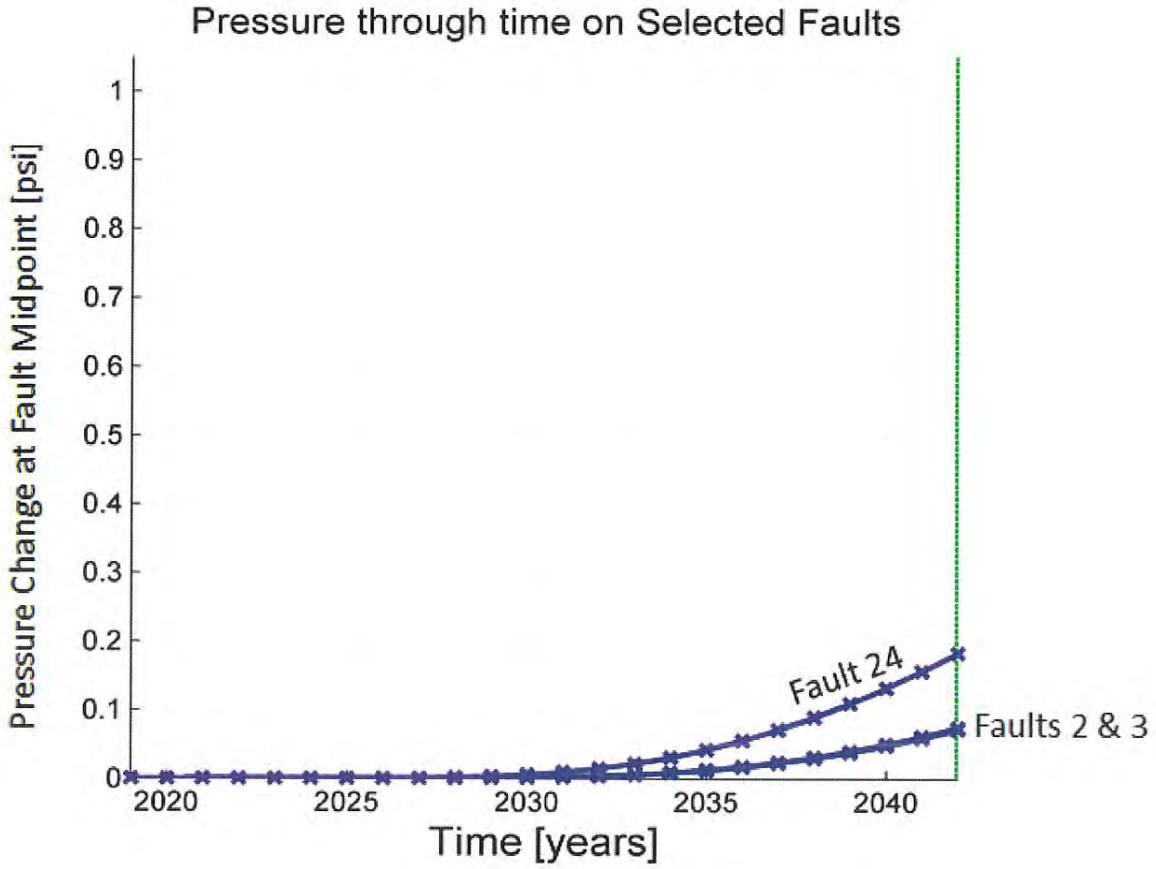

Figure 3. Scatter plot showing the modeled change of pore pressure on faults 2, 3 and 24 through time as a response to the proposed SWD well.

EXHIBIT H

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Zoback, M. L., and M. D. Zoback, 1980, State of stress in the conterminous United States: Journal of Geophysical Research, 85, no. B11, 6113–6156, https://doi.org/10.1029/JB085iB11p06113.

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EXHIBIT I

Affidavit of Publication

Ad # 0003907969

F. /
37 VERANO LOOP

SANTA FE, NM 87508

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

November 19, 2019

Legal Clerk

Subscribed and sworn before me this November 19, 2019:

State of WI, County of Brown
NOTARY PUBLIC

8-25-23
My commission expires

SHELLY HORA
Notary Public
State of Wisconsin

Permian Water Solutions, LLC will apply to drill the Rusty Nail SWD 1 as a salt-water disposal well. The well will dispose into the Devonian formation from 12,300' to 13,500'. It is 10 miles northeast of Carlsbad, NM at 333' FNL & 1144' FEL Sec. 27, T. 20 S., R. 28 E., Eddy County, NM. Maximum disposal rate will be 30,000 bwpd. Maximum injection pressure will be 2,460 psi. Interested parties must file objections or requests for hearing with the NM Oil Conservation Division, 1220 South Saint Francis Dr., Santa Fe, NM 87505 within 15 days. Additional information can be obtained by contacting: Brian Wood, Permits West, Inc., 37 Verano Loop, Santa Fe, NM 87508. Phone number is (505) 466-8120.
3907969, Current-Argus,
Nov. 19, 2019

Ad # 0003907969
PO #: Permian Water Solutions
# of Affidavits : 1

PERMITS WEST, INC.
PROVIDING PERMITS for LAND USERS
37 Verano Loop, Santa Fe, New Mexico 87508 (505) 466-8120

EXHIBIT J

December 9, 2019

Harley & Carol Ballard
PO Box JJ
Carlsbad NM 88221

TYPICAL NOTICE

Permian Water Solutions, LLC is applying (see attached application) to drill its Rusty Nail SWD 1 well as a saltwater disposal well. As required by NM Oil Conservation Division (NMOCD) rules, I am notifying you of the following proposed saltwater disposal well. This letter is a notice only. No action is needed unless you have questions or objections.

Well Name: Rusty Nail SWD 1 (fee lease) TD = 13,500'
Proposed Disposal Zone: Devonian (12,300' - 13,500')
Location: 333' FNL & 1144' FEL Sec. 27, T. 20 S., R. 28 E., Eddy County, NM
Approximate Location: 10 air miles northeast of Carlsbad, NM
Applicant Name: Permian Water Solutions, LLC (432) 305-4124
Applicant's Address: 600 Travis St., Suite 4700, Houston TX 77002

Submittal Information: Application for a saltwater disposal well will be filed with the NMOCD. If you have an objection, or wish to request a hearing, then it must be filed with the NMOCD within 15 days of receipt of this letter. NMOCD address is 1220 South St. Francis Dr., Santa Fe, NM 87505. Their phone number is (505) 476-3440.

Please call me if you have any questions.

Sincerely,

Brian Wood

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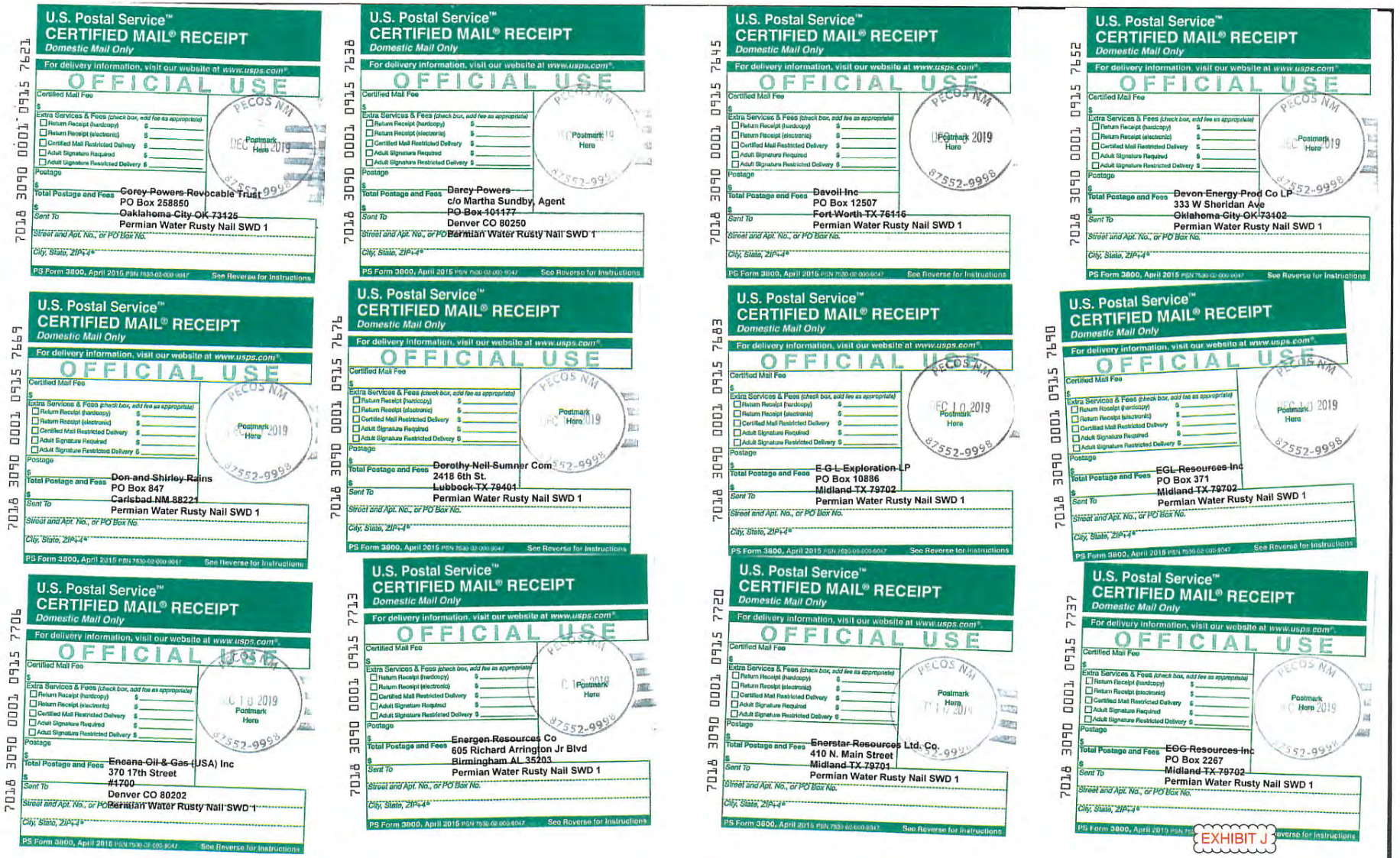

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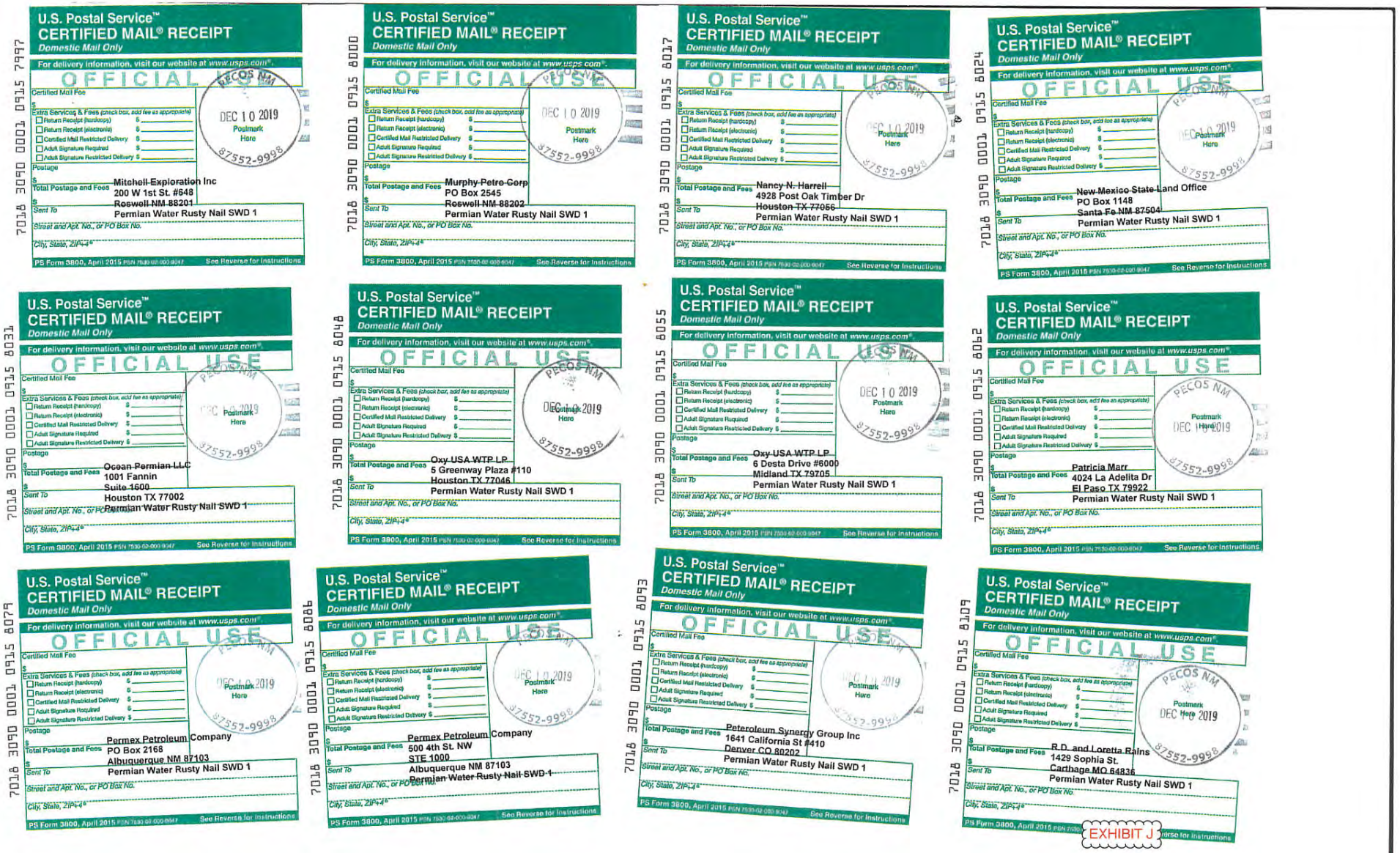
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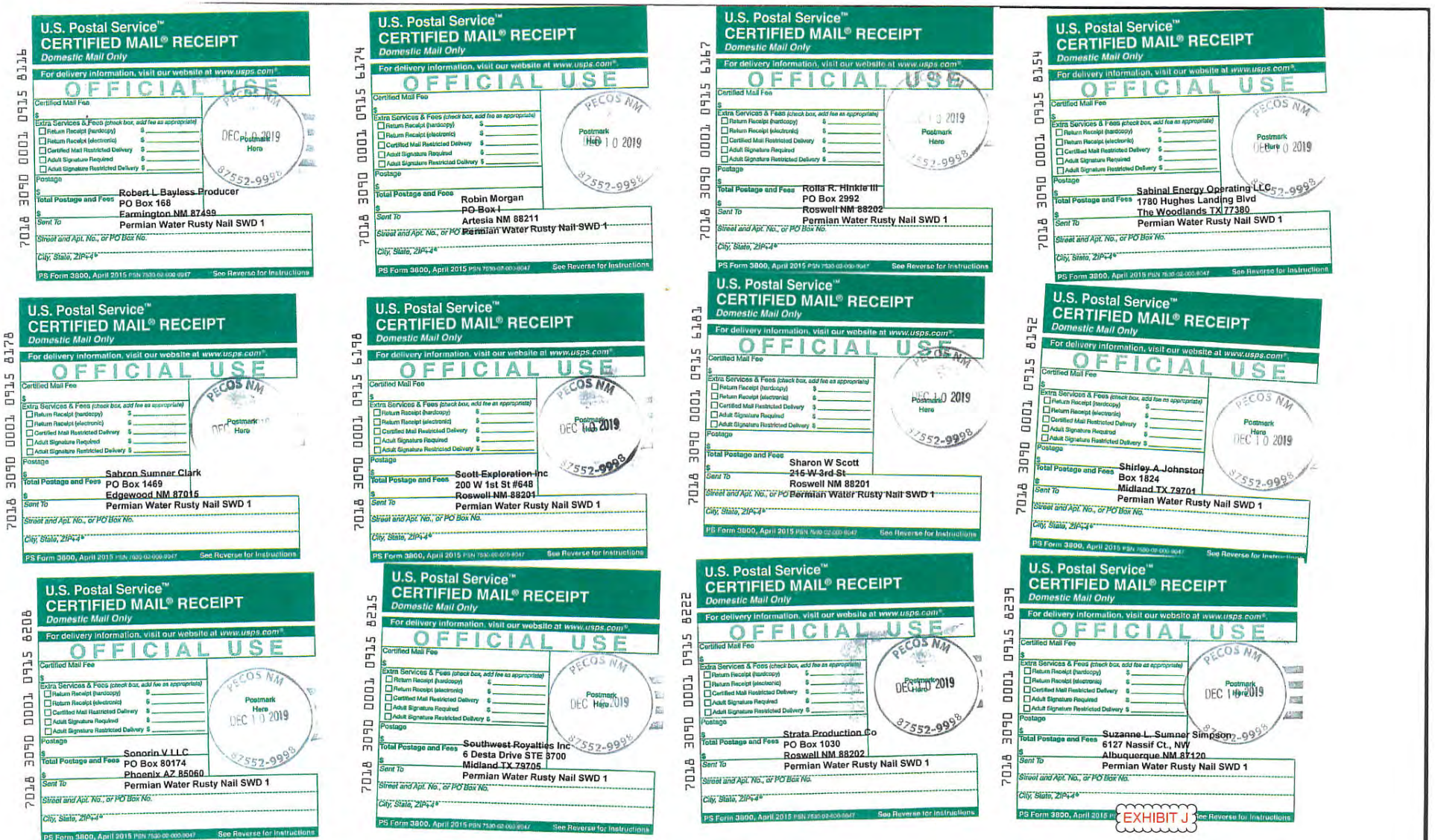

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Permian Water Rusty Nail SWD 1

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Sahron Sumner Clark
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The Katherine E Gilmore
Bypass Trust
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980 Caughlin Crossing #102
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EXHIBIT J